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THE
CYCLOPÆDIA;
OR,
Universal Dictionary
OF
ARTS, SCIENCES, AND LITERATURE.

VOL. XXXIX.

THE
CYCLOPEDIA

OF THE
ARTS AND SCIENCES

OF GREAT BRITAIN AND IRELAND

IN FIFTEEN VOLUMES

THE
CYCLOPÆDIA;

OR,

UNIVERSAL DICTIONARY

OF

Arts, Sciences, and Literature.

BY

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

WITH THE ASSISTANCE OF
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ARTS and SCIENCES.

X

X

X, A double consonant, and the twenty-second letter in the English alphabet; which, however, begins no English word.

The *x* of the Latins, and ξ of the Greeks, are compounded of *c s*, and $\kappa \sigma$; whence, to this day, the letter *x* in the English and French has the same found with *c s*, or *k s*. Thus we pronounce *Alexander* exactly as if written *Alecfsander* or *Aleksfsander*.

The Italians have no *x* at all in their language, but both speak and write *Alessandro*. The Spaniards pronounce the *x* like our *c* before *a*; viz. *Alexandro*, as if it were *Alecandro*. The Portuguese pronounce it like *sh*.

In foreign words, used in English, we sometimes soften the *x* into a double *c*; as *Brussels*, for *Bruxelles*, &c.

The letter is not known in the Hebrew, or other oriental languages; but in lieu of it, they write the two simple letters of which it is compounded. And the like do the modern Germans.

Peter Diaconus relates, that the letter X was introduced into the Roman alphabet in the time of Augustus; and that, before his reign, the Romans supplied the want of it by the letters C and S. But Mr. Asle observes, that this is a mistake; the letter X being found in the Duilean pillar, inscribed in the year of Rome 494, and 259 before Christ. Origin and Progress of Writing, p. 78.

X is also a numeral letter, and signifies ten; as represent- ing two V's placed one at top of the other. See V.

X *Supra denos numero tibi dat retinendos.*

When laid flat, thus X, it signifies a thousand; and when a dash is added over it, X̄, it signifies ten thousand. I before X denotes the subtraction, and after X the addition of unit: thus, IX = 9, and XI = 11. X before L or C

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denotes the subtraction of 10 from 50, or 100: thus, XL = 40, and XC = 90.

X on the French coins denotes those struck at Amiens.

We often meet with the Greek letters X and P joined in this manner XP on ancient medals. The first we find are on some large brats coins of the Ptolemies, kings of Egypt, where it was placed on a civil account.

Some writers have taken it for a date, and others for the initial letters of a proper name; but as no reasons are assigned for either of those conjectures, Mr. Ward rather supposes it an abbreviation of the word XPHMA, money, impressed on those pieces, to denote their currency as money; which might be thought proper, as they have not the heads of kings stamped upon them, like their silver and gold coins; but always that of a Jupiter on the front, and an eagle perched on a thunderbolt on the reverse.

This character was afterwards applied to a very different purpose by Constantine the Great, who made use of it to denote XPICOC, both in his coins and military ensigns; in which he was followed not only by some succeeding emperors, but also by private persons, who out of devotion put it on their lamps and other utensils.

It afterwards came to be used merely as a critical note, to point out remarkable passages in manuscripts; and then it stood for the initials of XPICIMON, useful; as we learn from Isidore, Orig. lib. i. cap. 20. See Phil. Trans. N^o 474. sect. 1.

X, with a P, or Greek R, in the middle of it, is also the monogram of the name of CHRIST, which constantly occurs in the catacombs or burial-places of the ancient Christians, and which was the chief ornament of the Labarum or military standard of Constantine, and the succeeding emperors. See LABARUM.

B

XABEA,

XABEA, in *Geography*, a sea-port of Spain, in the province of Valencia, near the coast of the Mediterranean; 38 miles N.N.E. of Alicante.

XABOLECTORA, in *Ancient Geography*, a name given by P. Mela to Aborras, a river of Mesopotamia.

XACA, in *Geography*. See **JACA**.

XACRE, a cape on the fourth-east coast of the island of Candia; 18 miles S.E. of Setia.

XAGUA BAY, a large bay on the fourth coast of the island of Cuba. This is one of the best ports in the West Indies, and is 15 miles in circumference, surrounded with mountains, which break off the force of the winds. N. lat. $22^{\circ} 10'$. W. long. $81^{\circ} 20'$.

XAINTES, **SANTOS**, or *All-Saints' Islands*, as having been discovered on that holiday by the Spaniards; three small islands in the West Indies, situated to the fourth-east of Guadeloupe. The most westerly of them is called Terra de Bas, or the Low island, and the most easterly, Terra de Haut, or the High island. The third, which lies exactly in the middle between the other two, seems to be nothing more than a large barren rock, but is of use in assisting to form a very good harbour. The island of Terra de Bas is about nine miles in circumference, but the other is larger. These islands have constantly a fresh breeze, let the wind blow from what quarter it may: and on the Terra de Bas is a neat wooden church, with two very convenient creeks both for anchorage and landing. They are about six miles distant from Guadeloupe, and 15 from Mariegalante. N. lat. $15^{\circ} 56'$. W. long. $61^{\circ} 32'$.

XALAPA, a considerable town of Mexico, or New Spain, in the fertile province of Tlascala, formerly famous for the fair held on the arrival of the stated fleets from Europe; and since the declared freedom of commerce, a considerable mart for European commodities. It is situated on the southern skirts of a mountain, in a beautiful climate, the soil being partly clay and partly stony, while pure waters issue from a white sand, and fertilize the country. The population consists of 243 Spanish families, 182 Mexizos, and 361 Indians. When north winds prevail at Vera Cruz, it always rains at Xalapa; but the climate is esteemed very healthy. The purging powder of the country is made of the root of a plant, to which the town gives the name of Jalap; 30 miles E. of Puebla de los Angeles. N. lat. $19^{\circ} 50'$. W. long. $98^{\circ} 26'$.

XALISCO, a province of Mexico, in the audience of Guadalajara. It is washed by the South Pacific ocean on the fourth and west; bounded on the east by Guadalajara Proper and Mechoacan; and separated from Chiamaetan on the north, by a narrow strip of land belonging to Guadalajara, and running out into the sea. It is not above fifty leagues in extent either way. It abounds with Indian wheat and flax mines, but has very few cattle of any sort. From this province is brought the oil of the infernal fig-tree, as the Spaniards call it, much used in medicine.

XALISCO, a town of Mexico, which gives name to a province; 9 miles N.W. of Compostella Nueva. N. lat. $21^{\circ} 25'$. W. long. $106^{\circ} 26'$.

XALON, a river of Spain, which rises in a mountain near Medina Celi, and runs into the Ebro, about six miles above Saragossa.

XAMACA, a river of America, which runs into the gulf of Mexico, 18 miles from Vera Cruz.

XAMBRINA, a town of Spain, in the province of Leon; 2 miles S.E. of Tordeillas.

XAMDELILAH, an Arabian term, used as a grace or thanksgiving after meat.

The greatest men of that nation will often call in the

meanest, even the beggars, to eat with them; who, as soon as they have done, always rise and pronounce this word, which signifies, God be praised. Pococke's Egypt, p. 183.

XAMI, a name given by some of the old writers to the *ceratium* of the Greeks, or carob-tree. See **CHARNUB**.

XAN, in *Geography*, a river of the principality of Georgia, which runs into the Kur, 6 miles E. of Gory.

XANGA, a river of Africa, in the kingdom of Monngallo, which runs into the Indian sea, opposite to the island of the same name.—Also, one of the Querimba islands in the Indian sea, near the coast of Africa. S. lat. $10^{\circ} 45'$.

XANILA, a town of Fezzan, in the road to Egypt; 140 miles E.N.E. of Mourzouk.

XANQUE, or **GUYAPO**, a river of Mexico, which runs into the Spanish Maine, 30 miles W. of Cape Camaron.

XANTEN, or **SANTEN**, a town of France, in the department of the Roer, near the Rhine; 7 miles N.E. of Guelndres.

XANTHE, in *Botany*, so called from *ξανθος*, yellow, in allusion to its yellow juice.—Schreb. Gen. 710. Willd. Sp. Pl. v. 4. 877. Mart. Mill. Dict. v. 4. (Quapoya; Aubl. Guian. 897. Juss. 256. Lamarck Dict. v. 6. 21. Illustr. t. 831.)—Clafs and order, *Dioecia Monadelphia*. Nat. Ord. *Guttifera*, Juss.

Gen. Ch. Male. Cal. Perianth of one leaf, in five or six small, deep, imbricated, roundish, concave, acute segments, with a pair of minute opposite scales at the base. Cor. Petals five, roundish, spreading, larger than the calyx. Stam. Filament one, columnar, erect; anthers five, two-lobed, forming a peltate concave disk, full of gluten, their under side buriting, and discharging the pollen.

Female. Cal. like that of the male, permanent, inferior. Cor. as in the male. Stam. Filament none; anthers five, prismatic, erect, imperfect. Pist. Germen superior, roundish, with five furrows; style none; stigmas five, roundish, thick, emarginate, seated on the germen. Peric. Capsule small, globose or oval, with five furrows, five cells, and five valves, buriting at the furrows, their membranous partitions adhering to the central column. Seeds numerous, oblong, imbedded in the pulp, inserted in a double row upon the five-angled columnar receptacle.

Obs. It appears that one-fifth is frequently added to the parts of fructification, in the male as well as female flowers.

Eff. Ch. Male. Calyx in five deep segments. Petals five. Filament columnar. Anthers five, two-lobed, forming a peltate disk.

Female. Calyx and Corolla like the male. Stigmas five, sessile. Capsule of five cells, with many pulp seeds.

1. *X. scandens*. Twining Xanthe. Willd. n. 1. (Quapoya scandens; Aubl. Guian. 898. t. 343.)—Leaves obovate, fleshy. Capsule globose.—Native of the forests of Guiana, flowering in November. The stem is shrubby, with knotty branches, twining round neighbouring trees. Leaves opposite, on short stalks, simple, entire, thick, and smooth, three or four inches long, with a thick mid-rib, and a short blunt point, but no branching veins. Panicles at the ends of the drooping branches, compound, three-forked, smooth. Flowers small, yellow; their partial stalks longer than the calyx. Petals fleshy. Capsule about the size of a black currant, fleshy, crowned with the black stigmas all meeting in a point. Seeds red. Every part of the plant, when wounded, discharges a transparent, white, viscid, resinous juice. The Indians call this species *Quapoy*. See **QUAPOYA**.

2. *X. parviflora*. Small-flowered Xanthe. Willd. n. 2. (Quapoya Pana-panari; Aubl. Guian. 900. t. 344.)—Leaves elliptic-oblong. Flowers nearly sessile. Capsule elliptical.—Native of the same country. Differs from the preceding in having thinner leaves; smaller flowers, with shorter partial stalks; and an oblong, thicker, yellowish fruit. The bark and leaves, if cut or broken, discharge a yellow glutinous juice, which, when dried, resembles Gamboge, and is, like that substance, soluble in water. *Aubl.*

XANTHICA, Ξανθικα, in *Antiquity*, a Macedonian festival, so called because it was observed in the month Xanthus, at which time the whole royal family with the army was purified. See LUSTRATION.

XANTHIUM, in *Botany*, most unquestionably the ξανθιον of Dioscorides, book 4. chap. 138, as appears by his very apt description, owes its name to the use made of unripe fruit by the Greeks, to dye the hair yellow. Our common English species, *X. strumarium*, is evidently the identical plant of Dioscorides, and its specific name alludes to a reputed virtue of curing tumours.—Linn. Gen. 487. Schreb. 635. Willd. Sp. Pl. v. 4. 373. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 1017. Prodr. Fl. Græc. Sibth. v. 2. 234. Ait. Hort. Kew. v. 5. 268. Pursh 581. Juff. 191. Tourn. t. 252. Lamarck Illust. t. 765. Gært. t. 164.—Class and order, *Monoclea Pentandria*. Nat. Ord. *Compositæ nucamentacæ*, Linn. *Corymbifera anomala*, Juff.

Gen. Ch. Male flowers compound. Common Calyx of many imbricated, slender, equal scales, as long as the numerous florets. Cor. compound, uniform, equal, hemispherical, consisting of numerous, tubular, funnel-shaped, monopetalous, upright, five-cleft florets. Stam. Filaments in each flower five, united into a cylinder; anthers erect, parallel, distinct. Common Receptacle small, with chaffy scales between the florets.

Female flowers below the male, on the same plant, doubled. Cal. involucrem two-flowered, of two opposite, acutely three-lobed leaves, (their middle lobe longest,) beset with hooked prickles, and closely enfolding, as well as united to, the germens, except the lobes, which are free. Cor. none. Pisl. Germen oval, hispid; styles two pair, capillary; stigmas simple. Peric. Drupa dry, ovate-oblong, cloven at the point, clothed all over with hooked prickles. Seed. Nut of two cells.

Eff. Ch. Male, Common Calyx imbricated. Florets of one petal, funnel-shaped, five-cleft. Receptacle chaffy.

Female, Calyx two-leaved, two-flowered. Corolla none. Drupa dry, muricated, cloven. Nut of two cells.

Obs. Linnæus remarks, that the fruit of *Xanthium* could scarcely have been well understood, without a previous knowledge of that of *Ambrosia*. These genera in fact belong to that ambiguous tribe, whose habit, qualities, and in part the structure of their male flowers, all associate them with the compound or syngeneisus order; while the diffusion of their flowers, and the general nature of their female flowers, and fruit, necessarily refer them to the *Diclines*, or in the artificial system of Linnæus, the class *Monoclea*.

1. *X. Strumarium*. Common Burweed, or Small Burdock. Linn. Sp. Pl. 1400. Willd. n. 1. Ait. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 2544. Fl. Dan. t. 970. Bigelow Bot. 221. (Xanthium; Fuch's Hist. 579. Camer. Epit. 926. X. feu Lappa minor; Matth. Valgr. v. 2. 545. Bardana minor; Ger. Em. 809.)—Stem without thorns. Leaves heart-shaped; three-ribbed at the base.—Native of dung-hills, and rich moist ground, in various countries of Europe, as well as North America, flowering

towards autumn. In this island it is of very rare occurrence, though occasionally met with about London, and in the west. Dr. Sibthorp noticed the plant in many parts of Greece, where the soil is rich and rather wet, and found it called, by the modern Greeks, κολλυριόβρα; a name alluding to its bur-like property, rather than to the quality on which its ancient appellation is founded. The root is annual. Herb branched, rough, dark green, rather fetid, of a coarse rank habit, with furrowed, rather hairy, branches. Leaves alternate, stalked, heart-shaped, acutely lobed, and toothed or serrated; their two lateral ribs marginal, for a small space, at the base, as in the great Burdock, *Arctium Lappa*, and a few other plants. Male flowers globular, green, few together, in axillary or terminal clusters, about the upper part of the branches; female in axillary sessile tufts. Fruit elliptical, double-pointed, hard, near an inch long, beset with firm, prominent, awl-shaped, hooked prickles, which attach themselves to the coats of animals, and thus serve to disperse the seeds.

2. *X. orientale*. Oriental Burweed. Linn. Sp. Pl. 1400. Willd. n. 2. Ait. n. 2? Linn. Fil. Dec. 33. t. 17. "Schkuhr Handb. v. 3. 239. t. 291."—Stem without thorns. Leaves ovate, slightly three-lobed, somewhat triple-ribbed; wedge-shaped at the base.—Native of Ceylon, Japan, and China, from which last country it was imported, according to the younger Linnæus, with other seeds for the Upsal garden, in 1761. Sir Hans Sloane is recorded by Ray as having introduced this *Xanthium* into England in 1685; but their plant seems to have been a slight variety of the first, figured by Morison, sect. 15. t. 2. f. 2, found in America, and not answering to the distinctive characters of the present species, though Morison, and others who speak of this variety, are cited by Linnæus and Willdenow. The true *X. orientale* is an annual herb, of a more slender habit than the *Strumarium*, and more harsh, though less hairy. Their essential differences are indicated in our specific characters. The most remarkable seems to be the taper base of the leaves, in the present species, and the union of their three ribs, at a greater or less distance, above the insertion of the footstalk. The fruit is twice as large as the foregoing, with peculiarly strongly hooked thorns.

3. *X. echinatum*. Compound-thorned Burweed. "Murray in Comm. Goett. for 1784, with a figure." Willd. n. 3.—"Stem without thorns. Fruit oval; its prickles hooked, crowded, compound at the base." Annual.—Its native country unknown. Willdenow. We have not seen either a specimen or figure.

4. *X. spinosum*. Spinous Burweed. Linn. Sp. Pl. 1400. Willd. n. 4. Ait. n. 3. (*X. spinosum*, atriplicis folio; Morif. sect. 15. t. 2. f. 3. *X. lufitanicum spinosum*; Herm. Parad. 246, with a figure. Volkam. Norib. 404, with a figure. *X. lufitanicum*, laciniatum, validissimis aculeis munitum; Magnol. Hort. 208. t. 20.)—Stipulas thorny, three-cleft. Leaves lanceolate, three-lobed; hoary beneath.—Native of the south of France, as well as of Italy, Spain, and Portugal. It might be raised here as a tender annual, and planted out in a border, were there sufficient beauty in its copious, long, flame-coloured thorns, to entitle it to a place in the flower-garden. The leaves are not inelegant. Their upper surface is of a fine green, nearly smooth; the lower downy and white. The thorns are in fact stipulas, an inch long, very sharp, standing in pairs at the base of each footstalk, separating just above their origin into three spreading needle-like points. Flowers small and inconsiderable. Fruit oval, covered with

copious, small, hooked prickles. The wild plant makes a conspicuous appearance in winter, on banks about Montpellier.

For *X. fruticosum*, Linn. Suppl. 418, see FRANSERIA.

XANTHIUM, in *Agriculture*, a term under which the lesser burdock is sometimes known by writers, and which is found to be a very troublesome weed. See WEED.

XANTHOCHYMUS, in *Botany*, received that name, either from Dr. Roxburgh or Mr. Dryander, in allusion to the remarkable yellow juice of its fruit; the word being compounded of *ξανθος*, yellow, and *χυμος*, juice.—Roxb. Coromand. v. 2. 51. Ait. Hort. Kew. v. 4. 420.—Class and order, *Polyadelphia Polyandria*. Nat. Ord. *Guttifera*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of five roundish, unequal, obtuse, flattish, spreading, slightly imbricated, permanent leaves. *Cor.* Petals five, orbicular, nearly sessile, opposite to the calyx-leaves, and twice as long. Nectary of five broad, short, abrupt, porous glands, opposite to the petals, alternate with the stamens, inserted into the receptacle under the germen. *Stam.* Filaments twenty, united into five oblong, linear, flat bodies, alternate with the nectaries, and above twice as long; anthers stalked, roundish, of two lobes and two cells. *Pist.* Germen superior, globose; style scarcely any; stigmas five, spreading horizontally, obtuse, deciduous. *Peric.* Berry globose, succulent, with five ovate seeds, immersed in the pulp, some of which are generally abortive.

Eff. Ch. Calyx of five leaves. Petals five. Nectaries five, abrupt. Stamens united into five sets, alternate with the nectaries. Berry with from one to five seeds.

1. *X. pitarium*. Painter's Golden-apple. Roxb. Coromand. v. 2. 51. t. 196. Ait. n. 1.—Native of moist valleys, among the Circar mountains of Hindoostan, flowering in the hot season, and ripening fruit in November, December, and January. A large tree, whose tall trunk is covered with dark rough bark, and whose numerous, smooth, rather angular branches form an ample evergreen head. Leaves opposite, stalked, about a foot long and two or three inches broad, elliptic-oblong, acute, entire, coriaceous, smooth, and shining, with a strong mid-rib, and many transverse, parallel, fine, interbranching veins. *Footstalks* an inch in length, angular, channelled, corrugated. *Stipulas* none. *Flowers* an inch in diameter, five or six together, in stalked umbels, each umbel opposite to a leaf, or situated nearly where a last-year's leaf has been. *Partial stalks* simple, smooth, near two inches long. *Petals* white. *Stamens* and *Pistil* green. *Nectaries* and *Anthers* yellow. *Fruit* globular, drooping, somewhat pointed, orange-coloured, smooth, two inches or more in diameter. *Seeds* about the size and shape of almonds.

"The ripe apples," says Dr. Roxburgh, "are eaten by the natives. They are very inviting to the eye, and in taste little inferior to many of our apples in England. I have no doubt, if meliorated by culture, they would prove a delicious fruit." The green, but full-grown, fruit yields a large quantity of a gum, very like *Gummi Gutta*, Gambia. The best way to obtain it is by cutting the apples across, and to scrape off the juice, as it rapidly issues. When recent, it is of the consistence of very rich cream, bright yellow, considerably acrid, and somewhat nauseous to the taste. In a few days it hardens, and becomes less acrid. It makes a pretty good water-colour, either by itself, as a yellow, or mixed with other colours, to form green, &c. It has no particular smell when burnt. A milky juice exudes from the bark of this tree when wounded, which soon thickens, and in thickening assumes a yellow tint. It has no smell,

and, when first taken into the mouth, little taste; but after a while, a sense of dryness and acrimony extends a little way down the throat. This juice, like that obtained from the fruit, is perfectly soluble in spirits. *Roxburgh*.

The tree above described is no very remote relation of the Mangosteen, the most delicious fruit of India; so that Dr. Roxburgh's advice of improving it by culture may be well worthy the attention of horticulturists, if any be found in that part of the world where such experiments are practicable. The most obvious would be to obtain pollen of the Mangosteen, which, like that of many other plants, would probably bear carriage, and to impregnate with it some flowers of the *Xanthochymus*, whose progeny might thence perhaps be much altered.

XANTHON, a name given by some of the ancients to a species of marble of a yellowish-green colour, much used in ornamenting the inner parts of houses; and from its equal hardness with the Tænarium marble, and the equal high polish it was capable of, supposed by the workmen to be of the same species.

The word *xanthon* is of very dubious meaning, but is supposed as the name of this marble to have expressed a green colour, as this was otherwise called *marmor herbofum*. See TÆNARIUM and HERBOSUM *Marmor*.

XANTHORRHIZA, in *Botany*, received its name from the late M. L'Heritier; *ξανθος*, yellow, and *ρίζα*, a root, alluding to the colour of that part. We follow Marshall, Schreber, and Martyn, in correcting the original orthography.—Schreb. Gen. 727. Mart. Mill. Dict. v. 4. Lamarck Illustr. t. 854. (Zanthorhiza; L'Herit. Stirp. Nov. 79. Willd. Sp. Pl. v. 1. 1568. Ait. Hort. Kew. v. 2. 199. Pursh 212. Juss. 234. De Cand. Syst. v. 1. 386. Pointier in Lamarck Dict. v. 8. 838.)—Class and order, *Pentandria Polygynia*. (Polygamia Monœcia; Schreb.) Nat. Ord. *Mulsifligue*, Linn. *Ranunculæ*, Juss. De Candolle.

Gen. Ch. *Cal.* none; and, with the French botanists, we take the corolla for such. *Cor.* Petals five, ovate, acute, spreading, deciduous. Nectaries five, abrupt, two-lobed, spreading, inserted into the receptacle, alternate with the petals, and about half as long. *Stam.* Filaments five to ten, awl-shaped, very short; anthers roundish. *Pist.* Germens several, seven to eleven, superior, oblong; styles awl-shaped, incurved; stigmas acute. *Peric.* Capsules as many, inflated, ovate-oblong, bluntish and compressed at the top, where they burst, terminated obliquely by the styles, each of one cell and two valves. *Seeds* solitary, oblong, compressed, small, pendulous from the top of the capsule.

Obf. Many of the flowers want either the stamens or pistils.

Eff. Ch. Calyx none. Petals five. Nectaries five, abrupt, stalked. Capsules five, or more. Seeds solitary, pendulous.

1. *X. apifolia*. Parsley-leaved Yellow-root. (Zanthorhiza apifolia; L'Herit. Stirp. Nov. 79. t. 38. Willd. n. 1. Ait. n. 1. De Cand. n. 1. Pursh n. 1.)—Native of shady banks of rivers, from Virginia to Georgia, flowering in May. *Pursh*. Mr. Aiton says it was introduced, about the year 1766, by John Bush, esq. into the English gardens, where it is hardy, flowering in the early spring. Here it flowered unnoticed, or at least undescribed, till M. L'Heritier published his magnificent and learned work. The stem is shrubby, bushy, about a yard high, each branch crowned with a tuft of dark green, smooth, shining, long-stalked, pinnated leaves, whose leaflets, an inch or an inch and half long, are acute, rhomboid-lanceolate, sharply and unequally serrated in their fore-part. *Flowers* in long paniced clusters, from the

fame bud as the leaves, of a dark copper-coloured purple, like *Veratrum nigrum*, and though not gay or brilliant, not inelegant, when contrasted with the foliage. The root and stem are internally of a bright lemon-colour. The affinity of this plant to *Cimicifuga*, *Ajaca*, *Helleborus*, &c. would lead us to suspect, though there is no remarkable fetor, that its properties might be active, and accordingly it seems that the American physicians have employed it successfully in practice, as a tonic or stimulant. Probably its qualities may not be dissimilar from those of *Helleborus trifolius* of Linnæus; *Copis trifolia*, Salisb. Tr. of Linn. Soc. v. 8. 305. Pursh 390. Bigelow Am. Med. Bot. v. 1. 60. t. 5; the root of which the last-mentioned writer informs us is purely and intensely bitter, strengthening the stomach and other viscera, and promoting digestion. It makes a yellow tincture, like that of Gentian in flavour and medical virtues.

XANTHORRHEA, from *ξανθος*, yellow, and *ῥίζα*, to flow, a name given by the writer of this to the Yellow Gum plant of New Holland, which constitutes a most distinct and peculiar genus. Of this Mr. Brown has made us acquainted with seven species.—Sm. Tr. of Linn. Soc. v. 4. 219. Brown Prodr. Nov. Holl. v. 1. 287. Ait. Hort. Kew. v. 2. 271.—Clas and order, *Hexandria Monogynia*. Nat. Ord. *Apodetalis*, Juss. *Apodeteæ*, Brown.

Gen. Ch. Cal. none, unless the corolla be taken for such. Cor. inferior, of one petal, in six deep, nearly equal, oblong, permanent segments; the three inner ones concave, converging at the base. Stam. Filaments six, inserted into the lower part of the corolla, linear, flat, smooth, and naked, longer than the segments; anthers versatile. Pist. Germen superior, ovate, with the rudiments of many seeds in each cell; style cylindrical, with three furrows; stigma simple. Peric. Capule projecting beyond the closed permanent corolla, ovate, with three blunt angles, woody, almost horny, polished, acute, of three cells, and three valves, the partitions from the middle of each valve. Seeds one or two in each cell, bordered, compressed, with a hard black shell; the scar at the base, naked; embryo transverse; albumen soft and fleshy.

Eff. Ch. Corolla inferior, in six deep segments, permanent. Filaments flat, linear, naked. Capule triangular, polished. Seeds one or two, compressed, bordered.

Mr. Brown, from whose examination, of the living plants, we have improved our generic description above, remarks, that the species of this genus have a peculiar habit, so striking, that were they abundant, they give a singular character to the face of the country. The body of the root is sometimes elevated into a thick, scarred, black stem, often divided or branched, and several feet in height, exuding a fragrant yellow resin: in other instances it is very short, scarcely rising above the surface of the ground. Leaves very numerous, crowded, narrow, grassy, of great length, linear, somewhat triangular, or two-edged, spreading every way; recurved at the extremity; dilated, and half-sheathing at the base; rigid and elastic when dry. Flower-stalk terminal, quite simple, round, often many feet in length, smooth, firm, hard, and durable. Spike terminal, solitary, cylindrical, dense, many-flowered, resembling a catkin, sometimes equal in length to the stalk itself. Flowers sessile, closely crowded, small, white, each accompanied by numerous, imbricated bractæas, tapering at the base into a claw, the innermost gradually smallest. Capules of a shining chestnut, partly black.

“The structure of the seeds agrees with *Borya*, Labill. Nov. Holl. t. 107. Brown Prodr. v. 1. 286; nor are these two genera very dissimilar in foliage or inflorescence. They

are placed at the end of the *Apodeteæ*, because of their fleshy albumens, and the black crustaceous skin of their seeds.” Brown.

1. *X. arborea*. Arboreous Yellow-gum. Br. n. 1.—“Stem arborescent. Leaves two-edged; triangular beyond the middle; striated in front. Stalk scarcely the length of the very long spike. Bractæas and corolla beardless.”—Native of the country near Port Jackson, New South Wales. Each division of the thick stem is crowned with a large tuft of innumerable long, slender, drooping leaves, in the centre of which the flower-stalks stand solitary. See n. 3.

2. *X. australis*. Southern Yellow-gum. Br. n. 2.—“Stem arborescent. Leaves compressed longitudinally. Stalk shorter than the elongated spike. Bractæas subtending the tufts of flowers elongated.”—Native of the island of Van Diemen, where it was gathered by Mr. Brown. We have seen no specimen.

3. *X. Hoffile*. Spear Yellow-gum. Br. n. 3. Ait. n. 1. (Yellow resin-tree; White’s Voyage, 235. t. at p. 249.)—Stem very short. Leaves compressed longitudinally. Stalk many times longer than the eighteen-inch spike. Bractæas, and outer segments of the corolla, downy at the point.—Native of New South Wales, from whence we received specimens in 1790, by favour of Dr. John White. It is said to have been sent, in 1803, to Kew garden, by Philip Gidley King, esq. A green-house plant, flowering in April and May. In the description given by Dr. White, at the place above quoted, he evidently confounds this species and the *X. arborea*; for he says “it is about the size of an English Walnut-tree. The trunk grows pretty straight for about fourteen or sixteen feet, after which it branches out into long spiral leaves, which hang down on all sides, and resemble those of the larger kinds of grass, or sedge. From the centre of the head of leaves arises a single footstalk, eighteen or twenty feet in height, perfectly straight and erect, terminating in a spike of a spiral form. This large stalk is used by the natives for making spears and fish-gigs, being pointed with the teeth of fish, or other animals.” The first part of this description appears to belong to the *arborea*; the latter, regarding the inflorescence, to the *Hoffile*; which might easily, perhaps, except by a scrutinizing botanist, be supposed different stages of growth, or varieties, of the same plant. Such a mistake may be more easily accounted for than that of the great Linnæus, in combining nearly the whole genus of *Aloe* into one species. The Yellow Resin is produced by the present, and some other, species of this genus, by spontaneous exudation from the trunk; or promoted sometimes, as we judge from the appearance of certain specimens, by fires kindled by the savage natives of the country. The juice, fluid at first, soon hardens in the sun, into a concrete brittle form, of a dull orange colour. Burnt on hot coals, it emits a fragrant smoke, smelling like a mixture of balsam of Tolu and Benzoin, approaching in some degree to Storax. This resin is perfectly soluble in spirit of wine, but not in water, nor even in essential oil of turpentine, unless digested in a strong heat. The varnish which it makes with either is weak, and of little use. Dr. White found this Yellow Gum a good pectoral medicine, in many cases. If burnt in a room, the scent, though pleasant to some people, soon proves oppressive, and the smoke irritating to the lungs. Olive gum, used by the Italians, is preferable for fumigation.

4. *X. media*. Intermediate Yellow-gum. Br. n. 4.—“Stem rather short. Leaves (longitudinally?) compressed. Stalk very long, many times exceeding the eighteen-inch spike. Bractæas and corolla beardless.”—Observed by Mr. Brown

Mr. Brown near Port Jackson. He is not quite confident of its being a distinct species from the last.

5. *X. minor*. Lesser Yellow-gum. Br. n. 5.—“Stem none. Leaves triangular; flat in front; rather concave beyond the middle. Stalk many times longer than the spike. Bractæes scarcely longer than the tufts of flowers, all, like the corolla, beardless.”—Gathered by Mr. Brown, in New South Wales. The *spike* of this species measures from five to eight inches. *Brown*.

6. *X. bracteata*. Long-bracteated Yellow-gum. Br. n. 6.—“Stem none. Leaves triangular; below the middle somewhat elevated in front; beyond it rather concave. Stalk many times longer than the spike. Bractæes subtending the tufts twice or thrice the length of the flowers, lanceolate and divaricate, all, like the corolla, beardless.”—From the same country. The *spike* is only from three to six inches in length. *Brown*.

7. *X. Pumilio*. Dwarf Yellow-gum. Br. n. 7.—“Stem none. Leaves below the middle flattish, with a slightly elevated ridge on both sides; beyond it triangular and channelled. Stalk many times longer than the ovate spike. Bractæes nearly equal, beardless as well as the corolla.”—Gathered by Mr. Brown, in the tropical part of New Holland. The *flower-stalk* itself is, in this species, only a foot high. *Brown*.

XANTHOXYLUM, received its name from governor Cadwallader Colden, because of the yellow hue of the wood, to which *ξανθός*, yellow, and *ξύλον*, wood, alludes. We make no scruple to follow the example of professor Martyn, in restoring the proper orthography; nor is it requisite to burthen our readers with a perpetual indication of the original blunder, under every species, though that blunder has the sanction of Linnæus, and perhaps of all the authors, except Martyn, that we may have to quote. They generally write the word *Zanthoxylum*, or *Zanthoxylon*.—Linn. Gen. 519. Schreb. 684. Willd. Sp. Pl. v. 4. 753. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 382. Pursh 209. Swartz Ind. Occ. 570. Juss. 374. Lamarck Dict. v. 2. 38. Illustr. t. 811. Gært. t. 68. (Fagara; Duham. Arb. v. 1. 229. t. 97. Swartz Prodr. 33.)—Class and order, *Dioecia Pentandria*. Nat. Ord. “*Hederaceæ*,” Linn. rather his *Dumoseæ*. *Terebinthaceæ affinis*, Juss.

Gen. Ch. corrected. Male, *Cal.* Perianth very small, in three or five deep, concave, rather acute segments. *Cor.* Petals three or five, oval, erect, concave, thrice the length of the calyx. *Stam.* Filaments three or five, awl-shaped, erect; longer than the petals; anthers roundish, two-lobed, furrowed.

Female, *Cal.* like the male, inferior, permanent. *Cor.* like the male, deciduous. *Pist.* Germens from two to five, roundish, each terminating in an awl-shaped style, longer than the petals; stigmas obtuse. *Peric.* Capsules from one to five, stalked, each of one cell, and two coriaceous valves, bursting at the inner margin. *Seeds* solitary, roundish, polished, pendulous from an upright bristle-shaped stalk.

Eff. Ch. Male, Calyx in three or five small deep segments. Petals three or five.

Female, Calyx like the male, inferior, permanent. Petals three or five. Capsules from one to five, of two valves, and one cell. Seeds solitary, pendulous.

Obf. This genus is distinguished from FAGARA, (see that article,) by having separated *flowers*, either three-cleft, or five-cleft, and pendulous *seeds*. Botanists appear to have mistaken its real character, taking the *corolla* for a *calyx*. To this error Linnæus and Duhamel led the way,

and Jussieu, Willdenow, and others, have followed them. Yet Linnæus in his *Gen. Pl.* subjoins to his generic description a more correct statement, altogether superseding the former; and Willdenow admits species from Swartz, whose *petals* by their presence contradict his essential character. We have not seen living specimens of *Xanthoxylum*, but the descriptions of Browne and Swartz leave little doubt of the correctness of the above characters. We are much tempted to unite the two genera in question, but as they really have not been sufficiently investigated, and Gærtner seems to have discovered a distinctive mark of *Xanthoxylum*, in the stalked pendulous *seeds*, we leave them for future inquiry. The whole genus is shrubby or arborescent, with alternate, pinnate, sometimes only ternate, entire, or somewhat crenate *leaves*, and clustered, or panicled, *flowers*. The *stem* is, in most instances, armed with prickles, that are sometimes very formidable. The *wood* is hard, and serviceable for many purposes.

SECT. 1. *Stem without prickles.*

1. *X. ternatum*. Three-leaved Yellow-wood. Swartz Ind. Occ. 570. Willd. n. 1. (Fagara trifoliata; Swartz Prodr. 33.)—Prickles none. Leaves ternate, obovate, slightly emarginate, shining; dotted beneath.—Received by Sir Joseph Banks from the island of Dominica. A *shrub*, six feet high, with roundish, subdivided *branches*, angular when young. *Leaves* on smooth, spreading, channelled *shoots*. *Leaflets* on small partial stalks, entire, rigid, veiny; contracted at the base; paler beneath, and minutely dotted with black. *Clusters* axillary, compound. *Flowers* small, whitish. *Germens* three, contiguous, like one three-lobed germen. *Stigmas* three, sessile. *Capsules* three, each of two hemispherical valves, with two internal, membranous, whitish valves. *Seeds* solitary, roundish, polished. *Swartz*.

2. *X. emarginatum*. Emarginate Yellow-wood. Swartz Ind. Occ. 572. Willd. n. 2. Ait. n. 1. (Fagara emarginata; Swartz Prodr. 33. Lauro affinis, terebinthifolium alato, ligno odorato candido, fere albo; Sloane Jam. v. 2. 24. t. 168. f. 4.)—Prickles none. Leaves pinnate, ovate, emarginate, veiny. Flowers triandrous.—Native of mountains in the interior parts of Jamaica, where it is vulgarly called *Lignum vorum*, a corruption of *Lignum Rhodium*, the smell of every part of the shrub resembling the latter when rubbed, or held near the fire. The *stem* is woody, branched, round. *Leaflets* about three pair, rarely with an odd one, above an inch long, veiny, rather coriaceous, and shining. *Clusters* terminal, somewhat compound, erect. *Flowers* minute, whitish. *Calyx* in five deep, ovate, acute, permanent segments. *Petals* only three, ovate, concave, spreading, twice the size of the calyx. *Stamens* three, very short. *Germens* three-lobed, with three sessile *stigmas*. *Capsule* seldom more than one perfected, with two internal, as well as external, valves, and one orbicular, black, shining *seed*. *Swartz*.

3. *X. acuminatum*. Pointed-leaved Yellow-wood. Swartz Ind. Occ. 575. Willd. n. 3. (Fagara acuminata; Swartz Prodr. 33.)—Prickles none. Leaves pinnate, elliptical, pointed, coriaceous. Flowers triandrous.—Native of mountainous parts of Jamaica. A *shrub*, with round spreading *branches*. *Leaflets* three or four pair, laurel-like, shining. *Gymes* terminal, subdivided in a forked manner. *Flowers* crowded, small, white. *Calyx* of three minute ovate leaves. *Petals* three, obtuse, concave, one line and a half long. *Stamens* three, shorter than the *corolla*. *Fruit* globose, the size of a pepper-corn, only one *capsule*, out of three, coming to perfection.

SECT. 2. *Stem prickly.*

4. *X. punctatum*. Dotted Yellow-wood. Willd. n. 4. “Weft

XANTHOXYLUM.

"West St. Croix 236."—Stem prickly. Leaves ternate, or pinnate, oblong, finely crenate; dotted beneath.—Native of the island of Santa Cruz. *Willdenow.*

5. *X. spinifolium.* Prickly Triandrous Yellow-wood. Swartz Ind. Occ. 574. Willd. n. 5. (*Fagara spinosa*; Swartz Prodr. 23.)—Stem prickly. Leaves pinnate, with many pair of sessile, ovate, pointed leaflets; prickly beneath, as well as the branches. Flowers triandrous.—Native of dry mountainous situations in Jamaica. A *shrub*, about six feet high, with a round, branching, upright stem. *Spines* (rather we presume *prickles*) scattered, prominent, needle-like, as long as the finger-nail; those of the main stem stronger, and thicker at the base. *Leaves* a foot long, with a compressed *footstalk*, round and prickly at its base, and, if we understand right, furnished with a pair of prickles before each pair of *leaflets*, which are nearly sessile, eight or ten pair in all, ovate, with a short emarginate point, veiny, rigid, smooth, and shining, very minutely crenate at the edges, their mid-rib occasionally prickly. *Cymes* terminal, with minute, white, crowded *flowers*. *Calyx* with three ovate acute segments. *Petals* three, ovate, larger than the calyx. *Filaments* scarcely any. *Anthers* ovate, converging. *Germen* in three distinct lobes. *Stigmas* three, sessile, obtuse. *Fruit* not observed. *Swartz.*

We have been more full in our descriptions of Dr. Swartz's four species, that the reader may compare their characters with *Fagara*. Nothing is said of their *flowers* being separated, or dioecious.

6. *X. Clava Herculis.* Great Prickly Yellow-wood. Linn. Sp. Pl. 1455, excluding the synonymy of Duhamel. Amœn. Acad. v. 3. 16. Willd. n. 6. Ait. n. 2. Swartz Obl. 375. (*X. spinifolium*, *lenticifolium longioribus foliis*, *euonymi fructu capsulari*; Cat. Car. v. 1. t. 26, according to Linnæus. *X. aculeatum*, *fraxini sinuosis et punctatis foliis*; Pluk. Phyt. t. 239. f. 4.)—Stem with broad angular prickles. *Leaflets* ovate, pointed, crenate; nearly equal at the base; common *footstalk* prickly. *Flowers* terminal, panicle.—Native of woods in the West Indies and Carolina, flowering in March and April. It is marked by Mr. Aiton as a green-house plant, cultivated ever since Miller's time, flowering in April and May. The *trunk* is woody, often, according to Swartz, 30 or 40 feet high, armed with very powerful *prickles*, which are thick at their base, angular and sharp at the point. *Leaves* a foot long, pinnate, as in all the following species; their common *footstalks* armed with scattered straight prickles, one-third of an inch long; *leaflets* about seven pair, on short partial stalks, unequally divided by their smooth mid-rib, and somewhat falcate, an inch and a half or two inches long, bordered with shallow unequal notches, smooth and rather shining. *Clusters* terminal, compound. *Flowers* polygamous, there being some united ones, though not perfecting seed, on one tree, and others entirely female, on another. The former have a minute five-toothed *calyx*. *Petals* five, thrice as long, ovate, erect, or a little incurved. *Filaments* five, twice the length of the petals, and inserted between them. *Anthers* oblong, cloven at the base. *Germen* roundish, abortive, with five awl-shaped erect *styles*, and simple *stigmas*. The female *flowers* have a five-toothed *calyx*; five concave *petals*; no *filaments*. *Germen* five, united into a roundish body. *Styles* none. *Sigma* peltate, slightly convex, a little elevated, with five furrows. *Capsules* five, combined, or one of five lobes, each lobe having two valves, and containing a roundish, black, shining *seed*. Our description of the fructification is taken from Dr. Swartz. The *leaves* bear but a

slight resemblance to the Mastick-tree, or any other species of *Pistacia*, being decidedly crenate.

7. *X. aromaticum.* Aromatic Yellow-wood. Willd. n. 7. (*Euonymo affinis arematica*, five *Xanthoxylon spinifolium*, *fraxinellæ foliis cheufanicum*; Pluk. Amalth. 78. t. 393. f. 2.)—Stem with opposite prickles. *Leaflets* ovato-lanceolate, serrated; unequal at the base; common *footstalk* prickly. *Panicles* terminal.—Native of Chufan. "A *shrub* with straight prickles. *Leaflets* two, three, or four pair, pointed, one inch and a half long, marked with pellucid dots; rounded near the base, at the upper edge; contracted at the lower. *Common footstalk* beset with strong, nearly opposite, prickles." *Willdenow*, from a dried specimen, without *flowers*. Plukenet says, "the fruit is a single, round, rough, or warty *capsule*, tasting strongly of camphor, lined with a white, smooth, insipid membrane, containing a black polished *seed*, with a hollow whitish fear, in which lies the thread connecting the seed with its capsule." This very accurate description determines the genus. He adds, that the Chinese use this fruit instead of pepper.

8. *X. rhoifolium.* Stomach-leaved Yellow-wood. Lamarck n. 2. Willd. n. 8. (*Euonymo affinis aromatica*, five *Xanthoxylon spinosissimum*, *fraxini angustiore folio punctatum*; Pluk. Amalth. 76. t. 392. f. 1.)—Stem prickly. *Leaflets* lanceolate, finely serrated; nearly equal at the base; common *footstalk* downy and prickly. *Panicles* axillary.—Brought from the islands of Chufan, like the preceding. *The leaves* are a foot long. *Leaflets* nine to eleven pair, with an odd one, each three inches in length, pointed, dotted; slightly downy beneath. *Footstalk* sometimes without prickles. *Willdenow*. Plukenet's figure represents the *panicle* much like the preceding, but lateral. The *capsules* seem to be one, two, or three from each *flower*.

9. *X. juglandifolium.* Walnut-leaved Yellow-wood. Willd. n. 9. (*X. americanum*, five *Herculis arbor aculeata major*, *juglandis foliis alternis parùm sinuosis*; Pluk. Phyt. t. 239. f. 6?)—Stem prickly. *Leaflets* oblong, pointed, obscurely serrated; unequal at the base; common *footstalk* somewhat prickly. *Panicles* terminal.—Native of Hispaniola and Nevis. *Leaves* pinnate, with an odd one; *leaflets* alternate, coriaceous, two or three inches long, marked with distant, scarcely visible, pellucid dots; their edges entire to the naked eye, but under a magnifier appearing furnished with close distant serratures; contracted near the base, at the upper edge; rounded at the lower, rather downy beneath. *Common footstalk* beset with a few short scattered prickles. *Panicles* terminal, much branched, dense, downy. *Capsules* four or five, rather downy, pointed. *Seeds* black.

10. *X. rigidum.* Rigid Yellow-wood. Willd. n. 10.—"Stem prickly. *Leaflets* elliptical, entire, emarginate, pointed; their veins hairy beneath; mid-ribs and *footstalks* prickly."—Native of South America. *Humboldt and Bonpland*. *Leaflets* four pair, coriaceous, on very short stalks; the upper ones largest, two inches long; lower but half an inch; their base rather unequal; sometimes having a short, obtuse, crenate point; their upper side polished, reticulated with veins; under paler, with one long, reddish, awl-shaped prickle on the mid-rib of each, of which there are several on the common stalk. *Flowers* not seen. *Willdenow*.

11. *X. hermaphroditum.* Cayenne Yellow-wood. Willd. n. 11. (*Fagara pentandra*; Aubl. Guian. v. 1. 78. t. 30.)—Stem prickly. *Leaflets* elliptic-oblong, pointed, entire; nearly equal at the base; common *footstalk* without prickles. *Panicles* terminal, repeatedly compound. *Flowers* united.

united.—Gathered by Aublet, in the forests of Cayenne, flowering in May, and bearing fruit in August. A tree, whose trunk is 40 or 50 feet high, and two feet and a half in diameter, with a prickly bark. The wood is white, hard, and compact. *Leaflets* about five pair, nearly sessile, smooth; the largest six inches long, and an inch and a half broad. *Panicles* large and much branched, composed of numerous, small, white flowers, having *filaments* and *stamens* in the same individual. *Capsules* three, four, or five from each flower, reddish, each containing a black, shining, oily seed. These *capsules* have a pungent aromatic flavour, and the Creoles call them negro's pepper.

12. *X. fraxineum*. Ash-leaved Yellow-wood, or Common Tooth-ache Tree. Willd. n. 12. Arb. 413. Ait. n. 2. Pursh n. 1. (*X. Clava Herculis* B; Linn. Sp. Pl. 1455. *X. ramiflorum*; Michaux Boreal.-Amer. v. 2. 235. *Fagara fraxini folio*; Duham. Arb. v. 1. 229. t. 97.)—Stem prickly. *Leaflets* ovate, very minutely serrated; equal at the base. *Umbels* axillary.—Native of shady woods, near rivers, from Canada to Virginia and Kentucky, flowering in April and May. A tincture of the bark and capsules is recommended in rheumatism and the tooth-ache, whence its English name. *Pursh*. A large deciduous shrub, whose *branches* are armed with sharp, conical, compressed, brown prickles, very broad at the base. *Leaflets* four or five pair, with an odd one, an inch and a half long, on short partial stalks; contracted at each end; more or less distinctly crenate, or bluntly serrated; smooth above; soft and downy beneath. Their common *footstalk* is described without prickles; but in our specimens it is always furnished with some, and occasionally with very numerous ones. The flowers are small, yellowish-green, in little dense umbels, just above the scars of last year's footstalks, accompanied by a tuft of downy young leaves. The mode of inflorescence abundantly distinguishes this species from all the rest. It is hardy in our gardens, flowering in March and April, before the leaves appear. The bark is used in America, as a powerful sudorific and diuretic, whence its use, as above-mentioned, in rheumatic disorders. This is the species most popularly taken for *X. Clava Herculis*, as appears by the herbarium of Jacquin, purchased formerly by Sir Joseph Banks, and even by that of Linnæus. The two species, nevertheless, are widely different.

13. *X. tricarpum*. Three-grained Yellow-wood. Michaux Boreal.-Amer. v. 2. 235. Pursh n. 2. Ait. n. 4.—Stem prickly. *Leaflets* stalked, oblong-oval, pointed, very smooth, finely serrated; oblique at the base: common footstalk prickly. *Capsules* three, sessile.—In the woods of Carolina and Florida, flowering in July. *Michaux*, *Pursh*. Introduced into the English gardens in 1806, by Mr. John Lyon. A hardy shrub. *Aiton*.

14. *X. heterophyllum*. Various-leaved Yellow-wood. (*Macqueria Commerfoni*; Juss. 374, under *Xanthoxylum*.)—Young branches prickly; their leaves with very numerous serrated leaflets, on prickly common stalks; old ones unarmed, their leaves of seven entire leaflets, on unarmed common stalks. *Panicles* axillary. *Capsules* solitary.—Gathered in the isle of Bourbon, by Commerfon, some of whose specimens are in our possession. Nothing can be more paradoxical than the appearance of this shrub. We must rely on its discoverer for the accuracy of his specimens, as the two branches, so very different in appearance, are not connected together; though we cannot doubt their generic identity. The young branch is slender, covered with innumerable, sharp, ascending prickles, of various sizes, a line long at most. *Leaves* alternate: common footstalk of

each five or six inches long, round, straight, channelled, beset with numerous prickles, like those of the branch, but smaller: leaflets from 40 to 60, or more, opposite or alternate, ovate, bluntish, smooth, crenate or bluntly serrated, one quarter or one-third of an inch in length, of a fine green, paler beneath, marked with pellucid dots; their mid-ribs bearing one or two prickles at the back. The older or flowering branches are stout, rugged, unarmed, leafy at their extremities only. *Leaves* alternate, rather crowded, altogether destitute of prickles, each consisting of three pair of obovate, bluntly pointed, entire, coriaceous, veiny, smooth leaflets, with an odd one; the lowermost smallest: common footstalk channelled, smooth. *Panicles* compound, rather shorter than the leaves; their stalks unarmed, compressed, and angular. *Capsules* only one, perfected in each flower, brown, the size of a pepper-corn, rugged, full of pellucid dots lodging a pungent aromatic camphorated oil, and very bitter. *Seed* black, polished, with a bivalve elastic tunic, or lining of the capsule.

For *X. trifoliatum*, Linn., see PANAX *Aculeatum*.

XANTHURUS INDICUS, in *Ichthyology*, the name of a fish called by the Dutch *geel-fardet*.

It is of the size and shape of the bream; its jaws are armed with straight and very sharp teeth, which stand almost straight out; its back is yellow, and its tail very strongly tinged with that colour; its belly is of a blueish-white; its head brown, and its fins of a fine red. It is caught with hooks among the rocks on the shores of the East Indies, and is a very wholesome and well-tasted fish. *Ray*.

XANTHUS, in the *Natural History of the Ancients*, the name of an iron-ore of the hematites or blood-stone kind, and usually accounted a species of it, and called by others *Elatites*.

It was of a pale yellowish-white, or the colour of the French pale yellow ochre, used by our painters; but like all other ferruginous bodies it became red by burning.

Theophrastus gives us expressly the etymology of the name, observing that it was called so from its colour; the Dorians calling a yellowish-white *ξανθος*, *xanthus*.

XANTHUS, in *Ancient Geography*, a famous river of Asia Minor, in the Troade. According to Pliny, it had its source in mount Ida, and discharged itself at the port of the Achæans into the Hellespont, after having joined the Simois.—Also, a river of Asia Minor, in Lycia, which had its source in mount Taurus, and watered the towns of Xanthus and Patara, and ran into the Mediterranean, near the last of these places. This river was anciently called Sirbes, according to Strabo, and he says that the temple of Latona was situated ten stadia above its mouth, and fifty stadia farther was the town of Xanthus.

XANTHUS, or *Xanthopolis*, a town of Asia Minor, and the largest in Lycia. It was situated seventy stadia from the mouth of the river on its bank. Pliny reckons fifteen miles from this town to the mouth of the river. Under Appian, the inhabitants of Xanthus were such enthusiasts for liberty, that when it was taken by Brutus they burnt it, and preferred death to submission to the conqueror. He adds, that the same circumstance occurred with regard to Harpalus, general of Cyrus the Great, and Alexander the Great. It subsisted in the time of Strabo.—Also, a town of the isle of Lesbos.

XANTIPPE, in *Biography*. See SOCRATES.

XANTON, in *Geography*, a town of France, in the department of the Vendée; 5 miles E. of Fontenay-le-Comte.

XANXUS, in *Natural History*, a name given by some authors to a large species of sea-shell, somewhat like that with which the Tritons of old were painted. It is found in great abundance near Ceylon, and is used there in medicine as an alkali and abortif in the same cases in which we give the testaceous powders.

XAPARACO, in *Geography*, a town of Mexico, in the province of Mechoacan; 85 miles W.N.W. of Mechoacan.

XARAMA, a river of Spain, which runs into the Tagus, a little below Aranjuez.

XARAYES, or ZARAYOS, *Laguna de Los*, a supposed lake of Brasil, formed by the river Paraguay; about 108 miles in length, and 21 in breadth. This is merely an inundation of the river, and exploded as a lake. S. lat. $17^{\circ} 45'$.

XATHOS, in *Ichthyology*, a name given by Appian to the fish called by the generality of authors the *erythrinus*, or *rubellio*.

XATIVA, now St. FELIPE, in *Geography*. See St. Felipe.

XAVIER, a town of Spain, in Navarre, the native place of the celebrated missionary of that name; 3 miles E. of Sanguesa.

XAVIER. See SABI.

XAVIER Gogo, a town of Africa, in the country of Whidah; 12 miles N.E. of Sabi.

XAVIER, *Saint*. See SAINT Xavier.

XAVIER Zante, a town of Africa, in the country of Whidah; 14 miles N.W. of Sabi.

XAUXA, a town of Peru, in the bishopric of Guamanga, containing two churches; 90 miles E. of Lima. S. lat. 12° . W. long. $75^{\circ} 30'$. See JAUIJA.

XAUXA, a river of South America, which rises in the Andes, about 75 miles N. from Atun Xauxa, and uniting with the Apurimac, forms the Ucayale.

XAUXAVA, a town of Morocco, on a river, and at the foot of a mountain, both of the same name; 15 miles N. of Morocco.

XEBEC, in *Sea Language*, a small three-masted vessel, navigated in the Mediterranean sea, and on the coasts of Spain, Portugal, and Barbary. The fore and main masts are called block-masts, being short, and formed square at the head, to receive sheaves, to reeve the jeers, &c. The mizen-mast is fitted with a top-mast, &c. similar to a small English ship, and which has been lately added, to keep them better to the wind. The xebecs have no bowsprit, but a sort of boomkin, wouled and confined to the prow, nearly horizontal (see GALLEY), to the outer end of which lead the bow-lines. The fore-mast rakes much forward, has no stay, and the shrouds set up, similar to the runners in English cutters or sloops, to toggles fixed in the sides. These shrouds are easily shifted when the vessels go about. The main-mast is nearly upright, and rigs as the fore-mast. Each mast carries a latteen-sail, the largest side of which is bent to a yard that hoists by a pulley round the mast, at about one-third its length; the yards are worked at the lower end by bow-lines, and the sail extended by a sheet at the clue. The upper lee-yard-arm is worked by a brace, and the strain supported by vangs nearer the mast. The mizen-mast carries a latteen-sail, similar to the main and fore mast. Vessels with latteen-sails will lie one point nearer the wind than a square-rigged vessel. Xebecs, particularly in France, have been rigged similar to polacres; but they never fail so well as they did in their primitive situation.

The xebec, generally equipped as a corsair, is constructed with a narrow floor, to be more swift in pursuit of

the enemy; and of a great breadth, to enable her to carry a great force of sail for this purpose, without danger of overturning. As these vessels are usually very low built, their decks are formed with a great convexity from the middle of their breadth toward the sides, in order to carry off the water, which falls aboard, more readily by their scuppers. But as this extreme convexity would render it difficult to walk thereon at sea, particularly when the vessel rocks by the agitation of the waves, there is a platform of grating along the deck from the sides of the vessel toward the middle, on which the crew may walk dry-footed, whilst the water is conveyed through the grating to the scuppers.

When a xebec is equipped for war, she is occasionally navigated in three different methods, according to the force or direction of the wind. Thus, when the wind is fair, and nearly astern, it is usual to extend square sails upon the main-mast, and frequently upon the fore-mast; and as those sails are rarely used in a scant wind, they are of an extraordinary breadth. When the wind is unfavourable to the course, and yet continues moderate, the square yard and sails are removed from the masts, and laid by, in order to make way for the large latteen yards and sails, which soon after assume their place; but if the foul wind increases to a storm, these latter are also lowered down and displaced, and small latteen yards, with proportional sails, are extended on all the masts. The xebecs, which are generally armed as vessels of war by the Algerines, mount from sixteen to twenty-four cannon, and carry from three hundred to four hundred and fifty men, two-thirds of whom are generally foldiers. Falconer.

XEBEROS, in *Geography*, a town of South America, in the audience of Quito; 40 miles S.W. of La Laguna.

XEJUI, a river of Paraguay, which runs into the Paraguay.

XEKIAS, in *Biography*, a name given by the Chinese and Japanese to an Eastern philosopher of mythological origin and character, called also Buddas among the Indians, Somonacodom in Siam, and after his death Foc or Fotoki, who fascinated the whole northern and eastern region of Asia, as well as part of the southern, with his pantheistic doctrine. It is probable, as some have said, that he lived about 600 years before Christ; and having first appeared in the southern part of India, on the borders of the Indian ocean, disseminated his philosophy by means of his disciples to all India. It is said that he spent twelve years in solitude, when he was instructed by the Tolopoin, called by the ancients "hylobii," *i. e.* sylvan hermits; and that in his 30th year he devoted himself to contemplation, and attained to the intuitive knowledge of the first principles of all things, from which he took the name of Foc, which signifies, "something more than human." His mythical philosophy was delivered to his innumerable disciples under the veil of allegory. The Japanese add, that in his contemplations, during which his body remained unmoved, and his senses unaffected by any external object, he received divine revelations, which he communicated to his disciples.

Buddas, or Xekias, in his esoteric doctrine, taught the difference between good and evil; the immortality of the souls of men and brutes; different degrees of rewards and punishments in a future world; and the final advancement of the wicked, after various migrations, to the habitations of the blessed. Amidas, who, according to the Chinese, is Xekias himself, presides in these habitations, and is the mediator, through whose intercession bad men obtain a mitigation of their punishment. These dogmas are contained in an ancient book, called Kio, which all the Indians beyond the Ganges, who follow the doctrine of Xekias,

receive as sacred, and which is illustrated by innumerable commentaries.

The doctrine which Xekias delivered towards the close of his life to his esoteric disciples was very different. Vacuum, or void, was, according to his instruction, the principle and end of all things, simple, infinite, eternal, but destitute of power, intelligence, or any other similar attribute; and that to be like this principle, by extinguishing all passion and affection, and remaining absorbed in the most profound contemplation, without any exercise of the reasoning faculty, is the perfection of happiness. The first principle in this system cannot be pure nihilism, which admits of no properties; probably, it is First Matter, without variable qualities, whence all things are supposed to arise, which is not to be perceived by the senses, but contemplated as the latent divinity, infinitely distant from the nature of visible things, yet the origin of all substances. The emanations from this fountain became, in the popular theology, objects of the grossest superstition and idolatry.

The doctrine of Foe, or Xekias, was embraced by innumerable disciples. Among these, one of his most eminent successors was Tamo, a Chinese, who was so entirely devoted to contemplative enthusiasm, that he spent nine whole years in profound meditation, and was on this account deified.

According to the Bramins, Xekias had neither father nor mother; and as no Indian city claims the honour of his birth, he was probably a foreigner, who migrated to the southern part of India from some neighbouring maritime country, perhaps from Lybia; whither he came with some Egyptian colony, and who had been instructed in the Egyptian mysteries. It is not improbable, that at the time when Cambyles conquered Egypt, and dispersed almost the whole nation, this impostor might have passed over into India, and propagating his doctrine among an ignorant and superstitious people, became an object of universal veneration. Brucker's *Philos.* by Enfield, vol. ii. Appendix. See BOODH, BRACHMANS, CHINA, JAPAN, &c.

XEL, in the *Materia Medica of the Ancients*, a name given to the fruit *fel*.

XELSA, in *Geography*, a town of Spain, anciently a Roman colony, called Julia Celsa.

XELVA. See CHELVA.

XENDAY, a town of Japan, in the island of Nippon; 115 miles N.N.E. of Jedo. N. lat. 39°. E. long. 141° 52'.

XENEXTON, a word used by Paracelsus, to express a sort of amulet to be worn about the neck, to preserve people from infection in the plague.

XENIA, *Ξενια*, q. d. *gifts*, in some *Ancient Customs*, were gifts, or presents, made to the governors of provinces, by the inhabitants thereof.

The word occurs pretty frequently in charters of privileges; where *quietos esse à xenis* denotes an exemption from making such presents to kings and queens, upon their travelling through such precincts.

XENIA, in *Geography*, a township of Ohio, in the county of Greene, with 1429 inhabitants.

XENIL, a river of Spain, which rises in Grenada, and runs into the Guadalquivir, about three miles below Ecija.

XENINEPHIDEI, a word used to express a sort of imaginary spirits, mentioned by the adepts, as delighting to discover the occult qualities of bodies to men.

XENISMI, *Ξενισμοι*, in *Antiquity*, sacrifices offered at the Athenian festival Anaxia.

XENOCRATES, in *Biography*, a famous Grecian phi-

loopher, was born at Chalcedon, in the first year of the 96th Olympiad (B.C. 396), and attached himself at first to Æschines, but afterwards became a follower of Plato, and succeeded Speusippus in the chair of the old academy (B.C. 339). His temper was gloomy, his aspect severe, and his manners were little tinged with urbanity. Plato took pains to correct these obliquities of his disposition and character; and as he highly respected his master, he probably improved by his instruction, so that he was reckoned as one of his most esteemed disciples. Xenocrates was held in such estimation among the Athenians for his virtues, and especially his integrity, as well as his wisdom, that in a public trial his simple avowal was accepted instead of an oath, which was usually required; and that even Philip of Macedon found it impossible to corrupt him. Dreading his influence, and the temptation of a bribe, he declined all private intercourse with the Macedonian sovereign, and was honoured by him with this testimony; that of all persons who had come to him on embassies from foreign states, Xenocrates was the only one whose friendship he was not able to purchase. On occasion of being employed as an ambassador to the court of Antipater, for the redemption of several Athenian captives, he waved the honour of accepting the invitation of this prince to sit down with him at supper, in the words of Ulysses to Circe, cited from Homer's *Odyss.* (l. x. v. 383); thus translated,—

“What man, whose bosom burns with gen'rous worth,
His friends enthral'd, and banish'd from his fight,
Would taste a selfish, solitary joy?”

The patriotic spirit expressed in this appropriate passage gratified Antipater so much, that he immediately released the prisoners. As another example of his moderation, it is alleged, that when Alexander, wishing to mortify Aristotle, on account of some accidental pique, sent Xenocrates a magnificent present of 50 talents; he accepted only 30 minæ, returning the residue to the donor with this message; that the whole sum was more than he should have been able to spend during his whole life. In this instance, he also manifested a superiority to that kind of jealousy and revenge which might have actuated meaner minds, when it is considered that Aristotle had instituted a school in the Lyceum, in opposition to the academy over which Xenocrates presided. In the use of food he was singularly abstemious; his chastity was invincible by the seducing arts of Phryne, a celebrated Athenian courtesan; and his humanity was testified by the shelter which he afforded to a sparrow that was pursued by a hawk, and fled into his bosom, where he allowed it to remain till its enemy was out of sight, alleging that he would never betray a suppliant. In the employment of his time, he allotted a certain portion of each day to its proper business, one of which he devoted to silent meditation. His high sense of the importance and utility of mathematical studies was sufficiently evinced by his refusing to admit into his academy a young man who was ignorant of geometry and astronomy, because he was destitute of the handles of philosophy. Upon the whole, Xenocrates was eminent, both for his purity of morals, and his acquaintance with science; and he supported the reputation of the Platonic school by his lectures, his writings, and his conduct. His life was prolonged to the third year of the 116th Olympiad (B.C. 314), or the 82d year of his age, when he accidentally fell in the dark into a reservoir of water.

His philosophic tenets were Platonic; but in his lectures he adopted the language of the Pythagoreans. In his system, unity and diversity were principles in nature, or gods; the former being the father, and the latter the mother of the universe.

universe. The heavens he represented as divine, and the stars as celestial gods; and besides these divinities, he taught that there are terrestrial demons, of a middle order between the gods and men, partaking of the nature both of mind and body, and, like human beings, capable of passions, and liable to diversity of character. He probably conceived with Plato, that the superior divinities were ideas, or intelligible forms, proceeding immediately from the Supreme Deity, and the inferior gods, or demons, to be derived from the soul of the world, and, like that principle, compounded of a simple and a divisible substance, or of that which always remains the same, and that which is liable to change. Diogen. Laert. Plut. de Virt. Mor. De If. et Osir. De Anim. Gent. Cicero de Nat. Deor. Brucker's Hist. Phil. by Enfield, vol. i.

XENODOCHUS, formed of ξένος, *stranger*, and δέχομαι, *I receive*, an ecclesiastical officer of the Greek church, the same with the hospitaler, or a person who takes care of the reception and entertainment of strangers.

St. Isidore, a priest and solitary, surnamed *Xenodochus*, lived in the fourth century. He was thus called, because entrusted with that office in the church of Alexandria.

XENOPARACHUS, formed of ξένος, *stranger*, and παρέχω, *I furnish*, among the Romans, an officer who provided ambassadors with all kinds of necessaries, at the public expense.

XENOPHANES, in *Biography*, the founder of the Eleatic sect, was born at Colophon, about the 56th Olympiad (B.C. 556); and having left his country, took refuge in Sicily, where he gained a subsistence by reciting, in the court of Hiero, elegiac and iambic verses, which he had written against the theogonies of Hesiod and Homer. From Sicily he removed to Magna Græcia, where he became a celebrated preceptor in the Pythagorean school, without adhering strictly to the doctrines of Epimenides, Thales, and Pythagoras. His life was prolonged to the advanced age of 100 years, that is, till the 81st Olympiad (B.C. 456), during 70 years of which he occupied the Pythagorean chair of philosophy. In Enfield's *Philosophy of Brucker* we have the following summary of the doctrine of Xenophanes:—In metaphysics, he taught, that if ever there had been a time when nothing existed, nothing could ever have existed. That whatever is, always has been from eternity, without deriving its existence from any prior principle; that nature is one and without limit; that what is one is similar in all its parts, else it would be many; that the one infinite, eternal, and homogeneous universe, is immutable and incapable of change; that God is one incorporeal eternal being, and, like the universe, spherical in form; that he is of the same nature with the universe, comprehending all things within himself; is intelligent, and pervades all things; but bears no resemblance to human nature either in body or mind.

In physics, he taught, that there are innumerable worlds; that there is in nature no real production, decay, or change; that there are four elements, and that the earth is the basis of all things; that the stars arise from vapours, which are extinguished by day, and ignited by night; that the sun consists of fiery particles collected by humid exhalations, and daily renewed; that the course of the sun is rectilinear, and only appears curvilinear from its great distance; that there are as many suns as there are different climates of the earth; that the moon is an inhabited world; that the earth, as appears from marine shells, which are found at the tops of mountains, and in caverns far from the sea, was once a general mass of waters; and that it will at length return into the same state, and pass through an endless series of similar revolutions.

The doctrine of Xenophanes concerning nature is so obscurely expressed by those who have transmitted an imperfect account of it, that it has been misunderstood and misrepresented. Some have confounded it with the atheistical system of Spinoza; by others it has been accommodated to the ancient doctrine of emanation; and others have maintained its similarity to the Pythagorean and Stoical notions of the soul of the world. The truth seems to have been, according to Brucker's statement, that he held the universe to be one in nature and substance; distinguishing in his conception between the matter of which all things consist, and that latent divine force, which he considered not as a distinct substance, but an attribute, and yet necessarily inherent in the universe, and the cause of all its perfection. This view of his notion is consistent with the language he used, and with the account of his doctrine, preserved by Sextus Empiricus, that God is of the same nature with the universe; τὸ θεῖον συμπύκνως πᾶσι. When he asserted that there is no motion in nature, it is probable that he understood the term motion metaphysically, meaning merely that there is no such thing in nature as passing from nonentity to entity, or the reverse. Accordingly, the ancients more generally applied the term motion to a change of nature than to change of place. Brucker is of opinion that the notion ascribed to Xenophanes concerning the nature and origin of the celestial bodies, as meteors daily renewed, must have been founded on a misconception and misrepresentation of his opinion on the subject. See **ELEATIC Philosophy**.

XENOPHILES, an able Greek musician, who professed the philosophy of Pythagoras, and who lived at Athens, where he arrived at the great age of 105. It is Lucian who gives this account of his extraordinary longevity from Arilotoxenon.

XENOPHON, the son of Gryllus, an Athenian, was distinguished as a philosopher, commander, and historian. His engaging appearance whilst he was a youth induced Socrates to admit him into the number of his disciples. Under his tuition he made rapid progress in that kind of wisdom for which his matter was so eminent, and which qualified him for all the offices of public and private life. Having accompanied Socrates in the Peloponnesian war, and manifested his valour in defence of his country, he afterwards entered into the army of Cyrus as a volunteer; but his enterprise against his brother proving unfortunate, Xenophon, after the death of Cyrus, advised his fellow-soldiers to attempt a retreat into their own country rather than to surrender themselves to the victor. His advice was regarded, and he was chosen as their commander. In the exercise of this duty he acquired by his prudence and firmness a high degree of honour; and the memorable adventure is related by himself in his "Retreat of the Ten Thousand." Having joined Agesilaus, king of Sparta, after his return into Greece, and fought with him against the Thebans in the celebrated battle of Cheronea, he displeased the Athenians by this alliance; and he was publicly accused for his former engagement in the service of Cyrus, and condemned to exile. Thus ignominiously treated, the Spartans took him under their protection, and provided for him a comfortable retreat at Scillus, in Elis. In this asylum he enjoyed the pleasures of domestic life with his wife and two children for several years, and availed himself of the leisure that was thus afforded him by writing those historical works which have rendered his name immortal. On occasion of a war between the Spartans and Eleans, he was obliged to abandon this agreeable retreat, and to join his son, who was settled at Lepreus. From hence he afterwards removed with his whole family to Corinth, where, in the second year of the

105th Olympiad (B.C. 359), his life terminated, at the age of about 90. As a philosopher, he was an ornament to the Socratic school by his integrity, piety, and moderation; and in his whole military conduct, he was distinguished by an admirable union of wisdom and valour. As a writer, he has presented to succeeding ages a model of purity, simplicity, and harmony of language, expelling sentiments truly Socratic. By his wife Phiteia he had two sons, Gryllus and Diodorus; the former of whom ended his life with military glory in the battle of Mantinea. The news of his son's death was communicated to him whilst he was offering sacrifice; and upon receiving it, he took the crown from his head, uttering with a sigh these memorable words, "I knew that my son was mortal;" but when he heard that he had fought bravely, and died with honour, he again put on the crown, and finished the sacrifice. As an historian, he may be considered in his "Hellenics" as the continuator of Thucydidēs, and as having brought down the affairs of Greece to the battle of Mantinea. His "Cyropædia," or "Institution of Cyrus," is generally regarded as a work of fiction rather than of real history, exhibiting, under the name of the elder Cyrus, the picture of a perfect prince, according to his own conception of the character. His "Anabasis" (or *Ascens*) is an account of that memorable expedition of the younger Cyrus, in which he himself appears so conspicuous. This work appeared under the name of Themistogenes of Syracuse, to whom Xenophon himself ascribes it; nevertheless it has been universally ascribed to Xenophon: but if this be the case, it must have been written from memory, long after the events, which are differently related by Diodorus. Among his political works we may enumerate his accounts of "The Republic and Laws of Sparta;" "Of the Republic of Athens and its Revenues;" his "Praise of Agesilaus;" and his "Hiero, or Dialogue on Tyranny." Of a miscellaneous class, he wrote a treatise on "Oeconomics;" "On Hunting;" and "On the Office of Master of the Horse." The character of Xenophon, portrayed in his writings, seems to have exemplified virtue and humanity, kind and generous feelings, and a considerable degree of piety blended with superstition. In his *Anabasis* he exhibits a singular degree of credulity and regard to celestial warnings, which, in his view of them, governed his conduct, and were miraculously verified by the event. For his preference of the Spartan to the Athenian government and manners, derogating from his patriotism, the only apology is his banishment. His style has been always admired for its purity, simplicity, and clearness; and his works are reckoned amongst the most popular of the Greek classics, and have passed, collectively and separately, through several editions. Laertius. *Ælian. Hist. Var. Fabr. Bib. Græc. vol. ii. Brucker's Philof. by Enfield, vol. i.*

XENOXUA, in *Geography*, a town of European Turkey, in Macedonia; 36 miles S.E. of Akrida.

XEQUETEPEQUE, a town of Peru, in the government of Truxillo, on the Pacsa Mayo; 55 miles N. of Truxillo.

XERANTHEMUM, in *Botany*, from ξηρός, dry, and ἄνθος, a flower, a name well adapted to express the dry and durable nature of the flowers of the present genus, one of the tribe popularly denominated Everlasting Flowers.—Linn. Gen. 420. Schreb. 551, excluding *Xeranthemoides* of Dillenius. Willd. Sp. Pl. v. 3. 1901. Mart. Mill. Dict. v. 4. the first section only. Sm. Prodr. Fl. Græc. Sibth. v. 2. 172. Ait. Hort. Kew. v. 5. 20. Tourn. t. 284. Juss. 179, excluding *Elichrisum* of Tournefort. Lamarck Illustr. t. 692. f. 1. Gærtu. t. 165.—Clafs and

order, *Syngenesia Polygama-superflua*. Nat. Ord. *Compositæ nucamentaceæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. Common Calyx imbricated; scales numerous, elliptic-lanceolate, scarious, permanent, the inner ones much longer than the disk, coloured, forming a radiant crown to the whole compound flower. Cor. compound, somewhat unequal; florets of the disk very numerous, all perfect, tubular, funnel-shaped, much shorter than the calyx, in five equal spreading segments; those of the circumference fewer, female, tubular, somewhat two-lipped, with five unequal segments. Stam. (in the perfect florets) Filaments five, capillary, very short; anthers forming a cylinder rather longer than the corolla. Pist. (in the same florets) Germen short; style thread-shaped, longer than the stamens; stigma cloven: in the female florets, Stam. none. Pist. Germen and style as in the perfect florets; stigma simple, club-shaped. Peric. none, except the calyx scarcely at all altered, except being clofed. Seed in both kinds of florets alike, oblong; down a row of taper-pointed narrow scales. Recept. flattish, clothed with linear acute scales, rather longer than the florets.

Eff. Ch. Receptacle scaly. Down of taper-pointed scales. Calyx imbricated, its inner scales forming a coloured spreading radius.

Obf. Gærtner has long ago observed, what indeed no one could overlook, that the essential character of this genus, as given by Linnaeus, answers to his first species only, *X. annuum*. This stands in the *Syst. Veg.* making a section by itself, characterized by a chaffy receptacle; whereas the other sections, "with a naked receptacle," receive all the numerous species besides, and directly contradict the generic character, "*receptaculum paleaceum*." Gærtner, Jussieu, and Willdenow, have properly corrected this oversight, as we have shewn under *ELICHRYSUM*. The true *Xeranthemum*, therefore, would be left with a solitary species, sufficiently well marked indeed to be so distinguished, as far as the Linnæan species go. But our great master is proved to have confounded several together, under his *X. annuum*. Willdenow distinguishes three species, two of which we cannot separate, but we shall subjoin a fourth. They were all known to Tournefort, who indeed divides them still further, mistaking double or white flowered varieties as species. The roots of the whole genus is annual. Herb erect, rigid, alternately branched, clothed with fine, white, close, cottony down, easily rubbed off. Leaves alternate, sessile, lanceolate, acute, undivided, entire; tapering at the base. Flowers solitary, on long, terminal, slightly scaly, stalks. Outer scales of the calyx roundish, membranous and shining, at least at the edges; inner oblong, spreading while in flower, purple or brownish, occasionally white, very brilliant and ornamental.

1. *X. annuum*. Purple *Xeranthemum*, or Everlasting Flower. Linn. Sp. Pl. 1201. Willd. n. 1. Ait. n. 1. Prodr. Fl. Græc. n. 2045. Jacq. Austr. t. 388. Mill. Illustr. t. 67. Mill. Ic. t. 279. (*X. flore simplici, purpureo, majore*; Tourn. Inst. 499, with perhaps the five following of that author. *X. incanum non scetens, flore majore*; Morif. sect. 6. t. 12. f. 2. *Parmica austriaca*; Cluf. Hist. v. 2. 11. Ger. Em. 607. *αἰθρημακον* of Dioscorides, according to Dr. Sibthorp.)

2. Linn. Sp. Pl. 1201. (*X. inapertum*; Willd. n. 2. Ait. n. 2; excluding the synonym of Morison. *X. capituli inapertis*; Hall. Enum. 709. t. 23. *X. n. 122*; Hall. Hist. v. 1. 52. *Parmica Imperati*; Ger. Em. 606, no figure. *Jacea oleæ folio, minore flore*; Bauh. Pin. 272.)

Outer calyx-scales roundish-elliptical, awned, smooth at

the keel; inner lanceolate, spreading. Crown of the seed lanceolate, shorter than the calyx.—Native of dry hilly ground in Austria, Hungary, France, Italy, and Greece; β is found in Switzerland, Spain, and Germany. This species is a hardy annual, common in our gardens, ever since the time of Gerard and Lobel, flowering in July and August. The first variety, and especially the femidouble kind, figured by Philip Miller in his *Icones*, is preferred for cultivation. The flowers with their stalks, dried quickly, preserve their shining purple colour very long, and make part of the winter decorations of a chimney-piece; but for this purpose, the back of every coloured scale of the calyx should be drawn, while fresh, over the edge of a blunt knife, to keep the flower open after it is dried. The stem is erect, branching, bearing linear-lanceolate, white, cottony leaves, and numerous flowers, an inch or more in diameter. The outer calyx-scales are membranous and shining, pale, quite smooth, each with a red or brownish mid-rib, most conspicuous upwards, and terminating in a small awn-like point.

In the variety β the flowers are of a smaller diameter, and the calyx spreads less; but we do not find that its outer scales are more acute, though somewhat variable in that respect; the inner are less strikingly purple, and turn browner as they fade. This variety we have from the Valais, as the undoubted plant of Haller, sent by the late Mr. Davall. Both kinds have a pleasant aromatic scent, different from the strong odour of the following.

2. *X. cylindraceum*. Cylindrical Xeranthemum. Sm. Prodr. Fl. Græc. n. 2046. (*X. orientale*, flore minimo, calyce cylindraceo; Tourn. Cor. 38. *X. oleæ folio capitulis simplicibus, incanum, fætens, flore purpurascente minore*; Morif. v. 3. 43. fect. 6. t. 12. f. 1.)—Outer calyx-scales elliptical, pointless, woolly at the keel; inner lanceolate, erect.—Native of Germany and Asia Minor. Gathered by Dr. Sibthorp on the Bithynian Olympus, or in its neighbourhood. Seeds of this species were given to Mr. Davall by professor Lachenal at Basle, for the common *X. annuum*, as figured by Haller; but on seeing the real plant of that author, above described, from the country of the Valais, he allowed them to be distinct. Mr. Davall first detected the true specific difference, in the woolly scales of the calyx, which, moreover, want the red mid-rib of the preceding species. Morifon indeed describes this mid-rib, which proves that he confounded *X. annuum* β , as many other people have done, with our *cylindraceum*; for Mr. Davall observed the strong disagreeable smell in his specimens, by which Morifon characterizes the plant before us.

3. *X. orientale*. Oriental Xeranthemum. Willd. n. 3. Ait. n. 3. (*X. annuum* γ ; Linn. Sp. Pl. 1201. *X. orientale*, fructu maximo; Tourn. Cor. 38. *X. oleæ folio, capitulis compactis*; Morif. v. 3. 44. fect. 6. t. 12. f. 4. *Jacea oleæ folio, capitulis compactis*; Bauh. Pin. 272. *J. incana, folio oleæ*; Dalech. Hist. 1193. Lob. Ic. 545. f. 1.)—Outer calyx-scales roundish, membranous; inner ovate, pointed, erect. Crown of the seed ovate, awned, longer than the calyx.—Native of Armenia and Syria. The leaves of this species appear to be broader and more elliptical than either of the foregoing. But its most striking difference is visible in the ovate scales, forming the crown of the seeds, each of them ending in a long point, far overtopping the upright radiant scales of the calyx. We have never seen a specimen, but the figures above cited render the plant sufficiently intelligible. Willdenow describes the flowers the size of *X. annuum*, or larger. Surely Lamarck's t. 692. f. 2. cannot be intended for this plant! We know nothing aufwerable to that figure.

XERANTHEMUM, in *Gardening*, contains plants of the herbaceous, flowering, annual kinds, in which the species cultivated are, the annual xeranthemum, or common eternal flower (*X. annuum*); the reflexed-leaved eternal flower (*X. retortum*); the golden eternal flower (*X. speciosissimum*); the silvery eternal flower (*X. lefamoides*); the prolificus eternal flower (*X. proliferum*); the leafy-flowered eternal flower (*X. velutum*); and the imbricated eternal flower (*X. imbricatum*). As to the species of Xeranthemum, see the preceding article.

The first is an herbaceous flowering plant, of which there are varieties with large white flowers, with double white flowers, with double purple flowers, and with double violet-coloured flowers.

Method of Culture.—In the first sort and varieties, the culture is readily effected by sowing the seeds in pots of light fresh mould, in the autumn or spring, or at other seasons for a succession; plunging them in a moderate hot-bed, to bring forward the plants. In the spring they may also be sown in patches where they are to remain, or in beds to be afterwards removed. When the plants have a few inches growth, they should be pricked out in rows a foot apart on beds, or into the borders, clumps, or other places where they are to grow. They should afterwards be kept clean from weeds, and have occasional waterings immediately after pricking out, and afterwards in dry weather.

The other sorts are raised by planting cuttings of the young shoots in the summer, in pots filled with light mould, giving them a little water and shade; or, which is better, plunging them into a hot-bed, and covering them with hand-glasses. When they are become firmly established in the autumn, they should be carefully removed into separate pots, being replaced in the hot-bed till re-rooted, after which they should have the management of other shrubby green-house plants.

The first sort produces a fine effect in the borders, clumps, &c. while growing, as well as in pots when the flowers are taken off; and the other sorts afford variety in green-house collections, among other potted plants of the same kind.

XERASIA, in *Medicine*, the name of a disease, a species of alopecia, in which the hair falls off through a dryness of the part, and want of due nourishment.

XERASIA, in *Animals*, denotes a certain kind of diseased state, which consists in a dryness of the hairs, caused by the want of due and sufficient nourishment and support, from which they decay and fall off. It is met with in such animals as have been starved, and kept and fed in a stinted manner only on poor sorts of food. It is to be removed by a better and more full kind of fodder, and other sorts of keep, and by being turned into a good salt-marsh pasture. See *SURET*.

XERUARQUO, in *Geography*, a town of Mexico, in the province of Mechoacan; 45 miles N.E. of Mechoacan.

XERES, a town of South America, in Paraguay, now in ruins. S. lat. 20° 5'.

XERES de Badajoz, or *Xeres de los Caballeros*, a town of Spain, in Estremadura; 72 miles N.N.W. of Seville. N. lat. 38° 17'. W. long. 6° 52'.

XERES de la Frontera, a town of Spain, in the province of Seville, on the Guadalete; near which a battle was fought between the Moors and Goths, in the year 712, in which Roderick, the last king of the Goths, lost his life. The environs are celebrated for that excellent wine corruptly called sherry. The best and richest sort of sherry is called "pagarette," from the Spanish word *pago*, a district, and particularly applied to this vintage. In one aranzado (an acre of vineyard) they plant 1800 vines at regular distances.

tances. It is reckoned a good year if it gives three butts per acre, middling if two, and bad if but one: some years, however, it yields four or five. The number of inhabitants is estimated at 40,000, of whom one-twentieth, Mr. Swinburne says, are religious; 15 miles N.E. of Cadiz. N. lat. 36° 41'. W. long. 6° 15'.

XERES de la Frontera, a town of Mexico, in the province of Zacatecas, with a garison of Spaniards to protect the mines; 25 miles S. of Zacatecas.

XERES de Guadiana, a town of Spain, in the province of Seville, near the frontiers of Portugal; 74 miles W. of Seville.

XERES Nueva, a town of South America, in the province of Venezuela.

XERES. See **CHULUTECA**.

XERICA, a town of Spain, in the province of Valencia; 7 miles N.W. of Segorbe.

XERIFF, in *Commerce*, a money of account in Morocco, which is divided into eight pael.

XERITO, in *Geography*, a small river of Spain, which runs into the Alagon.

XEROCHLOA, in *Botany*, from ξηρος, *dry*, and χλωα, *a grass*.—Brown Prodr. Nov. Holl. v. 1. 196.—Clafs and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Eff. Ch. Calyx two-flowered, of two unequal valves, parallel to the hollow of the receptacle, and half sunk therein; the outer valve smallest. Corolla of both flowers longer than the calyx, of two valves, awl-shaped, membranous, awnless. Stamens in the outermost flower. Styles in the inner one, combined at the base. Nectary none. Seed enclosed in the inner, paper-like, valve of the corolla.

This genus consists of perennial, rushy, dry, smooth grasses. *Leaves* awl-shaped, straight and stiff, with a very short *stipula*. *Stem* terminated by alternate sheaths, each containing from two to four short *spikelets*, of few *flowers*. *Xerochloa* is akin to *Apluda*, whose character requires correction. *Brown*.

1. *X. imberbis*. Beardless *Xerochloa*. Br. n. 1.—*Spikelets* awl-shaped, slightly curved. Inner valve of the male flowers smooth.—Gathered by Mr. Brown, in the tropical part of New Holland.

2. *X. barbata*. Bearded *Xerochloa*. Br. n. 2.—*Spikelets* lanceolate, straight. Inner valve of the male flowers bearded.—Native of the same country. *Brown*.

XERODES, in *Animals*, a term which is applied, and which serves to express any sort of tumour that is attended with the property of exsiccation or dryness. See **TUMOUR**.

XEROMYRON, formed of ξηρος, *dry*, and μυρον, *ointments*, a word used by the ancients to express what they do at other times call in express words a dry ointment. It was a composition of warm aromatic drugs, or of other things fit for external use, but without the fatty ingredients, by which they were usually reduced into the form of ointments.

XEROPHAGY, Ξεροφαγια, formed of ξηρος, *dry*, and φάγω, *I eat*, among the *Ancients*, the feeding only on dry victuals, which was the practice of the athletes.

In the first ages of the church, some, not contented with simple fasting, added the xerophagy thereto; abstaining not only from flesh and wine, but also from all fresh, succulent, and vinous fruits. And some even brought themselves to bare bread and water.

Tertullian, in his book *De Abstinencia*, cap. 9. speaks of the xerophagia as a thing commendable in time of persecution.

XEROPHTHALMIA, Ξεροφθαλμια, compounded of ξηρος, *dry*, and οφθαλμος, *eye*, a kind of ophthalmia, in

which the eyes itch, and are red, but without swelling or watering.

XEROPHYLLUM, in *Botany*, from ξηρος, *dry*, and φυλλον, *a leaf*, a genus founded by Michaux upon *Helonias asphodeloides* of Linnæus.—Michaux Boreal-Amer. v. 1. 210. Willd. Enum. 402.—We confess ourselves unable to make out any sufficient reason for this measure, either in the author's description, or in the plant itself. Mr. Pursh probably was equally puzzled; for he has not even cited the *Xerophyllum* of Michaux, as a synonym under the above *Helonias*. It seems the bases of the *flamens* are dilated in the *asphodeloides*, more than in other species of **HELONIAS**. See that article.

XEROPHYTA, so named by Jussieu, from ξηρος, *dry*, and φυτον, *a plant*, alluding to the arid habit of this little shrub.—Juss. Gen. 50. Willd. Sp. Pl. v. 2. 15. Lamarck Illustr. t. 225.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Bromelia*, Juss.

Gen. Ch. *Cal.* none. *Cor.* of one petal, superior; limb in six deep ovate-oblong, acute, permanent segments; the three outer ones narrowest, spinous-pointed, stoutest, externally glandular. *Stam.* Filaments six, inserted into the lower part of each segment, thread-shaped, very short, equal; anthers erect, linear, half as long as the corolla. *Pist.* Germen inferior, turbinate; style one, short; stigma tumid, oblong, undivided. *Peric.* Capsule oval, rough, crowned with the faded corolla, with three cells, and many seeds.

Eff. Ch. Corolla in six deep segments, permanent; three outermost narrowest, spinous-pointed. Stamens inserted into the base of each segment. Stigma club-shaped. Capsule inferior, of three cells, with many seeds.

1. *X. pinifolia*. Fir-leaved *Xerophyta*. Willd. n. 1.—Gathered by Commerfon, in Madagafcar. A hard rigid shrub, whose stem is round, alternately branched; the wood formed of parallel tubes, as in the generality of the monocotyledonous tribe: branches quarter of an inch in diameter, thickly clothed with the imbricated, deeply furrowed, permanent sheaths of the last year's foliage, each crowned with the reflexed base of a leaf, by which the whole branch assumes a singular scaly appearance. *Leaves* alternate, two inches, or more, in length, linear, rigid, channelled, striated, with thick entire edges, and a pungent spinous point; their base sheathing, fibrous, and somewhat woolly. *Flowers* terminal, one or two at the end of each branch, on simple stalks, an inch long, rough, like the germen, with minute prominent glands, of which some traces are also found on the backs of the three outward segments of the corolla. The colour, of the inner segments at least, appears reddish. Each flower is about half the size of a snowdrop. Nothing is known of the ripe fruit, in which perhaps some better marks, than have hitherto been given, may be found, to distinguish the essential characters of this genus from those of **HYPOXIS**. See that article.

XEROPKIN, in *Commerce*, a silver coin of Goa, in the East Indies, which is worth 3s. 1½d. sterling, nearly.

XEROTES, in *Botany, ξηροτης, *dryness*, a name chosen by Mr. Brown to express the arid rushy habit of this genus, in preference to *Lomandra*, by which it is designated in the work of M. Labillardiere. This latter appellation, formed of λωμα, *a border*, or rather *fringe*, and αυρ, *a male*, is designed to indicate the occasionally bordered anthers. It might perhaps have been allowed to remain, as well as many other names which are liable to some exception, though the anthers are not properly fringed.—Brown Prodr. Nov. Holl. v. 1. 259. (*Lomandra*; Labill. Nov. Holl. v. 1. 92.)—Clafs and order, *Dioecia Hexandria*. Nat.*

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Nat. Ord. *Tripetaloidæ*, Linn. *Junci*, Juff. *Juncæ*, Brown.

Gen. Ch. Male, *Cal.* Perianth of six regular, ovate, coloured leaves; the three innermost, or perhaps all the six, connected at the base. *Cor.* none, unless the calyx be so called. *Stam.* Filaments six, very short, inserted into the base of each leaf of the calyx; anthers orbicular, peltate. Some rudiments of a *pistil*.

Female, *Cal.* Perianth of six separate, permanent leaves. *Cor.* none. *Stam.* imperfect. *Pist.* Germen superior, ovate, with three furrows; styles three, short, combined at the base; stigmas obtuse. *Peric.* Capsule cartilaginous, coated, of three cells and three valves, with partitions from the centre of each valve. *Seeds* solitary, peltate.

Eff. Ch. Male, Calyx of six leaves; three innermost combined at the base. Corolla none. Anthers peltate.

Female, Calyx of six separate, permanent leaves. Styles three. Capsule superior, coated, of three cells; valves with central partitions. *Seeds* peltate, solitary.

This New Holland genus consists of perennial herbs, of a dry rigid texture, and a peculiar aspect, resembling the *Junci* and *Calamariae*. *Root* fibrous. *Stem* none, or generally very short; sometimes divided, and clothed with sheathing foliage. *Leaves* grassy, linear, either flat or channelled, rarely thread-shaped; their base dilated, membranous, half sheathing; their extremity sometimes toothed. *Flowers* terminating the stem, or radical stalk, either panicled, racemose, spiked, or capitate. Inner leaves of the calyx often different from the outer in texture or size. When the flowers are sessile, they are invested with imbricated membranous bractæas; the male ones are sometimes stalked, without bractæas. Bark of the capsule at length separating, and occasionally a little pulpy. In some species, the skin of the seed adheres so loosely, as to resemble a distinct tunic. The embryo is longitudinal, straight, in the bottom of a cartilaginous albumen. *Xerotes* is allied in many points to the PALME. See that article. *Brocn.*

SECT. 1. *Female flowers in solitary heads. Leaves entire at the extremity.*

1. *X. flexifolia*. Spiral-leaved Xerotes. Br. n. 1. (*Dracæna obliqua*; Thunb. *Dracæn.* 6. t. 1. f. 2.)—Stem somewhat branched. Leaves shorter than the branches, two-ranked, twisted; their edges rough with minute teeth; their points withering, acute. Male spikes interrupted, somewhat branched longer than the leaves.—Native of New South Wales, from whence specimens were sent us by Dr. White. The stem is about a foot high; woody at the base; more or less branched above, clothed with numerous, narrow, smooth, striated leaves, an inch or an inch and a half long, spreading in two directions; their sheathing bases imbricated, and bordered with a long, thin, torn, stipulaceous membrane at each side. *Male flowers* small, whitish, in long, mostly branched, rigid-stalked spikes or clusters, separated into little whorl-like tufts, accompanied by brown scaly bractæas. *Female flowers* rather larger, in round solitary heads, terminating short leafy branches in the forks of the stem.

2. *X. mucronata*. Pointed Xerotes. Br. n. 2.—“Stem somewhat branched. Leaves shorter than the branches, but longer than the male spikes, two-ranked, straight, or slightly twisted; their points withering, acute; their margins roughish, with very minute teeth; dilated and entire at the base.”—Gathered by Mr. Brown, near Port Jackson, New South Wales, as well as the foregoing.

3. *X. collina*. Hill Xerotes. Br. n. 3.—“Leaves taller than the stem, narrow and straight; rough with marginal teeth; withering and very acute at the point; dilated and

jagged at the base. Head of female flowers sessile.”—Found by Mr. Brown, on the southern coast of New Holland.

4. *X. glauca*. Glaucous Xerotes. Br. n. 4.—“Leaves taller than the stem, narrow and straight; withering and bluntish at the point; rough with marginal teeth; dilated and jagged at the base. Tufts of flowers in the male spikes sessile.”—Gathered on the fourth coast of New Holland by Mr. Brown.

5. *X. leucocephala*. White-headed Xerotes. Br. n. 5.—“Male, as well as female, flowers capitate. Receptacle woolly. Leaves narrow, smooth-edged, longer than the perfectly simple stalk, bearing one or two heads of flowers. Stem short.”—Gathered by Mr. Brown, in the tropical part of New Holland.

SECT. 2. *Female flowers racemose or spiked; male ones racemose or panicled; partial stalks scattered; flowers drooping.*

6. *X. pauciflora*. Few-flowered Xerotes. Br. n. 6.—“Flowers few in the male cluster, in distant whorls. Leaves very narrow, acute and smooth; dilated and entire at the base; shorter than the divided stem.”—Found by Mr. Brown, near Port Jackson, New South Wales.

7. *X. filiformis*. Thread-shaped Xerotes. Br. n. 7. (*Dracæna filiformis*; Thunb. *Drac.* 4. t. 1. f. 1.)—Leaves thread-shaped, semicylindrical, elongated; flattened in front; rough-edged; finely striated at the back; round at the point. Male cluster scarcely branched. Stem short.—Gathered near Port Jackson, New South Wales, by Dr. White, and Mr. Brown. The root is woody. Stem scarcely any. Leaves several, a span or more in length, erect, rigid, very slender; flattened and whitish in front, with a green, striated, central furrow; convex at the back. We do not find that the point is always, as Mr. Brown says, round or cylindrical. Clusters much shorter than the leaves, branched in our specimens, as in Thunberg's figure, erect, lax, with rough stalks. Flowers scattered, or in pairs, drooping, whitish, small; the outer segments of the calyx smaller, and more membranous than the inner. Bractæas awl-shaped, acute, at the base of the partial stalks. Mr. Brown notices three varieties: α , male perianth nearly globular, twice the length of the partial stalk; β , male perianth nearly globular; partial stalk longer than that part, or the bractæas; γ , male perianth turbinate; partial stalk shorter than it, or the bractæas. The leaves seem variable in breadth and flatness.

8. *X. tenuifolia*. Fine-leaved Xerotes. Br. n. 8.—“Leaves thread-shaped, elongated; channelled in front; deeply striated at the back. Male clusters somewhat divided, their branches alternate. Stem short.”—Observed by Mr. Brown, on the southern coast of New Holland.

9. *X. gracilis*. Slender Xerotes. Br. n. 9.—“Leaves very long and narrow, channelled; striated beneath; flat and entire at the point. Male panicles lax, alternately branched; partial stalks solitary. Stem short.”—Found by Mr. Brown at Port Jackson.

10. *X. denticulata*. Small-toothed Xerotes. Br. n. 10.—“Leaves elongated, thread-shaped, compressed, channelled, with two or three terminal teeth. Male clusters simple or divided. Stem short.”—Gathered by Mr. Brown at Port Jackson. We have some specimens which answer to this description, in the teeth of their leaves, but they seem nearly akin to *X. filiformis* to be separated from that species, and they exactly accord with Thunberg's fig. 1, drawn from a dried specimen. We are not, however, certain of their being Mr. Brown's *denticulata*.

11. *X. lasca*. Loose-flowered Xerotes. Br. n. 11.—“Leaves elongated, linear, flat, entire at the point. Male panicles

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panicles loose, with whorled branches, and distant clusters; partial stalks solitary, shorter than the nearly globular perianth, but longer than their minute bractæa."—Gathered by Mr. Brown, in the same country with the two last.

SECT. 3. *Flowers either spiked or paniced, their branches and tufts opposite or cubored. Male perianths sessile, imbricated with bractæas. Capsule smooth. Leaves toothed at the end.*

12. *X. rigida.* Rigid Xerotes. Br. n. 12. Ait. Epit. 376. (Lomandra rigida; Labill. Nov. Holl. v. 1. 93. t. 120.)—Stem very short. Stalks and spikes much shorter than the foliage. Leaves two-ranked, cartilaginous; convex beneath; abrupt, with two marginal teeth, at the end; smooth at the edges; dilated and entire at the base.—Gathered by Mr. Brown in the southern part of New Holland. M. Labillardiere found it in Van Lewin's land. *Root woody. Leaves* a span in length, full a quarter of an inch in breadth, spreading in two directions, thick, rigid, smooth; greatly dilated, and bordered with a membrane, at the base; singularly abrupt, and three-pointed, at the end. *Common flower-stalk* terminal, thick, sharply two-edged, sometimes triangular, smooth. Tufts of *flowers* one above another, not numerous, forming an interrupted, branched, upright spike; each tuft accompanied by several unequal, lanceolate, acute bractæas. Three alternate *stamens*, according to Labillardiere, are longer than the rest, and bear cloven, not bordered, *anthers*.

13. *X. montana.* Mountain Xerotes. Br. n. 13.—“Stem none. Leaves elongated, linear, flat, membranous, smooth-edged; their sharp point with two very short lateral teeth. Female spike undivided, many times shorter than its stalk.”—Found by Mr. Brown, near Port Jackson.

14. *X. stuebelii.* River Xerotes. Br. n. 14.—“Stem none. Leaves elongated, narrow, channelled, smooth-edged, two or three toothed, with an acute sinus, at the extremity. Female spikes simple or divided. Bractæas rather rigid, twice as long as the tufts of flowers.”—Gathered by Mr. Brown in the same country, but, as appears by the name, in the vicinity of rivers.

15. *X. longifolia.* Long-leaved Xerotes. Br. n. 15. Ait. Epit. 376.—Stem none. Leaves elongated, linear, coriaceous, erect; irregularly toothed at the point; rough-edged. Panicles lanceolate, rather dense, with opposite branches. Flower-stalk flattish. Anthers uniform.—Gathered near Port Jackson, by Mr. Brown; at the Cape of Van Diemen, by M. Labillardiere. The *leaves* are a foot and a half long, somewhat striated; dilated at the base, and bordered in that part with a membrane, which at length separates, and becomes torn. *Stalk* from nine to twelve inches high, two-edged. *Flowers* more numerous and crowded than in *X. rigida*, n. 12, with long taper-pointed bractæas. *Capsule* ovate, acute, thrice as long as the calyx, chefnut-coloured; pale yellow at the base; its coat separating in irregular fragments.

16. *X. Hylrix.* Porcupine Xerotes. Br. n. 16.—Stem none. Leaves elongated, linear, lax, smooth-edged; somewhat toothed at the extremity. Stalk rather convex on both sides. Male panicles repeatedly compound, with whorled branches. Bractæas leafy, rigid, spinous-pointed.—Sent from the neighbourhood of Port Jackson, among the first botanical communications from thence, by Dr. White. It has also been gathered there by Mr. Brown. We have seen the living plant in some garden near London, possibly at Kew, and were much struck with the delightful fragrance of its copious panicles of male flowers, resembling the scent of *Crassula coccinea*, *Mesembryanthemum nodiflorum*, or a Bergamot Pear. Yet it does not occur in

Hort. Kew. The *leaves* are a foot and a half or two feet long, spreading. *Flower-stalks* of the male plant numerous, erect, two-edged, though convex at each side, from one to one and a half feet high, somewhat zigzag occasionally, each bearing a flattish panicle, from six to fourteen inches long, composed of numerous triangular branches, from four to eight in a whorl, beset with numerous tufts, or whorls, of sessile flowers, accompanied by several chaffy, inner bractæas, and subtended by about three long, spreading, external ones, with needle-like points. The *flowers*, and whole panicle, are of a delicate straw-colour, with a tinge of brown about the calyx or anthers. We have not seen the female plant. This species well deserves a place in the green-house, for the singularity of its appearance, as well as for its fine smell.

17. *X. arcuaria.* Sand Xerotes. Br. n. 17.—“Stem none. Leaves elongated, linear, smooth-edged, jagged and toothed at the end. Male panicle simple, with opposite branches. Tufts of flowers globose. Bractæas awl-shaped, reflexed. Flowers obtuse.”—Discovered in the tropical part of New Holland, by Mr. Brown.

SECT. 4. *Male panicle cubored. Flowers stalked, in drooping tufts. Capsule rugged. Leaves entire at the point.*

18. *X. difflans.* Distant-flowered Xerotes. Br. n. 18.—“Stem none. Leaves very long, channelled, very rough at the edges. Male panicle with undivided branches, and distant tufts of flowers. Partial stalks shorter than the calyx.”—Native of the tropical part of New Holland. The male panicles are a foot long; calyx about a line and a half. *Brown.*

19. *X. media.* Intermediate Xerotes. Br. n. 19.—“Stem none. Leaves very long, channelled, smooth-edged. Branches of the male panicle undivided. Flowers five or six in each tuft; their partial stalks scarcely so long as the very short calyx. Female spike divided in the lower part, each branch bearing one head of flowers.”—From the same country as the last. *Calyx* only one-third of a line in length; male panicle six inches. *Brown.*

20. *X. decomposita.* Compound Xerotes. Br. n. 20.—“Stem none. Leaves very long, channelled, smooth-edged. Male panicle repeatedly compound. Tufts of few flowers. Partial stalks hardly so long as the calyx.”—Found also in the tropical part of New Holland. Male panicles a foot long. *Brown.*

21. *X. multiflora.* Many-flowered Xerotes. Br. n. 21.—“Stem none. Leaves very long, channelled; smooth at the back and edges. Male panicle with undivided branches, each bearing from one to three many-flowered tufts. Partial stalks longer than the calyx.”—Found by Mr. Brown in the same country as the four preceding species.

22. *X. emula.* Rough-long-leaved Xerotes. Br. n. 22.—“Stem none. Leaves very long, channelled, erect; rough at the back and edges. Male panicle with undivided branches, each bearing from one to three many-flowered tufts. Partial stalks longer than the calyx.”—Found by Mr. Brown, in the country near Port Jackson, New South Wales. The roughness of the *leaves* seems chiefly to distinguish this species from the last. We have seen no specimens of either.

23. *X. Banksii.* Banksian Xerotes. Br. n. 23.—“Cauliscent. Leaves two-ranked, flat, rough-edged. Female panicle dense, about the length of its two-edged stalk; branches quadrangular, very short.”—Gathered by Sir Joseph Banks, in the tropical part of New Holland, where it was not found by Mr. Brown.

SECT. 5. *Flowers of each sex in a cylindrical catkin-like spike.*

24. *X.*

24. *X. bastilis*. Spear-stalked Xerotes.—“Stem none. Spike very long. Stalk round. Leaves elongated.”—Gathered by Mr. Brown, on the southern coast of New Holland. The habit of this species appears, by the above characters, to differ widely from the rest of its genus, rather approaching a *XANTHORRHOEA*. See that article.

XEROTRIBIA, formed of *ξρος*, dry, and *τριβω*, I rub, a term used by authors to express a dry friction, a rubbing of some affected part with the hand or otherwise, to recall the warmth and circulation.

XERTE, in *Geography*, a river of Spain, which passes by Placentia, and runs into the Alagon.

XERTIGNY, a town of France, in the department of the Vosges; 7 miles E. of Epinal.

XERUMENHA, or *JERUMENHA*, or *Gerumenha*, a town of Portugal, in Alentejo; 10 miles S. of Elvas. N. lat. 38° 35'. W. long. 6° 58'.

XERXENA, in *Ancient Geography*, a country of Asia, on the confines of Lesser Armenia, of which it makes a part. Strabo.

XERXES, in *Biography*, was the son of Darius I. by Atossa, the daughter of Cyrus; and on the death of his father, succeeded to the crown of Persia, in the year 485 B.C. Having in the second year of his reign subdued the revolted Egyptians, and committed them to the government of his brother Achæmenes, he determined to renew the invasion of Greece, in which Darius had been disappointed; and for the success of his expedition, he formed an alliance with the Carthaginians, on condition of their making an attack on the Greek colonies in Italy and Sicily, so that they might not have it in their power to assist the mother-country. His preparations were immense, and occupied several of the first years of his reign. Having provided a large navy, he formed a project of cutting a canal through mount Athos, of sufficient breadth to admit two galleys abreast; and to this undertaking, which some have regarded as a fiction, he devoted three years. He also constructed a bridge of boats across the Hellespont, in order to convey his army from Asia to Europe; and as the first bridge which had been laid was demolished by a storm, he not only manifested his childish rage by ordering 300 lashes to be inflicted on the sea, and a pair of fetters to be thrown into it, but his tyrannical and cruel disposition by beheading those to whom the conduct of the work had been committed. The number of sea and land forces which he employed in this expedition is said to have amounted to two millions and a half, to which we may add as many more attendants. When he ascended a high tower at Abydos, and took a view of the immense number that covered the sea and surrounding plain, his pride and triumph are said to have given way to tears, when the reflection occurred, that the brevity of human life was such as not to allow one of this countless host to survive the lapse of 100 years. Without detailing the events of this disastrous expedition, which are the proper subjects of history, we shall merely mention that it terminated in the defeat of Xerxes's navy at Salamis, and the subsequent overthrow and dispersion of Mardonius's army of 300,000 men; and specify some traits of the disposition and character of this ambitious despot. For his ignominious treatment of Leonidas, we refer to his article. Upon his taking possession of Athens, he wreaked his vengeance on the buildings and the temples, and dispatched a special messenger to his uncle Artabanus, to inform him of this inglorious triumph. Having erected a throne on a lofty mountain, in order to view the expected victory at Salamis, the event produced such consternation, that he suddenly left Mardonius and the army, and hastened to the Hellespont, where

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finding his bridge shattered by storms, but still haunted with terror, he intrusted himself in a fishing-boat, and hastened to Sardes; but when Mardonius was defeated, and all his hopes of conquering Greece were frustrated, he quitted Sardes, after having given orders for the demolition of all the temples in the Greek cities of Asia, and proceeded with all possible expedition to the Persian frontier. The other traces of his disgraceful expedition were the records of the cruelties and debaucheries exercised by himself and his family. So much at length did Xerxes become the object of contempt and hatred, that a conspiracy was formed among his own guards, which terminated in his murder during sleep, in the 21st year after his accession, B.C. 465. Herodotus. Diodorus. Anc. Un. Hist.

XESTA, *Ξῆστις*, an Attic measure of capacity, answering to the Roman sextary.

XESTES; an ancient Greek liquid measure, which is = 2 cotyli. See MEASURE.

XIAMETLA, in *Geography*, a town of Mexico, in the province of Xalisco; 30 miles S.E. of Purification.

XIASSI, a town of the duchy of Warsaw; 20 miles S.S.E. of Posen.

XIBACA, a town of Japan, in the island of Niphon; 120 miles S.W. of Meaco.

XICOCO, called also *Sikoko*, and *Sikokf*, an island of Japan, about 90 miles in length, and about half as many in breadth, divided into several provinces, situated near the south-west extremity of Niphon, from which it is separated by a strait, full of small islands, and to the north-east of Ximo. It has several convenient harbours, and many towns within the country. N. lat. 33° 30'. E. long. 132°.

XICONA. See *XIXONA*.

XILCA. See *CHILCA*.

XILOA. See *QUILOA*.

XILOCA, a river of Spain, which rises in the south part of Aragon, about 7 miles N.E. of Albaracin, and at Calataud changes its name to Xalon.

XILOTEPEC, a town of Mexico, in the province of Guatteca; 90 miles S.S.W. of Panuco.

XILVAN, a town of the principality of Georgia; 20 miles N. of Gory.

XIMABARA, a town of Japan, on the south coast of the island of Ximo, on a gulf to which it gives name; 33 miles E. of Nangafaki. N. lat. 32° 45'. E. long. 132° 7'.

XIMAGUINO, a town of Japan, in the island of Xicoco; 10 miles S. of Awa. N. lat. 33° 50'. E. long. 130° 30'.

XIMENA, a town of Spain, in the province of Seville. Near this town Cræfus is said to have concealed himself in a cave, till Marius and Cinna were overthrown by Sylla; 24 miles E. of Medina Sidonia.

XIMENES, FRANCIS, Cardinal, in *Biography*, was born in 1437, in Old Castile, and educated at Alcalá and Salamanca. Renouncing preferments which he obtained in his youth, he assumed the habit of St. Francis, in a monastery of the Observantines, one of the most rigid orders of monks in the Romish church. Distinguished by his austerities and devotional practices, he became confessor to queen Isabella; and still retaining his customary modes of living, he so far engaged her respect and attachment, that he was nominated by her to the archbishopric of Toledo, the richest benefice in Europe next to the papal see; but his real or affected reluctance to accept this high preferment could be overcome only by the authority of the pope. In this elevated station he maintained his strict adherence to the rigours of the order to which he belonged, and so far from relaxing

in his feverities, he indulged them to the extreme of self-mortification and penance. Having thus acquired a complete mastery over his own passions, and possessing political talents in a very high degree, he was thought peculiarly fitted to exercise dominion over others; and accordingly Ferdinand and Isabella entrusted him with a principal share in the administration. When a strong party was formed among the Castilians to deprive Ferdinand of the authority as regent, devolved upon him by the will of the queen, he was deserted by every person of distinction except Ximenes and two nobles; and after he had resigned it to the archduke Philip, he again acquired it upon Philip's death in 1506, by the influence of Ximenes. In 1507 Ximenes was created a cardinal by pope Julius II.; and in the following year he undertook the conquest of Oran, and of other places on the coast of Barbary, with an armament, the expense of which he offered to defray out of his own revenues, and he succeeded in this enterprise. Such was Ferdinand's confidence in the abilities and integrity of the cardinal, that when he was dying in 1516, he appointed him regent of Castile until the arrival of his grandson Charles. Although he was then in his 79th year, he took an active part in securing the throne to Charles, though in his own judgment he disapproved the king's conduct, who in his assumption of power contended the declared opinion of the Cortes. With no less firmness and inflexibility, he prosecuted a plan for extending the royal authority, which the nobility had very much circumscribed. The measures which he adopted for this purpose excited violent opposition, but he persisted, and ultimately succeeded. During his administration he was also engaged in two foreign wars; one for the preservation of the kingdom of Navarre, in which he was successful, and another against Horuc Barbarossa, who advanced himself from the condition of a corsair to the sovereignty of Algiers and Tunis, in which the Spaniards were totally defeated. When Charles was prevailed upon by Ximenes to visit Spain, the cardinal took a journey towards the coast to meet his majesty; but being disabled to proceed by the attack of a disorder, supposed to be the effect of poison, he requested an interview with the king; but Charles having conceived prejudices against him, returned a cold answer, with permission for his retirement to his diocese, that he might finish his days in tranquillity. In a few hours after the receipt of this letter, he expired November 1517, at the age of 80 years.

Ximenes was held in high estimation by his superstitious countrymen, under a delusive idea that he possessed the gift of prophecy, and a power of working miracles. But his more unequivocal claims to their respect were founded on his extraordinary talents and learning, his liberal patronage of literature, and the munificence of his public charities, to which he devoted the immense revenues of his archbishopric. At Alcalá he built the magnificent college of St. Ildefonso, endowed with forty-six professorships, and conducted under excellent regulations. Here he printed the Complutensian Polyglott, (see POLYGLOTT,) the Mozarabic liturgy, and the theological works of Toletus. Here he also established a splendid monastery for the education of indigent females of quality, which served as a model for that of St. Cyr, under Lewis IV. The granaries which he constructed remained without decay for centuries; and upon the whole he was justified in declaring on his death-bed, that to the best of his knowledge he had not misapplied a crown of his revenue. Robinson's Charles V. vol. ii.

XIMENES, in *Geography*, a town of Spain, in the province of Leon; 10 miles S. of Astorga.

XIMENESIA, in *Botany*, Cavan. Ic. v. 2. Co. Ait. Hort. Kew. v. 5. 85, a genus which can by no means be separated from PALLASIA. (See that article, n. 3.) Nothing can be more trifling as a generic, or even specific distinction, than the difference between the syngeneisous orders of *Polygamia-superflua*, and *P. frustifera*, of the Linnæan system, provided the form of the *flowers* be alike. The *pyxis*, of which rudiments are found in several genera of the latter, may occasionally become perfect, as it does now and then in *Helianthus*, and thus overlets the distinction.

XIMENIA, owes its name to Plumier, who consecrates this genus to the memory of the Rev. Father Francis Ximenes, a Spanish monk, one of the twelve Franciscan friars who first preached Christianity to the Mexicans. Being well skilled in the language of the country, he collected a great store of information concerning the properties and medical uses of the plants and animals of New Spain, and especially of Mexico; whence he composed a work, printed in four books, at Mexico, in 1615, which is quoted with approbation by De Laet, in many parts of his own publication. It is some consolation to find any of these apostles turning their minds to the study of their Maker's works; as we cannot suppose such to have been contaminated with that infernal spirit, which renders the whole history of the Spaniards in America a foul reproach to humanity, and to Christianity itself, so prostituted or so misunderstood!—Plum. Nov. Gen. 6. t. 21. Linn. Gen. 190. Schreb. 255. Willd. Sp. Pl. v. 2. 338. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 2. 352. Juss. 259. Lamarck Illustr. t. 297. Poir. in Lam. Dict. v. 8. 804.—Class and order, *Oëandria Monogynia*. Nat. Ord. *Aurantia*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, very small, in four pointed, permanent segments. Cor. Petals four, oblong; hairy internally; their lower half erect, forming a tube; their upper part revolute. Stam. Filaments eight, erect, short; anthers erect, longer than the filaments. Pist. Germen superior, oblong; style thread-shaped, the length of the stamens; stigma obtuse. Peric. Drupa nearly ovate. Seed. Nut solitary, roundish.

Ess. Ch. Calyx four-cleft. Petals four; hairy internally; revolute at the upper part. Drupa superior. Nut solitary.

Obs. Plumier's figure represents but three petals. Linneus has left a note, that his correspondent Allamand found but seven stamens. Swartz and Jacquin describe eight.

1. *X. americana*. Thorny Ximenea. Linn. Sp. Pl. 497. Hort. Cliff. 483. Willd. n. 1. Ait. n. 1. Swartz Obs. 149. (*X. multiflora*; Jacq. Amer. 106. t. 177. f. 31. *X. aculeata*, flore villosa, fructu luteo; Plum. Ic. 260. t. 261. f. 1. Heynall's spinosa; Aubl. Guian. 324. t. 125? and *H. inermis*; *ibid.* 325?)—Branches spinous. Leaves oblong. Stalks many-flowered.—Native of the neighbourhood of Carthagen, as well as of Hispaniola, flowering in September and October, and ripening fruit in December. *Jacquin*. Of the rocky shores of Hispaniola, flowering in July. *Swartz*. We believe Linneus never saw any specimen of this, except in Clifford's herbarium. That before us was given to the younger Linneus by sir Joseph Banks. Though Miller might have the plant at Chelsea in 1759, it would now probably be vainly sought for in any collection. The stem is either shrubby or arborescent. Young branches spinous, round, striated. Leaves two or three together, in alternate tufts, from buds of many years' duration, stalked, elliptic-oblong, obtuse with a minute point, rarely emarginate, entire, single-ribbed, smooth on both sides, about two inches long. *Footstalks* quarter of an inch

inch long, smooth. *Thorns* lateral, erect, longer than the footstalks, awl-shaped, stout, but sparingly produced. *Flower-stalks* axillary, or rather from the same bud as the leaves, not half their length, deflexed, round, divided into from three to five smooth, single-flowered partial stalks. *Calyx* spreading quadrangular. *Petals* four, whitish, flaggly from the base almost to the apex, on the infide; smooth externally. *Fruit* the size of a small apple, yellow when ripe. Jacquin says the pulp is sweetish, eaten by children and negroes, and that the smell of the *flowers* is extremely sweet, as well as powerful, something like burnt frankincense. Aublet compares them to cloves. His figure, if it belongs to the same plant as ours, is very faulty; but we rather presume it must be a species nearly akin, whose *flowers* are really axillary, and, like the *fruit*, only one-third the size of the Linnæan plant; their *petals* finely downy, not shaggy, all over their inner surface. Still, without seeing a specimen, we dare not describe it as distinct.

2. *X. elliptica*. Elliptical Ximena. Forst. Prodr. 27. Willd. n. 2.—“*Thorns* none. Leaves elliptic-lanceolate. Stalks many-flowered.”—Found by Forster in New Caledonia. This is known only by the above characters, which are not so discriminative as could be wished, the *thorns* being variable in the original species, and in the plant of Aublet.

3. *X. inermis*. Jamaica Ximena. Linn. Sp. Pl. 497. Willd. n. 3. (Amyris? arborefcens, foliis ovatis glabris, vetustioribus confectis; petiolis submarginatis; floribus solitariis; Browne Jam. 209.)—“*Thorns* none. Leaves ovate. Stalks single-flowered.”—Native of Jamaica. Browne describes it as a bushy tree, not above eight or nine feet high; its *trunk* about four and a half inches in diameter. *Leaves* oval, not above an inch long, standing very thick upon the smaller branches. *Petals* hairy on the infide towards the base. *Drupa* ovate-oblong.

M. Poiret describes, in Lamarck's Dictionary, a plant by the name of *X. ferax*, n. 3, which we can scarcely refer to this genus; the *flowers* being five-cleft; *petals* linear, smooth on both sides; and *stamens* prominent. This is a spinous shrub, found in Hispaniola, with nearly orbicular, coriaceous leaves, above an inch long, and either solitary or umbellate axillary flowers. The *thorns* are three or four inches long, very sharp, sometimes leafy.

Jussieu speaks of a *X. egyptiaca*, as described in the *Species Plantarum* of Linnæus, though omitted subsequently in his *Systema*. We are unable to discover this, and Jussieu, like Calpar Bauhin, unhappily omits to cite pages. We do, however, find in Linnæus's copy of Plumier's *Genera Plantarum*, which once belonged to the French botanist Inard, a note of the latter under *Ximena*, that “the *Agibahid* of Alpinus, *Pl. Egypt.* 38, appears to belong to this genus.” The rude wooden cut does indeed countenance such an opinion, especially the *flowers*; but the author compares the *fruit* to that of *Sambucus Ebulus*, describing it moreover as bitterish and astringent. Now *Sambucus* has nothing in common with *Ximena*. The plant of Alpinus, which was brought from Ethiopia, may be a thorny *Lycium*, but we cannot refer it to any known species.

XIMO, or KRUSU, in *Geography*, an island of Japan, and second in size and eminence, situated to the S.W. of Niphon, from which it is divided by a narrow channel. Its circumference is supposed to be upwards of 300 miles, exclusive of the bays and creeks. It has considerable numbers of cities and towns, with some good harbours. N. lat. 32° 40' to 34°. E. long. 130° 50' to 133° 30'.

XIMONOSEQUI, a sea-port town of Japan, on the

S.W. coast of Niphon, with a good harbour, capable of containing 300 vessels. It is a place of trade, and surrounded with walls. N. lat. 33° 56'. E. long. 132° 20'.

XINGU, a river of South America, which rises somewhere near S. lat. 17°, and is first called “Paranatinga;” it afterwards takes a northerly course of about 900 miles, and runs into the Amazons river, 20 miles E. of Paru, in the government of Para.

XIPHIAS, $\chi\phi\iota\alpha\varsigma$, the name of the sword-fish; which see. This fish is cut in pieces by the Sicilians, and salted. The process was anciently performed particularly at the town of Thurii, in the bay of Tarentum, and hence the fish was called “Tomus Thurianus.” (Plin. l. 32. c. 11.) Besides the Xiphias Gladius, described under the article SWORD-FISH, Dr. Shaw has enumerated some other species, such as the following:—

PLATYPTERUS, or sword-fish with extremely broad back-fin, and very long sharp-pointed thoracic appendages; the *Guebucu* of Marcgrave, and *Scomber gladius* of Black. This species, in the appearance of the long and sharp-pointed process of the upper jaw, is nearly allied to the common sword-fish, but in other respects materially differs from it. It is found twenty feet in length, and sometimes much longer. Its general colour is a silvery blueish-white, except on the back, head, tail, and fins, which in the living animal are of a deep blue. The strength of this fish is such, that it pierced the bottom of an East Indian ship with such force as completely to imbed its snout almost to its base; and if it had not been killed by the violence of the effort, but had been able to withdraw its snout, the ship must have been leaky, and thus have foundered. This power of transfixing vessels is mentioned by Pliny. This fish is found not only in the Brazilian and East Indian seas, but also in the Northern ocean; and it is said to be a great enemy to whales, with which it has frequent combats. Dr. Black says, that when this species does not exceed four feet in length, it is considered as an eatable fish; but when it exceeds that length, it is too coarse.

MAKAIRA, the blackfish sword-fish with snout of middling length, and two bony tubercles on each side of the tail. This is a species lately discovered, and described by Cope under the title of “Makaira.” This fish was cast on the ile of Rhé, near Rochelle in France. Its length was 330 French centimetres, and its weight 365 kilogrammes; its colour was blackish. It was eaten by many of the inhabitants of Rochelle, and found to be tolerable food, though somewhat dry; the flesh was white. The “round-snouted sword-fish” is also described by Cope, from the sword or snout preserved, with the fore-part of the head, in the Paris Museum. Shaw's Zoology, vol. iv. part i.

XIPHIAS is also used to express a fiery meteor, in form of a sword. See ACONTIAS.

XIPHIAS, in *Astronomy*. See DORADO.

XIPHIDIUM, in *Botany*, from $\chi\phi\iota\varsigma$, a sword, alluding to the sword-shaped leaves. The name occurs in Pliny, and was adopted by Loefling for the present genus, which Linnæus, in publishing Loefling's papers, sunk in IXIA (see that article); but subsequent writers have restored it, the *germen* being superior, and the *corolla* of six separate petals.—Schreb. Gen. 37. Willd. Sp. Pl. v. 1. 248. Vahl Enum. v. 2. 162. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 1. 107. Aubl. Guian. 33. Swartz Ind. Occ. 79. t. 2. Juss. 59. Lamarck Illustr. t. 36.—Clafs and order, *Triandria Monogynia*. Nat. Ord. *Enfateæ*, Linn. *Iridibus affinis*, Juss. *Hæmodoraceæ*, Brown?

Gen. Ch. *Cal.* none. *Cor.* inferior, of six petals, regular, permanent; the three outer ones largest. *Stam.*

Filaments three, linear, opposite to the three inner petals; anthers ovate. *Pist.* Germen superior, globose; style thread-shaped; stigma simple. *Peric.* Capsule at first fleshy, then dry, roundish, with three furrows, and three cells. *Seeds* numerous, roundish, pointed, inserted into a fleshy, central, nearly globular, receptacle.

Eff. Ch. Corolla regular, of six petals. Capsule superior, of three cells, with many seeds.

Obs. The regularity of the *flower* readily distinguishes this genus from *WACHENDORFIA*. See that article.

1. *X. floribundum*. Many-flowered *Xiphidium*. Swartz *Prodr.* 17. *Ind. Occ.* 80. Vahl n. 1. (*X. albidum*; Lamarck *Illust. v. 1.* 131. *X. album*; Willd. n. 1. *Ixia*; Linn. in *Loeff. It.* 179.)

2. *X. ceruleum*; Aubl. *Guian.* 33. t. 11. Willd. n. 2. Ait. n. 1.—Native of South America, as well as of Tobago and St. Kitt's. Mr. Masson is recorded by Dr. Swartz as having gathered the white-flowered kind, α , at the foot of some hills, near Sandy Point, in the last-mentioned island: β was found in Guiana, by Aublet. We have a specimen of the latter from Miller's herbarium, gathered in some part of South America. The root is perennial, somewhat creeping, jointed. *Stem* a foot or more in height, round, simple, as thick as the little finger; leafy in the lower part; more or less minutely hairy. *Leaves* numerous, alternate, sessile, somewhat sheathing, sword-shaped, pointed, entire, or minutely serrated, striated with numerous longitudinal ribs. *Cluster* compound, terminal, erect, of many spreading, simply racemose, branches, more or less hairy, with a very minute *bractea* under each partial flower-stalk. *Flowers* not half an inch in diameter. Three outer petals green, and often downy at the back; white or blue in front, as the three inner ones are on both sides.

Swartz and Vahl have united the two supposed species of other authors. The latter asserts the blue-flowered variety to be sometimes entirely smooth in its leaves as well as flowers.

XIPHILINUS, JOHN, in *Biography*, was born at Trebizond, in the 11th century, and having passed the earlier period of his life in a monastery on mount Olympus, was advanced to the patriarchate of Constantinople, which office he held till his death in 1075. Besides a sermon printed in the *Bibliotheca Patrum*, he is reputed by some to be the author of an "Abridgment of the History of Dion Cassius," in Greek, written faithfully, which was printed at Paris in 1592, fol.

XIPHION, or XIPHUM, in *Botany*, $\xi\phi\iota\omega\upsilon$ of Dioscorides, so called from the sword-shaped leaves, appears evidently, by the account of that ancient writer, to be *Gladiolus communis*, Linn. *Sp. Pl.* 52, our Common Corn-flag. *Xiphium* nevertheless is retained by Linnæus as the specific name of a common, but very elegant and fragrant bulbous *Iris*, with blue and yellow flowers. To this it seems he was led by Tournefort, who applies the name of *Xiphion* to the whole tribe of bulbous-rooted species of *Iris*, of which he makes a separate genus, characterized by the root. This is rather unfortunate, as the Linnæan *Iris Xiphium* has rather awl-shaped than sword-like leaves.

XIPHOIDES, $\xi\phi\omega\iota\delta\epsilon\varsigma$, in *Anatomy*, a cartilage placed at the bottom of the sternum, called also *ossiformis*.

It is about an inch long, and shaped like the point of a sword. Whence its appellation, from $\xi\phi\omega\iota\varsigma$, sword, and $\iota\delta\omega\varsigma$, figure.

XIPHONIE PROMONTORIUM, in *Ancient Geography*, a promontory of Sicily, near port Xiphonius.

XIPHOS, $\xi\phi\omega\varsigma$, among the Athenians, a capital punishment, by beheading with the sword.

XIPIXAPA, in *Geography*, a town of South America; in the audience of Quito; 80 miles N.W. of Guayaquil.

XIQUACAN, a town of Mexico, in the province of Mechoacan; 50 miles S.E. of Zacatula. N. lat. 18° 4'. W. long. 102° 34'.

XIQUENA, a town of Spain, in the province of Murcia; 15 miles W.N.W. of Lorca.

XIQUITO, a town of Japan, in the island of Ximo; 16 miles S. of Naka. N. lat. 32° 20'. E. long. 133° 13'.

XIR, a word used by the chemists to express mercury.

XISINUM, a word used by some of the chemical writers to express vinegar.

XIVERT, in *Geography*, a town of Spain, in Valencia; 7 miles N.W. of Segorbe.

XIVRY LE FRANC, a town of France, in the department of the Moselle; 9 miles S. of Longwy.

XIXONA, a town of Spain, in Valencia. In the neighbourhood of this town a great number of persons are employed annually to collect the drug called Kermes, and a small district, called *de la Grana*, produces some years to the value of 30,000 dollars; 13 miles N. of Alicante. N. lat. 38° 32'. W. long. 0° 42'.

XIZABRAS, mountains of South America, in the province of Venezuela.

XOANA, in *Ancient Geography*, a town of India, on this side of the Ganges.

XOCHIOCOTZO, in *Botany*, a name used by some authors for the tree which produces the liquid amber, and is called the sweet gum by the inhabitants of the West Indies.

XOCHITENACATL, in *Ornithology*, a name given by some to the toucan, or American great-beaked magpye.

XOCHITENACATL *Alia*, the name of a bird described by Nieremberg, of the nature of the toucan, or Brazilian magpye.

It is of the size of a pigeon; its beak is large and thick, and is black and pointed; its wings and tail are variegated with black and white; it has a large black mark reaching from its back to the breast; the anterior part of the wings is yellow; the rest of its body of a pale colour, and the legs and feet brown. It always is found among the sweet-flowering trees, and is not uncommon in many parts of South America. Ray.

XOCOTLAN, or XOCUTLÁN, in *Geography*, a town of Mexico, in the province of Xalisco; 15 miles S.W. of Purification.

XOCOXOCHITL, the Indian name of the clove-berry-tree, or the *castia caryophyllata*, the bark of which is used in medicine.

XODRACE, in *Ancient Geography*, a town of India, on this side of the Ganges. Ptolemy.

XOES, an island of the Mediterranean, on the coast of Egypt, near the mouth of the Nile, called "Xebenniticum;" and also a town of the same name. Steph. Byz.

XOIS, a town of Egypt, in the Nome, denominated Xoites Nomos. Ptolemy.

XOLA, in *Geography*. See SOOLOO.

XOLO. See GILOO.

XOMOTL, in *Ornithology*, the name of an American bird, of which the Indians are very fond, making a part of their garments of its feathers.

Nieremberg has given a short account of it. It is a web-footed fowl; its back and the upper part of its wings are black, and its breast is brown. When it is angry, it raises up the feathers of its head in form of a crest. Ray.

XORULLO,

XORULLO, or **JORULLO**, *Volcano of*, in *Geography*, a basaltic cone of New Spain, which appeared above ground on the 15th of September 1759, and which is at this day 249 fathoms or 1494 feet above the surrounding plain. It is situated in the province of Mechoacan, at the distance of eight leagues from Paquaro the capital, towards the S.W.; the volcano of Colima being in the same direction, but at a greater distance. A delicious and fertile vale, eight leagues in length from N. to S., and three in breadth, was called Xorullo by the Indians, a word in their language signifying *paradise*; but upon the eruption of the volcano, this valley assumed an infernal aspect, blackened with perpetual smoke, covered with deformed rocks and ashes, the trees consumed, the earth full of deep breaks and openings, and now forming a hill of considerable height, crowned with a volcano. A rivulet which fertilized the valley is now so hot as to burn men and animals who attempt to pass it, which is peculiarly inconvenient, as it is in the direct road to the copper-mines in this quarter. Before this catastrophe, there were constantly heard horrible subterraneous noises, and earthquakes were felt, which excited consternation in the inhabitants.

XOXOUHQUITICPATLI, an American name of a stone of the jasper kind, and of a beautiful green, but usually pale, and sometimes with a mixture of grey, and variegated in several places with spots of a deeper green.

It is found among the several kinds of *lapis nephriticus*, with which that country abounds, and most of which the Indians celebrate for their virtues against diseases; they are not, however, acquainted with any medicinal virtues of this species.

XV. VIR, *Quindecimvir*. See **QUINDECIMVIR**.

Authors, and especially antiquaries, make use of such abbreviations, which they borrow from medals, and other monuments of antiquity, where those names are so expressed.

XUAREZIA, in *Botany*, according to De Theis, is a genus dedicated, in the *Flora Peruviana*, p. 20, to Gaspar Suarez, a Spanish botanist, who has devoted himself to the study of the plants of Italy.

XUCAHA, or **XUCAAH**, the name of a plant much famed for its virtues among the ancient Arabians, but unknown at this time.

XUCAR, in *Geography*, a river of Spain, which rises in New Castile, and runs into the Mediterranean, 20 miles S. of Valencia.

XUCHES, or **ZUCHS**, in *Ancient Geography*, a town of Africa, in Libya. Steph. Byz.

XULI, in *Geography*, a town of Peru, in the diocese of La Paz, near the west coast of lake Titicaca, chiefly inhabited by Indians, and governed by Indian magistrates; 100 miles N.N.W. of La Paz. S. lat. 16° 25'. W. long. 70° 6'.

XULI, a small island in the Pacific ocean, near the coast of Peru. S. lat. 16° 50'.

XULLA, or **XULLOE**, an island in the East Indian sea, about 42 miles long, and from 10 to 15 broad. The English some years since formed a settlement in this island, but from the badness of the soil, and some other circumstances, they were induced to abandon it, and remove to Balamangan, on the coast of Borneo. S. lat. 1° 53'. E. long. 125°.

XULLABELLA, an island in the East Indian sea, about 25 miles long, and 6 broad. S. lat. 2° 15'. E. long. 126° 12'.

XULLAMANGOLA, an island in the East Indian

sea, about 30 miles long, and 10 broad. S. lat. 1° 54'. E. long. 125° 42'.

XUN, a city of China, of the second rank, in Se-tchuen; 150 miles S.W. of Pao-king. N. lat. 30° 18'. E. long. 103° 20'.

XUNDALE, a town of South America, in the province of Popayan; 8 miles S.W. of Sante Fe de Antioquia.

XUQUI. See **JUGUI**.

XUTHIA, in *Ancient Geography*, a country of Sicily. Diod. Sic. It is represented as a town by Steph. Byz.

XUXUY, in *Geography*, a town of La Plata, which chiefly trades in cattle, sold to the miners of Potosi, and brought in considerable number to the great fair of Salta; but now in a declining state. See **JUJUY**.

XYLAGIUM, a name given by some authors to the lignum sanctum, or guaiacum.

XYLANDER, **WILLIAM**, in *Biography*, whose family name was *Holtzmann*, was born in indigent circumstances at Augsburg, in 1532, and enabled by public liberality to study at Tubingen and Basil, in the latter of which places he took the degree of M.A. in 1556. In 1558 he was invited to undertake the Greek professorship at Heidelberg; where, with all the disadvantages of penury, he pursued his literary labours, and acquired an amplitude of erudition, which comprehended the learned languages, history, poetry, music, philology, and physics. The works by which he is chiefly known are Latin translations, (with notes,) of Dion Cassius, Plutarch, Strabo, and Cedrenus. His life was prematurely terminated in consequence of hard study, in 1576, at the age of 44 years. Moreri.

XYLARIA, in *Botany*, from *ξύλον*, wood, a name given by some cryptogamic botanists to the first section of the genus *SPHERIA* in Persoon. (See that article.) The idea appears to have been suggested by the old name of *Hypoxylon*, belonging to one of the species. But it may also apply to the woody and durable texture of that and some others of the same section.

XYLENOPOLIS, the *Town of the Woods*, in *Ancient Geography*, a town of India, at one of the mouths of the river Indus, according to Pliny, who reports that it was built by Alexander. M. D'Anville thinks that this town is the same with Hiyala. It subsisted in the time of Pliny.

XYLINA, **IXIL**, a town of Asia, in the Colchide, and country of the Lazii. It was situated on the right bank of the Acinsas, near its mouth in the Euxine sea, north of Chordyla.

XYLINE, a town of Cappadocia, in Cappadocian Pontus. Ptol.

XYLINES, a people of Africa, in Libya interior, E. of the Agagines, from the foot of mount Arvalle, as far as mount Arangas. Ptol.

XYLO-ALOE, compounded of *ξύλον*, wood, *άλος*, aloes, in *Medicine*, the lignum aloes; called also *agallochum*. See **ALOE**, and **CALAMBAC**.

XYLO-BALSAMUM, *Ξυλοβαλασμῶν*, compounded of *ξύλον*, wood, and *βάλσαμος*, balsam, a name which naturalists, &c. give to the wood of the tree, which yields that precious gum known to the Latins by the name of *opobalsamum*, and, among us, by the name of *balsam*, or *balm of Gilead*.

We have branches of this tree brought from Cairo. They are very straight, brittle, unequal, and full of knots; their bark is reddish without, and greenish within. The wood is whitish, and full of pith; and, when broken,

broken, yields an agreeable smell, resembling that of the balsam.

The *xylo-balsamum* is reputed good to strengthen the brain and stomach, and to expel poison.

XYLOCRACTA, or **XYLOCRACTE**, in the *Materia Medica*, a name by which some few authors have called the carob, or filiqua dulcis, the sweet pipe-tree.

This was called by some of the Greek writers *xyloceraton*, the tree bearing pods, and from a corruption of this name the other has been formed.

XYLOCARPASUM, in *Natural History*, a name given by some authors to a poisonous kind of wood.

It was the wood of that tree whose gum was called *carbasum* and *apocarpasum*.

XYLOCARPUS, in *Botany*, from $\xi\upsilon\lambda\omicron\varsigma$, wood, and $\kappa\alpha\tau\alpha\omicron\varsigma$, fruit, alluding to the woody texture of the seed-vessel.—“Koenig in *Naturf.* v. 20. 2.” Schreb. *Gen.* 253. Willd. *Sp. Pl.* v. 2. 329. Mart. *Mill. Dict.* v. 4. Poir. in Lamarck *Dict.* v. 8. 806.—Clafs and order, *Oandria Monogynia*. *Nat. Ord.* *Tribilata*, Linn. *Melia*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, club-shaped, coriaceous, somewhat coloured, with four roundish teeth. *Cor.* Petals four, ovate-oblong, rather coriaceous, widely spreading, twice the length of the calyx. Nectary erect, ovate, inflated, somewhat fleshy, with eight marginal segments. *Stam.* Filaments no other than the eight segments of the nectary, linear, obtuse, emarginate, shorter than the petals; anthers eight, attached to the inner side of the filaments, and of the same length, linear-oblong, abrupt. *Pist.* Germen superior, ovate, smooth, slightly rugged at the base; style very short and thick; stigma abrupt, broad, bordered, its margin furrowed, its disk furrowed cross-wise, and perforated. *Peric.* Drupa large, globose, dry, with a thick coat; externally smooth, marked with four or five furrows; internally woody and fibrous. *Seeds.* Nuts eight, ten, or more, angular, unequal, irregular; their outer skin soft, and rather silky; inner woody and fibrous; kernel in some degree woody, brittle, with a prominent embryo.

Ess. Ch. Calyx oblong, with four teeth. Petals four. Nectary inflated, with eight teeth bearing the anthers. Drupa superior, dry, woody, with four or five furrows. Nuts numerous, angular, irregular.

1. *X. Granatum*. Indian Wooden-pomegranate. Koenig as above. Willd. n. 1. (*Granatum littoreum*; Rumph. *Amboyn.* v. 3. 92. t. 61. *Cadul gaba* of the natives of Ceylon. *Candalanga* in the Tamul language.)—Native of muddy thickets on the sea-shores of Amboyna, Ceylon, and other parts of the East Indies, among *Rhizophora* trees, flowering in November, and bearing fruit in January and February. A tree varying greatly in size, sometimes little more than a shrub; its wood elegantly veined, but so twisted and knotty, that no large handsome pieces can be procured. The trunk is erect, with a hard, deeply cracked bark; the head dense, roundish, or oblong. Larger branches scattered; smaller generally opposite, numerous, clothed with a greyish bark. Leaves opposite, stalked, spreading, oblong, obovate, or elliptical, acute, entire, rather larger than those of an apple-tree; dark-green, smooth and shining on the upper side; veiny beneath, with a prominent midrib. Footstalks short, roundish, spreading, a little curved, rugged, of a chestnut-brown. Clusters scattered or axillary, stalked, rather spreading, shorter than the leaves; their subdivisions opposite, or three-forked, with round, smooth, red, tough, naked stalks; the ultimate ones shorter than the flowers, which are small, yellowish, or dirty white. Their nectary somewhat resembles a Lily of the Valley, but these

flowers have no smell. The fruit is larger than a pomegranate, sometimes the size of a child's head of three years old, and contains from eight or ten to twenty angular unequal nuts, bigger than chestnuts, which do not appear to be used as food. There is a very remarkable disproportion between the magnitude of the flowers and fruit. Rumphius, from whom, as well as from Koenig, we take our description, hints that the flowers are perhaps dioecious. It is certain that most of those, so numerous in each cluster, must be abortive, or there would not be room for the fruit.

XYLOCASIA. See **CASSIA**.

XYLOCOCUM, in the *Materia Medica*, a name given by some of the later Greek writers to the carob-tree, or filiqua dulcis.

XYLOCOLLA, a word used by some of the ancient writers to express what was more usually called *taurocolla*, glue made of the ears and genitals of a bull.

XYLOCOPIA, $\xi\upsilon\lambda\omicron\kappa\omicron\upsilon\pi\omicron\upsilon\epsilon$, among the Greeks, a punishment with a cudgel. See **FUSTIGATION**.

XYLODON, in *Botany*, from $\xi\upsilon\lambda\omicron\varsigma$, wood, and $\omicron\delta\omicron\upsilon\varsigma$, a tooth, an appellation given by Perfoon to the third section of his genus *SISTOTREMA*, *Syn. Fung.* 550. (See that article.) The lamelle of that genus, (which is intermediate, as he justly says, between *Boletus* and *Hydnum*, though, in our opinion, most akin to the latter,) are of a firm, woody, and durable nature, and divided into many compressed irregular teeth.

XYLOGLYCON, a name given to the carob, or filiqua dulcis, by some of the old Greek writers.

The word expresses a sweet or sweet-fruited tree.

XYLOIDES, or **HYLOIDES**, a term used by many of the ancient writers to distinguish those plants which had woody stalks, though they never grew up to any considerable size; such as the garden-thyme, marjoram, and the like.

XYLOMA, so called from the firm or woody substance of the whole fungus, and the jagged or radiating margin of one of the most common species, *X. acerinum*; the word being apparently composed of $\xi\upsilon\lambda\omicron\varsigma$, wood, and $\lambda\omicron\mu\omicron\varsigma$, a fringe, or border.—*Perf. Syn. Fung.* 103. *Obf. Mycol.* v. 2. 100.—Clafs and order, *Cryptogamia Fungi*. *Nat. Ord.* *Fungi Angiocarpi*.

Ess. Ch. Flat, nearly orbicular. Receptacle various, hard, somewhat fleshy internally; either remaining closed, or bursting unequally.

Sect. 1. Compound. Several receptacles combined. Rather large.

1. *X. salicinum*. Sallow-leaf Xyloma. *Perf. n. 1.* “*Disp. Meth.* 5. t. 2. f. 4.”—Thick, tuberculated; internally cartilaginous, and white at the base.—Frequent on the leaves of *Salix caprea*. This, according to Perfoon, is generally closed, but he has found it in the spring, as delineated in the work quoted, breaking, in the upper part, into several portions, like the shell of a tortoise, from whose interstices the fine powdery seeds flew off like smoke. The breadth of the whole fungus is about half an inch; its colour black.

2. *X. andromeda*. Marsh-rosemary Xyloma. *Perf. n. 2.*—“Oblong, thickish, with rib-like elevations, polished.”—Found in summer on the leaves of *Andromeda polifolia*, which hence appear as if pitch had been dropped upon them. Sometimes each fungus is as long as the whole leaf; sometimes only half as long. Its thickness is considerable with regard to the size. The lower stratum is white and firm, as in the foregoing.

3. *X. acerinum*. Maple Xyloma. *Perf. n. 3.* (*Sphæria maculiformis*; Ehrh. *Crypt. n. 219.* *Beitr. v. 7. 101.*)—Dilated, somewhat orbicular, thin, flat, black, slightly corrugated towards the centre.—Frequent on the leaves of

Acer platanoides, and *A. campestre*, in the autumn. It consists of numerous, black, opaque, inseparable patches, scattered over the upper side of the leaf, each about a quarter or one-third of an inch in diameter; the margin sometimes variously and elegantly notched, or fringed, and always circumscribed by a very striking yellow, or tawny, discoloration of the leaf. Perfoon says he has observed the surface of this species, though usually almost even and uniform, cracking into waved bordered fissures. We can see something of this in a specimen from professor Schrader.

4. *X. punctatum*. Sycamore Xyloma. Perf. n. 4. Obf. Mycol. v. 2. 100.—Dilated, thin, imperfectly orbicular, somewhat convex, black. Receptacles unequal, aggregate, parallel, oblong, blunt, superficial.—Frequent on the fading or fallen leaves of *Acer Pseudoplatanus*, which are rarely without this parasite in autumn and winter. The patches are from half an inch to an inch wide, closely united with the leaf, slightly convex above, and rather concave at the under side, which is somewhat blackened by them, especially at the circumference of each. The wrinkles, or receptacles, are shaped like the clefts of an OPEGRAPHA (see that article); but much more shallow, as well as more uniform in colour.

5. *X. stellare*. Starry Xyloma. Perf. n. 5. Obf. Mycol. v. 2. 100.—“Thin, pithy; the margin fringed with radiating fibres.”—Found by Perfoon, on the leaves of *Phytolium spicatum*, though rarely. About half an inch broad, more or less, of a handsome appearance, with an uniform smooth disk, very black; the marginal fringe either black, or greyish. No distinct receptacles have yet been noticed.

6. *X. ? rubrum*. Red Xyloma. Perf. n. 6. Obf. Mycol. v. 2. 101.—“Aggregate, orbicular, somewhat confluent, red.”—Generally found in autumn on the leaves of *Prunus domestica*, rarely on *P. spinosa*. At first sight the red colour of this species, all the others being black, causes it to be taken for an *Ecidium*, or *Uredo*; but on examination the internal substance proves to be solid, uniform, scarcely containing distinct receptacles, or seed-vessels; its genus, however, is reckoned by Mr. Perfoon as very doubtful. The patches are each from two to four lines broad, rather thick, with darker-coloured superficial dots, visible only with a microscope. Perfoon.

Set. 2. Simple. Receptacles solitary, scattered; generally rounded, like a *Peziza*; or dot-like. Smaller.

7. *X. pezizoides*. Cup-like Xyloma. Perf. n. 7. (*Peziza comitatis*; Sowerb. Fung. t. 118. *P. viridis*; Bolt. Fung. t. 109. f. 1.)—Rather crowded, orbicular, black; opening at length, with an upright, somewhat crenate border, and a pale olive or greenish disk.—Found on fallen leaves of oak in December; more rarely, and in less perfection, on those of beech. The specimens are pretty uniform in size, larger than mustard-seed, closely attached to the surface of the leaf; the border of each sometimes pale, sometimes black, unless Sowerby and Bolton describe two different species.

8. *X. spherioides*. Dot-like Xyloma. Perf. n. 8.—“Scattered, dot-like, softish, with an open disk, and a collapsed inflexed border.”—On the leaves of *Salix caprea*. This at a distance resembles *Sphaeria punctiformis*; but under a magnifier it looks like some *Peziza*, with a crisped margin. The outside is black; the disk, rarely all displayed, is paler.

9. *X. hysterioides*. Oblong Xyloma. Perf. n. 9. “Ic. et Descr. Fung. t. 10. f. 3, 4.”—“Elliptical, thin, ranged nearly parallel.”—On the fallen leaves of Hawthorn, in the spring. Each plant is one-third of a line long, ovate, or

elliptical, of a shining black; solid within. A longitudinal line seems to mark the place where it finally bursts.

10. *X. fuliginum*. Willow Xyloma. Perf. n. 10. (“*Sphaeria fuliginosa*; Ehrh. Crypt. n. 299.”)—“Aggregate and rather crowded, orbicular, thin, with a somewhat convex disk.”—On the leaves of *Salix caprea*, occupying nearly their whole surface. Each individual is from one-third to one-half a line broad.

11. *X. populinum*. Aspen Xyloma. Perf. n. 11.—“Aggregate, flattened, variously shaped, smooth, opaque, black.”—Found on the old leaves of *Populus tremula*, in the spring. About a line broad; the disk here and there greyish.

12. *X. concentricum*. Concentric Xyloma. Perf. n. 12. Obf. Mycol. v. 2. 101.—“Simple. Receptacles small, orbicular, depressed, somewhat conical, concentric, of a foxy grey.”—On half-decayed leaves of *Populus tremula*, forming circular patches, near an inch broad. Receptacles like small scattered dots, at first black, afterwards foxy or greyish, bursting finally at the summit.

13. *X. fagineum*. Beech Xyloma. Perf. n. 13. “Disp. Meth. Fung. 52.”—“Minute, crowded, of a shining black, orbicular, plaited, a little depressed.”—Found on the under side of fallen and dried leaves of Beech, in the form of crowded black dots.

14. *X. alneum*. Alder Xyloma. Perf. n. 14.—“Minute, scattered, roundish, plaited.”—This species is met with in summer, upon Alder-leaves, while they are still green. It consists of a few black distant dots.

These minute productions are necessarily very obscure in their characters and economy. The present genus is marked by its internal solidity, of a corky or woody substance, having nothing of a gelatinous nature, nor are there any distinct round capsular receptacles, as in SPHERIA. See that article.

XYLOMELUM, so called by the writer of this, from *ξύλον*, wood, and *μήλον*, an apple, in allusion to the hardness and form of the fruit, which procured it, when first discovered, the appellation of the wooden pear.—Sm. Tr. of Linn. Soc. v. 4. 214. Mart. Mill. Dict. v. 4. Brown Prodr. Nov. Holl. v. 1. 387. Tr. of Linn. Soc. v. 10. 189. Ait. Hort. Kew. v. 1. 212.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceae*, Juss. Brown.

Gen. Ch. Cal. none. Cor. Petals four, regular, equal, linear; externally hairy; a little dilated and concave at the tip; revolute soon after expansion. Nectary four glands at the base of the germen. Stam. Filaments four, very short, inserted rather above the middle of each petal, and becoming prominent by its recurvature; anthers linear, inflexed, of two lateral parallel lobes, with a membranous edge; imperfect in some of the flowers. Pstl. Germen superior, roundish; style erect, rigid, the length of the petals, deciduous; stigma vertical, club-shaped, obtuse, often small and abortive. Peric. Follicle woody, very thick, ovate, of one excentric small cell, and bursting into two divaricated half valves, at the point. Seeds two, roundish, compressed, each with a terminal, oblong, rather oblique, membranous wing, as long as the follicle.

Eff. Ch. Petals four, bearing the petals above the middle, regular, revolute. Nectariferous glands four. Stigma club-shaped. Style deciduous. Follicle woody, of one excentric cell, with two winged seeds.

1. *X. pyriforme*. Wooden-pear. Brown n. 1. (*Banksia pyriformis*; Gärtn. v. 1. 220. t. 47. f. 1. Lamarec Illustr. v. 1. 242. t. 54. f. 4. White's Voyage 224. t. 21. *Hakea pyriformis*; Cavan. Ic. v. 6. 25. t. 536.)—Gathered on the eastern coast of New Holland, near Port Jackson, by the first settlers in that colony. We received specimens from

Dr. White,

Dr. White, in 1789 and 1793. Mr. Brown says it grows on stony hilly ground. This, the only known species, is a tree, with opposite branches; and downy and rusty when young. *Leaves* opposite, stalked, five inches long, lanceolate, acute at each end, entire, rather coriaceous, smooth, with one rib, and many prominent reticulated veins; pale and yellowish beneath; clothed, when they first come out, with dense, deciduous, rusty down: those of young plants, according to Mr. Brown, are toothed. *Footstalks* flattish, an inch long, smooth. *Stipular* none. *Spikes* axillary, opposite, catkin-like, cylindrical, dense, much shorter than the leaves, many-flowered, thaggy with rusty down. *Flowers* sessile, hardly an inch long, in pairs, each pair accompanied with one small downy *bractea*; all of them abortive, except the lowermost, so that from specimens seen in fruit only, the flowers were judged to be solitary. The *fruit* is ovate, or inversely pear-shaped, very hard, even, downy, two or three inches in length. *Seeds* and their wings brown. Mr. Brown remarks, that the greater part of the *flowers*, having a small *stigma*, and no *germen*, are necessarily abortive. Many of the *anthers* too have, as above-mentioned, an imperfect appearance; but having never seen living flowers, we cannot tell whether this be an original defect, or merely owing to their having long ago performed their office. It is possible that the rusty hue of the flowers and young leaves, so rich and beautiful in our specimens, may partly, if not altogether, be owing to drying. This plant, though procured for Kew garden, by Sir Joseph Banks, in 1789, appears never yet to have bloomed there.

XYLON, is so well described by Pliny, book 19, chap. 1, as to leave no doubt of its being our Cotton. (See Gossypium.) He says it served to make the choicest garments of the Egyptian priests. Dr. J. R. Forster, the famous botanist and circumnavigator, published in 1776 a most learned little volume, to prove Cotton the true *Byssus* of the ancients. See also Matth. Valgr. v. 1. 376.

XYLON, *Ξυλον*, among the Athenians, a punishment inflicted, by putting the offender into the stocks.

XYLOPHYLLA, in *Botany*, very expressively named by Linnæus, after Rumphius, from *ξύλον*, wood, and *φυλλον*, a leaf, in allusion to the hardness and rigidity of its foliage, which indeed serves the purpose of both leaves and flower-stalks.—Linn. Mant. 147. Schreb. Gen. 200. Willd. Sp. Pl. v. 1. 1500. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 336. Juss. 387. Poiret in Lamarek Dict. v. 8. 812. Lamarek Illustr. t. 855. Gært. t. 108. (Phyllanthus; Browne Jam. 188.)—Class and order, *Monocotyledonæ*. (Pentandria Trigynia; Browne, Linn. Schreb. Willd.) Nat. Ord. *Tricocca*, Linn. *Euphorbia*, Juss.

Gen. Ch. Male. *Cal.* Perianth in six deep regular segments; the three innermost largest. *Cor.* Petals none, unless the calyx, or its inner segments, be taken for such. Nectary of six globular glands. *Stam.* Filaments united into a very short column; anthers three or six, roundish; two-lobed.

Female, on the same plant, and in the same situation, as the male. *Cal.* and Nectary as in the male. *Pist.* Germen superior, sessile, roundish; styles three, short, spreading; stigmas three-cleft. *Peric.* Capsule roundish, with three furrows, three cells, and six elastic valves. *Seeds* two in each cell, roundish.

Eff. Ch. Male. Calyx in six deep segments; three of them interior. Petals none. Nectary of six globular glands.

Female, Calyx and Nectary like the male. Styles three.

Stigmas three-cleft. Capsule of three cells, with six elastic valves. Seeds two in each cell.

Obf. Dr. Sims, in Curt. Mag. 1021, has justly indicated this genus as too near *PHYLLANTHUS* (see that article); where the *seeds* are erroneously said to be solitary. Whether the difference between their *nectaries* be permanent, we have not seen enough to determine. At any rate, these two genera must stand next to each other, in the Linnean artificial system, as well as in every natural one.

1. *X. ? longifolia*. Long-leaved Sea-side Laurel. Linn. Mant. 221. Willd. n. 1. Swartz Obf. 112. (Xylophyllus ceramica; Rumph. Amboyn. v. 7. 19. t. 12.)—Leaves linear, alternately toothed. Flowers solitary at each tooth.—Found only on the lofty, stony, cold mountains of the island of Ceram. The *trunk* is shrubby, scarcely so thick as a man's arm, dividing above it into many round branches, as thick as the finger. These end in numerous, alternate, drooping, long, linear, acute leaves, or perhaps winged branches, with blunt alternate teeth, usually an inch distant from each other. The *flowers* are solitary, nearly sessile, at each notch. Of their structure nothing is known; nor of the *fruit*, except what Rumphius relates, and this, as Dr. Swartz observes, does not agree with the genus before us, Linneus having merely adopted this remarkable plant as a *Xylophylla*, on account of its habit, which is striking enough. Rumphius says, "the calyx resembles a small clove, and is red, bearing a roundish-oblong fruit, resembling a Bay-berry, or the *Abrus* of Alpinus, (and Linnæus), green, hard, with a small point. When opened, a small nucleus is found, resembling a grain of rice, fixed on the stalk, and tasting sweet, like a Filiberd, being enclosed in a white skin." It is very unlikely that the kernel of any species of this genus should be eatable.

2. *X. latifolia*. Broad-leaved Sea-side Laurel. Linn. Mant. 221, excluding the synonym. Willd. n. 2. Ait. n. 1. Swartz Obf. 113. Curt. Mag. t. 1021. (Genesiphylla asplenifolia; L'Herit. Sert. Angl. t. 39. Phyllanthus n. 1. Browne Jam. 188. Hemonitidi affinis, americana epiphyllanthos, &c.; Pluk. Phyt. t. 36. f. 7.)—Leaves rhomboid, crenate; notches crowded, each bearing one or more stalked flowers.—Native of lime-stone rocks, near the sea-side, in the West Indies. Mr. Waller is recorded in Hort. Kew. as having first sent this elegant and singular shrub to his friends in England, in 1783. If we mistake not, the marquis of Rockingham, who died in 1782, received it from Mr. Waller some time before; the original having been long one of the dowager marchioness's finest plants. It flowers in a stove copiously in August and September. The *stem* is four or five feet high, with a round bushy head. *Leaves* a foot long, alternate; stalked, alternately pinnate; leaflets twelve or more, nearly sessile, one and a half or two inches long, ovate-rhomboid, acute, hard and rigid, erect, striated, smooth; entire towards the base. *Flowers* copious, small, green, on simple crimson stalks; those of the female flowers much the longest. Both *stamens* and *pistil* sometimes occur in the same flower, according to Dr. Swartz.

3. *X. Arbuscula*. Lanceolate-leaved Sea-side Laurel. Swartz Prodr. 28. Willd. n. 3. (Phyllanthus speciosa; Jacq. Coll. v. 2. 360. Ic. Rar. t. 616. Swartz Ind. Occ. 1107. Schneev. Ic. t. 30?)—Leaves pinnate, lanceolate, pointed, crenate; notches crowded, each bearing one or more stalked flowers.—Native of the sloping sides of lofty mountains, in the fourth part of Jamaica. Swartz. We can discern no real specific difference between this and the last. The leaves indeed are narrower, more elongated and less falcate, but those characters vary. Dr. Swartz

XYLOPHYLLA.

lays 3 strels on the flowers being polygamous in *latifolia*, monoecious in *Arbutifolia*; but nothing is more variable than this circumstance. It is difficult to say which of the two Schneevoght's figure represents.

4. *X. falcata*. Sickle-leaved Sea-side Laurel. Swartz Prodr. 28. Willd. n. 4. Ait. n. 2. Andr. Repof. t. 331. (*Phyllanthus Epiphyllanthus*; Linn. Sp. Pl. 1392. *Ph. americana* planta, flores e singulis foliorum crenis profrens; Comm. Hort. v. 1. 199. t. 102.)—Leaves scattered, linear-lanceolate, somewhat falcate, distantly toothed. Flowers nearly sessile, many together at each tooth.—Native of the Bahama islands. Cultivated for above 120 years past in the stoves of England and Holland, flowering in July and August. The stem is five or six feet high, shrubby, with round branches. Leaves not pinnate, with a flat stalk, as in the two last, but scattered irregularly over the branches, each proceeding from a scaly bud, simple, five or six inches long, one-third of an inch wide, rigid, striated, tapering at each end; entire towards the base; alternately toothed in the upper part, the teeth an inch or more asunder. Flowers crimson, on short stalks, some male and some female in each tuft; the latter fewest.

5. *X. angustifolia*. Narrow-leaved Sea-side Laurel. Swartz Prodr. 28. Willd. n. 5. Ait. n. 3. (*X. elongata*; Jacq. Hort. Schoenbr. v. 3. 53. t. 348. Poirer n. 7. *Phyllanthus* n. 2; Browne. Jam. 188. *Ph. americana*, angustiori et longiori folio, ramosa, caulescens; Pluk. Phyt. t. 247. f. 4. *Ph. angustifolia*; Swartz Ind. Occ. 1111.)—Leaves pinnate, linear-lanceolate, rather distantly toothed, scarcely curved. Flowers on short stalks, polygamous, one or more from each tooth.—Native of stony rocky situations, in the western part of Jamaica. Swartz. Cultivated in the English stoves before 1789, flowering in July and August. Aiton. This agrees with our second and third species, in having several alternate leaflets, on a flat or channelled, bordered common stalk; but scarcely half so many on each stalk as in those; and of a longer narrower form, not copiously crenate, but sparingly and rather distantly toothed, more in the manner of *X. falcata*. The stem is only two feet high. The flowers are less copious than in the last-mentioned species, and, according to Dr. Swartz, there are some perfect, intermixed with the male and female ones. Their colour is red; the male ones palest. (Jacquin's figure expresses the contrary.) Plukenet's engraving, such as it is, manifestly agrees with this species, and with no other. Linnæus, no doubt, confounded this, and, at one time, the *latifolia* also, with the *falcata*. Browne's synonyms are settled by his own species, though unmarked.

6. *X. linearis*. Linear Sea-side Laurel. (*X. angustifolia* β; Swartz Prodr. 28. Willd. n. 5. *Phyllanthus linearis*; Swartz Ind. Occ. 1113.)—"Leaves pinnate, linear, tapering, pliant, crenate; their common stalk bordered. Flowers several from each notch."—Native of shady stony banks of rivers, in the western part of Jamaica. Swartz. The stem is scarcely a foot high, erect, with round branches. Common footstalks four or five inches long, scattered, compressed, (rather depressed,) bordered. Leaves linear, rather broadest in the middle; tapering at the base; ending in a very long acute point, striated, paler beneath, two inches long, of a thinner substance than the foregoing species, which circumstance, added to its humbler figure, and different colour, has induced Dr. Swartz to consider it as distinct. The flowers are white, monoecious, from three to six at each notch of the leaves, on capillary stalks, four lines in length.

7. *X. montana*. Mountain Sea-side Laurel. Swartz

Prodr. 28. Willd. n. 6. (*Phyllanthus montana*; Swartz Ind. Occ. 1117.)—Leaves somewhat two-ranked, elliptic-lanceolate, coriaceous, deeply crenate. Flowers nearly sessile, many from each notch. Branches round; two-edged at the extremity.—Found on lime-stone rocks, in the western part of Jamaica. A shrub, six feet high, much and irregularly branched; the branches often forked, round, nearly erect, with annular scars; ultimate ones permanent, glaucous-ashcoloured, compressed and two-edged at the summit. Leaves alternate, imperfectly two-ranked, nearly sessile, either blunt or acute, obliquely striated, rigid, brownish-green, smooth, with deep many-flowered notches. Flowers monoecious; the males eight or ten, pale red; females solitary among the males, deep purple. Clearly distinguishable from all the species which it otherwise resembles, by the permanency, and woody texture, of the ultimate branches. Swartz.

8. *X. ramiflora*. Siberian Sea-side Laurel. Ait. Hort. Kew. ed. 1. v. 1. 376. ed. 2. n. 4. Willd. n. 7. (*Phar-naceum*? *suffruticosum*; Pallas It. v. 3. 716. t. E. f. 2.)—Leaves elliptical, stalked. Flowers axillary.—Native of the deserts of Siberia, from whence it was procured for the English gardens, in 1783, by the late Mr. Bell. It is a hardy shrub, flowering in July and August. Pallas, who never saw the plant alive, merely guessed at its genus. By his figure, its habit is altogether that of a *Phyllanthus*. The stem is bushy, with many straight, wand-like, leafy branches, each a span long. Leaves scattered, thin, hardly an inch in length, blunt, crenate, or somewhat wavy. Flowers six or eight together, making a little axillary tuft, accompanied by minute red stipules, or bractæ. Segments of the calyx five, concave, white, with a coloured margin. Anthers five, thick, obtuse, furrowed at the outside. Germen in the same flower, as we presume from Pallas's description, very small. Styles three, thread-shaped, simple, the length of the stamens. The genus of this species is, at best, very doubtful, as Willdenow has already remarked.

Phyllanthus and *Xylophylla* are so totally different in habit, and the latter is, in this respect, so very peculiar, that a clear character between them is much to be desired. The true *Xylophylla* are all of West Indian origin. The tropical *Phyllanthi* are natives of the East Indies; a few hardy species grow in North America.

XYLOPHYLLA, in Gardening, contains plants of the tender exotic kind for the stove, in which the species cultivated are, the long-leaved love flower (*X. longifolia*), the broad-leaved love flower (*X. latifolia*), and the falcated love flower (*X. falcata*).

The first is a branching angular plant, but the second has round branches; and the last is woody in the stems and branches.

Method of Culture.—These plants are increased by sowing the seeds in pots in the early spring, and plunging them in a hot-bed: when the plants are come up two or three inches in growth, they should be pricked out in separate pots, replanting them in the bark-bed: they may afterwards be managed as other stove-plants of a similar growth.

They are also, some of them, capable of being raised by off-sets, slips, and cuttings, assisted by a hot-bed in the same manner.

They require the constant protection of the stove in winter, but in the hot summer months may be set out in their pots in a sheltered situation, being taken in on the approach of cold nights.

They afford variety, and are curious in stove collections among other plants of similar growths.

XYLOPIA, in *Botany*, altered by Linnæus from *Xylopicium* of Browne, a name which the latter took from Plukenet, whose *Xylopicron*, formed from ξυλον and πιπερος, alludes to the bitterness of the wood. M. De Candolle, in following Linnæus, observes, that this abbreviation entirely destroys the sense. It certainly does to those who do not trace out the source of the word. If the original had been constructed in the most unexceptionable manner, we might have hazarded its restoration; but *Xylopi* is now too firmly established to be lightly disturbed, and in found nothing can be better.—Linn. Gen. 469. Schreb. 375. Willd. Sp. Pl. v. 2. 1270. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 3. 366. Juss. 284. De Cand. Syst. v. 1. 499. Poir. in Lamarck Dict. v. 8. 810. Lamarck Illust. t. 495. Gært. t. 69. (Xylopicron; Pluk. Almagr. 395. Xylopicium; Browne Jam. 250.)—Clafs and order, *Polyandria Polygynia*. (Gynandria Polyandria, Linn.) Nat. Ord. *Coadunata*, Linn. *Anonæ*, Juss. *Anonaceæ*, De Candolle.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in from three to five deep, broad, ovate, coriaceous, rather acute, permanent segments. *Cor.* Petals six, sessile, linear-lanceolate, coriaceous, much longer than the calyx; the three outermost largest. *Stam.* Filaments none; anthers numerous, oblong, quadrangular, abrupt, parallel, crowded, seated on the tumid, nearly globose, receptacle, in several rows. *Pist.* Germens several, on short stalks, compressed; styles tapering, crowded together; stigmas simple. *Peric.* Capsules several, stalked, coriaceous, compressed, bluntly angular, of one cell and two valves, bursting at the top. *Seeds* one or two, obovate, polished, tunicated at the base.

Eff. Ch. Calyx lobed, coriaceous. Petals fix; the three outermost largest. Capsules stalked, angular, compressed, of two valves. Seeds one or two, tunicated.

The plants composing this genus are trees or shrubs, with oblong or lanceolate (entire) leaves, and axillary, bracteated, simple or divided flower-stalks. The wood is bitter; bark and fruit aromatic. De Candolle, who describes eight species, of which the first is still the least understood.

Linnæus, by a misapprehension of the true character of his own class of GYNANDRIA, (see that article,) has placed this genus far afunder from *Anona*, *Uvaria*, &c., to which it is closely allied, both in natural and artificial distinctions. Few genera have hitherto been less understood.

1. *X. muricata*. Rough-fruited Bitter-wood. Linn. Sp. Pl. 1367. Willd. n. 2. De Cand. n. 1. Ait. n. 1. (*X. frutescens*; Gært. v. 1. 339. t. 69, excluding the synonym of Aublet. Xylopicium n. 1; Browne Jam. 250. t. 5. f. 2.)—Leaves ovate-lanceolate, pointed; clothed with close-pressed hairs beneath. Branches zigzag, nearly smooth. Stalks with several flowers. Fruit muricated.—Found by Dr. Patrick Browne, at the foot of the mountains, in Sixteen-mile walk, Jamaica. His specimen, drawn in the plate above-cited, is in our hands, but stripped of the leaves. This deficiency is supplied by another very large and perfect one, gathered in Jamaica, by Mr. Masson. The latter M. De Candolle unfortunately did not see, when the writer of this was favoured with too short a visit from this learned and amiable man. It is become necessary to correct some errors in the description, whose source is unknown to us. The leaves are certainly not "bearded at the point," nor do we perceive in what sense they are termed "strigose beneath." These are Willdenow's expressions, adopted by De Candolle. Sir Joseph Banks sent a living plant of this species to Kew garden, in 1793; but if it survives, it has not yet flowered. This is a small tree, fifteen

or twenty feet high, with alternate, round branches, zigzag when young, quite smooth, except towards the very extremity, which is slightly silky. Leaves alternate, on short thick stalks, spreading, rather ovate than lanceolate, with a blunt or emarginate, smooth point; their length two inches, or a little more; their margin entire, slightly revolute; their upper surface smooth and shining, reticulated with veins; under paler, more opaque, clothed with fine, scattered, close, silky hairs, after a while deciduous: mid-rib stout, rough with minute tubercles at the base. Flower-stalks copious, axillary, solitary, short, knotty, bearing from two to five flowers. Calyx three-lobed, scarcely downy. Petals: half an inch long, densely silky on both sides; the three innermost very narrow, triangular-awls shaped. Capsules, by Gærtner's account, which in the main agrees with that of Linnæus, nearly ovate, but angular and compressed, sometimes as many as fifteen, coriaceous, covered with little points, of one cell and two valves, containing one or two oval seeds, each with a cup-like tunic at the bottom. Browne made no remarks on the bark or wood of this tree. We perceive little bitterness in either, though some aromatic flavour in the bark. This species being the type of its genus, we have thought a full description requisite.

2. *X. frutescens*. Shrubby Silky Bitter-wood. Aubl. Guian. 602. t. 242, excluding the synonyms of Linnæus and Browne. Willd. n. 2. De Cand. n. 2. "Dunal Monogr. 120." Lamarck t. 495, copied from Aublet, excluding the fruit, which is Gærtner's figure of the foregoing. Poir. n. 2. (*X. fetosa*; Poir. n. 4, according to De Candolle. Embira seu Pindaiba; Pif. Bras. 71. Ibra; Marcgr. Bras. 99.)—Leaves lanceolate, pointed; glaucous and silky beneath. Branches silky. Stalks with few flowers. Capsules smooth.—Found by Marcgraf in Brasilia, flowering in February; by Aublet in Cayenne and Guiana, bearing flowers and fruit in August. M. De Candolle has examined a specimen, and we, having seen none, are obliged to rely on him and the other authors here cited for the specific distinctions between this and the first species. The smoothness of the fruit, the silkiness of the branches, and narrowness of the leaves, appear sufficient to ascertain the present plant. Marcgraf says the bark affords a tough kind of cordage. The fruit, equal in size to hazel-nuts, is aromatic and acid, serving, when powdered, instead of pepper.

3. *X. salicifolia*. Willow-leaved Bitter-wood. "Humb. and Bonpl. unpublished. Dunal Monogr. 121. t. 17." De Cand. n. 3.—"Leaves oblong, with a bluntish point; silky beneath. Stalks short, single-flowered; with small bractæas."—Found by the celebrated travellers baron Humboldt and M. Bonpland, near Espinal, in South America. A tree with blackish branches, marked with white dots. Leaves narrow, an inch and a half or two inches long, three or four lines broad, on short stalks, single-ribbed, without veins; smooth and green above; villous beneath, with close-pressed, silky hairs, of a rufous grey. Capsules from five to seven, gibbous, slightly pointed, not burlesing. Seeds one or two. De Cand.

4. *X. higykrisifolia*. Privet-leaved Bitter-wood. "Dunal Monogr. 121. t. 18." De Cand. n. 4.—"Leaves oblong, rather acute, smooth on both sides. Stalks short, with few flowers, and small bractæas."—Gathered by Humboldt and Bonpland, at Buga, in South America. The branches are round, blackish, rugged, rough with whitish points. Leaves an inch and a half long, four lines broad, on very short stalks, single-ribbed, veinless; somewhat shining above; paler beneath; the young ones silky at the under side. Stalks axillary, with three or four flowers, and roundish concave

cave *bracteas*. *Calyx* small, three-cleft. Three outer *petals* longest, spreading at the points. *Capisules* corrugated, not bursting. *Seeds* one or two. *Dunal*. *De Cand.*

5. *X. glabra*. Smooth Bitter-wood. Linn. Sp. Pl. 1367. Willd. n. 3. De Cand. n. 4. "Dunal Monogr. 121. t. 19." Lunan Hort. Jam. 97. (Xylopicrum n. 2; Browne Jan. 251. Xylopicron arbor, barbadensis *Bitter-wood*; Pluk. Phyt. t. 238. f. 4.)—Leaves ovate-oblong, pointed, quite smooth on both sides. Stalks single-flowered, solitary or in pairs. Fruit smooth.—Brought from Barbadoes by Mr. James Reede, who was sent to the West Indies by the earl of Portland, to procure plants for the royal garden at Hampton-Court. *Plukenet*. This species, therefore, may have been alive in England. Dr. Patrick Browne met with it in the mountains, at the back of Bull-bay, in Jamaica, where it grew to a considerable size, being fifty or sixty feet high. He never saw the flowers in perfection. "The wood, bark, and berries," says this author, "have an agreeable bitter taste, not unlike that of the orange-feed; and would probably prove excellent medicines. Wild pigeons feed much upon the berries, and owe their delicate bitterish flavour to this food. I have eaten many of the berries just off the tree, and found them agreeable to the palate, and grateful to the stomach. The bark and wood are agreeably bitter while fresh, but that delicacy diminishes greatly after they are dried. The wood is easily wrought, and good timber, but must not be exposed to the weather." *Browne*. Mr. Lunan, in his *Hortus Jamaicensis*, adds nothing to this account, but carefully distinguishes this Bitter-wood from QUASSIA, (see that article,) with which some persons have confounded it. M. De Candolle observes, that the *branches* of *X. glabra* are round, smooth, scarcely dotted; and that even the young *leaves* are smooth on both sides; the full-grown ones are two inches long, and one broad, obtuse with a point. *Calyx* smooth, with three very obtuse lobes. Unexpanded *petals* oblong, clothed externally with close-pressed pubescence, their length four lines. *Plukenet* represents the *flower-stalks* solitary, opposite to each leaf.

6. *X. nitida*. Shining-leaved Bitter-wood. "Dunal Monogr. 122. t. 20." De Cand. n. 6.—"Leaves oblong-lanceolate, smooth; polished on the upper side. Stalks branched, many-flowered. *Calyx* nearly entire."—Found by Joseph Martin, on the Oyac mountains of Cayenne, sloping down to the sea. A tree of a middling size, with straight, round, rugged, not hairy or downy, *branches*. *Leaves* somewhat elliptical, two or three inches long, and nine or ten lines broad; green, smooth, and very shining above; veiny, pale, and rather silky, with minute close hairs beneath; the margin a little revolute. *Clusters* small, corymbose, of four or five *flowers*, whose stalks are embraced by little roundish *bracteas*. *Calyx* coriaceous, brown, pitcher-shaped, scarcely divided. Bud of the *petals* oblong, triangular, acute. *Fruit* unknown. *De Cand.*

7. *X. acuminata*. Long-pointed Bitter-wood. "Dunal Monogr. 122. t. 16." De Cand. n. 7.—"Leaves oblong-elliptical, very long-pointed, perfectly smooth. *Capisules* on long stalks, single-valved, with two seeds."—Native of Cayenne. *Branches* round, rugged, smooth. *Leaves* on very short footstalks, four to six inches long, two inches wide, remarkably pointed, revolute, rather coriaceous; a little shining above. *Flowers* unknown. *Capisules* ovate, nine or ten lines in length, pointed, each tapering down into a long stalk, imperfectly bivalve, smooth and even. *Seeds* obovate, black, fœtid, convex at the outside, flat at the inner. *De Cand.*

8. *X. prinoides*. Winter-berry Bitter-wood. "Dunal

Monogr. 122. t. 15." De Cand. n. 8.—"Leaves oblong-lanceolate, smooth, membranous, pointed; bluntish at the extremity. *Flowers* solitary. *Capisules* with two valves."—Native of Cayenne. *Branches* wand-like, slightly rugged. *Leaves* on short stalks, smooth on both sides, three or four inches, (the author, by mistake as we presume, says three or four lines,) in length, and from twelve to fifteen lines broad; shining above; rather glaucous beneath. *Stalks* single-flowered, axillary, very short, each bearing an extremely minute *bractea*. *Calyx* deeply three-cleft. *Petals* ovate, acute, scarcely two lines long, being the smallest of this genus, or perhaps natural order. *Capisules* stalked, imperfectly bivalve. *Seeds* two, flat at the inner side, convex at the outer. *De Candolle*.

XYLOPICRUM. See XYLOPIA *supra*.

XYLOPOLIS, in *Ancient Geography*, a town of Macedonia, in Mygdonia. Ptolemy.

XYLOSMA, in *Botany*, from ξυλον, wood, and σμα, a smell, a name given by Dr. George Forster to the *Myroxylon* of his father; the latter appellation having been appropriated by Linnæus to a different genus. (See MYROXYLON.)—Forst. Prodr. 72. Schreb. Gen. 703. Willd. Sp. Pl. v. 4. 834. Mart. Mill. Dict. v. 4. Poir. in Lamarck Dict. v. 8. 817. Lamarck Illustr. t. 827. (Myroxylon; Forst. Gen. t. 63. Juss. 444. Lamarck Dict. v. 4. 192.)—Class and order, *Dioecia Polyandria*. Nat. Ord. uncertain. Juss.

Gen. Ch. Male, *Cal.* Perianth in four or five deep, roundish, minute, spreading segments. *Cor.* *Petals* none. *Nectary* minute, annular, finely crenate, surrounding the stamens. *Stam.* Filaments numerous (20—50), capillary, twice the length of the calyx; anthers roundish, small.

Female, on a distinct tree, *Cal.* as in the male. *Cor.* *Petals* none. *Nectary* as in the male, surrounding the germen. *Pist.* Germen superior, roundish-ovate; style very short, cylindrical; stigma obtuse, flat, obscurely three-cleft. *Peric.* Berry? dry, oblong, imperfectly divided into two cells by a partition from the bottom. *Seeds* two in each, triangular, convex at the back, flat at the sides.

Ess. Ch. Male, *Calyx* in four or five deep segments. *Petals* none. *Nectary* annular, crenate. *Stamens* from twenty to fifty.

Female, *Calyx* and *Nectary* as in the male. *Style* very short. *Stigma* slightly three-cleft. *Berry* dry, of two incomplete cells. *Seeds* two to each cell.

1. *X. suaveolens*. Serrated Sweet-wood. Forst. Prodr. n. 380. Willd. n. 1. (Myroxylon suaveolens; Forst. Gen. 63. n. 1.)—Leaves ovate, serrated.—Native of the Society islands of the South seas. The inhabitants employ this wood, to give a fragrant scent to cocoa-nut oil, for anointing their hair. We know not whether this be the precious Red Sanders Wood of the South sea islands, for a specimen of which we are indebted to Sir Joseph Banks, whose scent resembles that of the East Indian wood of the same name. The tree which produced it was, as long as possible, kept from the knowledge of our European voyagers.

2. *X. orbiculatum*. Entire-leaved Sweet-wood. Forst. Prodr. n. 381. Willd. n. 2. (Myroxylon orbiculatum; Forst. Gen. 63. n. 2.)—Leaves roundish, entire.—Native of Savage island. We have never seen a specimen of either species.

XYLOSTEON, a name by which some authors have called the small red-berried double-fruited *chamæcerasus*.

XYLOSTEUM, Dod. Pempt. 411. Tourn. 609. t. 379. Juss. 212. Pursh 161. (Chamæcerasus; Tourn. *ibid.*.) a word formed of ξυλον, wood, and στεον, bone, being synonymous with a Swiss name for the same shrubs, which

alludes to the hardness of their wood, and perhaps to its tubular form, filled with pith, as a bone is with marrow. The authors who retain this genus split the LONICERA of Linnæus, (see that article,) into several, without necessity or utility, offering, in our opinion at least, great violence to nature.

XYLOSTROMA, so called from ξύλον, *wood*, and στρώμα, *a stratum, or layer*, because this fungus forms indeterminate expansions, like cloth or leather, in the inside of the trunks or branches of trees.—Tode Fung. Mecklenb. v. 1. 36.—Clafs and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi angiocarpi*?

Eff. Ch. Expanded, coriaceous, two-fided, shapeless, concealed; surface smooth and even. Seminal globules very minute, attached to internal fibres.

1. *X. giganteum*. Oak Leather. Tode as above, t. 6. f. 51. Sowerb. Fung. t. 358. (Racodium *Xylostroma*; Perf. Syn. Fung. 702. Fungus coriaceus quercinus hæmatodes; Raii Syn. 25. "F. amplifsimus; Scop. Pl. Subterr. 116. t. 44." *Byssus candida* β; Lightf. Scot. 1004.)—This singular production is found in the centre of the trunks of growing oaks, spreading in the form of a piece of cloth or leather, with numerous ramifications, through some of the largest trees. But whether it is, like the *Boletus lachrymans*, or Dry Rot, in wrought timber, the cause of their decay, or its consequence, we have not sufficient information to decide. Tode's observations countenance the former opinion. He says the wood of the trees, occupied by this fungus, becomes rotten and perfectly dry. Its smooth surfaces are owing to the smoothness of the filures, through which it spreads in a tender state, and its branching indeterminate figure arises from the irregularity and subdivision of those filures. The inside is spongy, or partly hollow, occupied with branching fibres, bearing numerous little ovate capsules, or receptacles, whose apex appeared to Mr. Sowerby to have an opaque lid. The whole fungus is very durable, remaining unchanged for many years. Its hue is generally an uniform buff or pale tan colour; but Persoon notices a whitish variety, more compact than the usual kind; and a saffron-coloured one, found by Schrader. We cannot well reduce the *Xylostroma* to any other genus of this natural order. The *Racodium*, Perf. Syn. 701, defined as "expanded and soft, resembling cloth in its densely interwoven fibres," seems to us but a vague assemblage; the first species being *Byssus nigra*, which some make a *Lichen*, others a *Conserva*; the second a *Mucor*.

XYLOSTROTON, formed of ξύλον, *wood*, and στρωτος, *laid*, among the *Ancients*, an appellation given to Mosaic or chequered work.

XYLUS, in *Ancient Geography*, a town of Asia Minor, in Caria. Steph. Byz.

XYMETHUS, a town of Africa, in the interior of Cyrenaica. Ptol.

XYMPATHESIS, a word used by some of the old medical writers for sympathy.

XYNERESIS, formed of ξύς, or *σύν*, *together*, and *αίσιμα*, *I seize*, a word used by Hippocrates, and others of the ancients, to express a firm cohesion or connection of any two things. Some use it to express that firm shutting together, or clenching of the teeth, which happens in convulsions.

XYNIA, in *Ancient Geography*, a borough of Thessaly, on the confines of Perrhæbia, near a lake of the same name. Livy.

XYNOECIA, formed of ξύς, or *σύν*, *with*, and *οικία*, *I inhabit*, a feast among the ancient Athenians, instituted on occasion of Theseus's uniting all the petty communities of

Attica into one commonwealth; the assemblies of which were to be held at Athens, in the Prytaneum.

XYPHOID, in *Anatomy*, a name given to the cartilage, which forms the inferior extremity of the sternum. See the definition of the *sternum*, in the article *LUXES*.

XYRIS, in *Botany*, an ancient name, of unknown derivation, ξύρις, or rather ξυρίς of the Greeks, supposed to belong to our *Iris fœditissima*, transferred by Gronovius to the present genus, as one of nearly similar habit and characters. They are not, however, of the same natural order.—Linn. Gen. 29. Schreb. 39. Willd. Sp. Pl. v. 1. 254. Vahl Enum. v. 2. 204. Mart. Mill. Dict. v. 4. Brown Prodr. Nov. Holl. v. 1. 255. Pursh 33. Juff. 44. Kunth Nov. Gen. et Sp. v. 1. 255. Poiret in Lamarck Dict. v. 8. 818. Lamarck Illustr. t. 36. Gært. t. 15.—Clafs and order, *Triandria Monogynia*. Nat. Ord. *Enfate*, Linn. (rather *Tripetaloidæe*.) *Junci*, Juss. *Reftiaceæ*, Brown, Kunth.

Gen. Ch. (corrected from Brown and Gærtner), *Cal*. Perianth inferior, of three concave chaffy leaves; the outermost hooded, deciduous; the two lateral ones keeled, compressed, curved, acute, converging, permanent. *Cor*. Petals three, large, spreading, flat, crenate; with narrow claws, as long as the calyx. Nectaries three, feathery, alternate with the petals; suspected by Brown and Kunth to be barren stamens. *Stam*. Filaments three, inserted into the claws of the petals, much shorter than the limb, thread-shaped, erect; anthers oblong, incumbent. *Pist*. Germen superior, obovate, three-lobed; style one, thread-shaped, rather longer than the claws of the petals, three-cleft at the summit; stigmas obtuse, entire, or jagged. *Peric*. Capsule roundish, of one cell and three valves, with three more or less prominent receptacles, running down the middle of each valve. *Seeds* numerous, minute, roundish or elliptical, acute.

Eff. Ch. Calyx of three unequal leaves; the two lateral ones permanent. Petals three, equal. Nectaries three, feathery. Capsule superior, of three valves, with central receptacles. *Seeds* numerous.

A genus of perennial herbs, with fibrous roots. *Leaves* radical, numerous, sword-shaped, or thread-shaped; dilated, equitant, and membranous at the base. *Flower-stalk* perfectly simple, wrapped in a sheath at the bottom. *Head* terminal, solitary, its scales membranous, single-flowered, closely imbricated; the outer ones sometimes empty, and unlike the rest. *Anthers* posterior. *Brown*. *Flowers* almost invariably yellow.

Linnæus was acquainted with but one species, *X. indica*. Several others have been determined by various authors, inasmuch that Willdenow defines four, and Vahl ten in all. Mr. Brown has fifteen from New Holland alone, and there is a new one from South America. The author just mentioned divides this genus into two sections. Those species which belong to the first section have a capsule of one cell, whose receptacles are separate at the base; of these there are thirteen found in New Holland. The second section is characterized by a capsule incompletely divided into three cells, the receptacles being combined in their lower part. Of this there are two New Holland species. It is utterly impossible for us to follow this arrangement, few people having seen half the species in any state, much less their ripe capsules. We are possessed of ten, which appear to be distinct, and which can be referred, with tolerable certainty in general, to as many described species. For the remainder we shall cite our authorities.

1. *X. indica*. East India Xyris. Linn. Sp. Pl. 62, excluding the synonyms of Gronovius, Morifon, and Pifo. Linn.

XYRIS.

Itan. Zeyl. 14. Willd. n. 1. Vahl n. 1. (*Gladiolus indicus*, flore tripetalo; *Rudb. Elyf. v. 2. 17. f. 8.* *Gladiolo lacustris accedens malabarica, e capitulo botryoido florifera*; *Pluk. Almag. 170. t. 416. f. 4.* *Kotsjlettipullu*; *Rheede Hort. Malab. v. 9. t. 71.* *Ranmotha*; *Herm. Zeyl. 41.*)—Stalk furrowed, with many angles. Head ovate.—Native of the East Indies, and perhaps of Sierra Leone. The leaves are described by Vahl as sometimes a foot long, equalling the flower-stalks, lax, acute, almost the breadth of the nail; but he never saw any so broad as in Rheede's figure. The flower-stalks are several, rather more slender than a pigeon's quill, furnished with six or eight furrows, and twisted in the lower part. Head rather smaller than a Hazel-nut, with roundish scales. Our specimens, gathered by the late Mr. Smeathman at Sierra Leone, have no leaves, but the stalk and head answer exactly to the above description. The scales are from twenty-five to thirty in each head, rounded, or nearly orbicular, convex, closely imbricated, obtuse, brown, but little polished, divided lengthwise into three nearly equal spaces, or regions, (as is the case in most of the species that we have seen); the middle region here is slightly hoary or downy, the side-ones smooth. The flowers are pale. The head in these specimens is nearly globose; not oblong, as in Gertner's figure, marked *X. indica*. A few of the lowest scales are flatter and rather smaller than the rest, apparently always barren, or unaccompanied by flowers. Whatever Mr. Pursh's *X. indica* may be, it cannot belong to this species. He describes the leaves very long and grassy, twisted as well as the stalks.

2. *X. pubescens*. Downy-sheathed *Xyris*. Poir. n. 2.—“Stalk striated, almost cylindrical, enveloped in a downy sheath. Leaves greatly elongated.”—Received by professor Desfontaines, from the West Indies. Nearly related to *X. indica*, but differing in several characters peculiar to itself. The roots are long, as thick as the finger, with soft, rather fleshy, nearly simple, fibres, as thick as a raven's quill; and producing from the crown a great number of soft, flaccid, alternate, somewhat imbricated, very smooth leaves, a foot or foot and a half long, half an inch wide, entire, pointed; dilated at the base. Stalks straight, rather slender, twisted at the lower part, where they are each embraced by a cylindrical, striated, downy sheath, three or four inches long, terminating in a little short acute leaf. Head of flowers oval, obtuse, the size of a large pea, formed of numerous, imbricated, very close, unequal, whitish scales; the outer ones a little dilated, oval, nearly flat, scarcely pointed; the inner narrower, obtuse, rather concave. Poir. See our *X. anceps*, which has also a very long leafy-pointed sheath, but it is quite smooth.

3. *X. macrocephala*. Great-headed *Xyris*. Vahl n. 2.—“Stalk with one acute angle. Head and scales ovate; the latter grey at the back.”—Native of Cayenne. Described from the herbarium of professor Desfontaines. The leaves are eighteen inches long; as broad as the nail, or broader. Stalks taller than the foliage; round in the lower part; somewhat two-edged further up, with one convex and one acute side. Head when in fruit twice as big as a Hazel-nut, ovate, with obtuse scales. This differs from the rest in the breadth of its leaves, and the size of the head. Vahl.

4. *X. platycaulis*. Broad-stalked *Xyris*. Poir. n. 4.—Stalk compressed, dilated, striated, smooth; twisted below; with a lax, cloven, abrupt sheath at the base. Heads globose, abrupt at the summit.—Gathered by Commerçon in Madagascar. Leaves wanting in the specimens. Stalks a foot high; two or three lines broad. Sheath at least three inches long, smooth, striated, rather lax, cloven lengthwise,

obliquely truncated at the summit. Head hardly so big as a pea, flattish at the top, with broad, obtuse, concave, shining, chestnut-coloured scales, the outer ones keeled towards their point. Poir. We have enlarged the author's specific character from his own description, in order the better to contrast this species with the two following, with which it appears to agree in the flatness of the stalk.

5. *X. anceps*. Small-headed Two-edged *Xyris*. Lamarck *Illustr. v. 1. 132.* Vahl n. 3.—“Stalk two-edged, smooth. Head nearly globose.”—Native of Madagascar, and Malabar; perhaps also of Guiana. Leaves rather rigid, narrow, but one-third or one-fourth the height of the stalks, which are several, a foot or more in height, twisted, smooth, by no means striated. Head scarcely so large as a pea, with roundish, convex, hardly emarginate, scales. Petals yellow, finely toothed. Vahl. A Guiana specimen, communicated by Mr. Rudge, remarkable for the smallness of its head in proportion to the herbage, answers precisely in every point to Vahl's description. Aquatic, or marsh-plants, such as the species of this genus, are known to grow, more than any others, in widely distant and dissimilar parts of the world. We have suspected this Guiana specimen might be Poir. n. 2; but the sheath at the base of the stalk is not pubescent.

6. *X. complanata*. Flat-stalked *Xyris*. Brown n. 1.—“Stalk compressed flat, dilated, nearly straight; cartilaginous and rough at the edges, four times as long as the sword-shaped, straight, bordered, roughish leaves. Spike oblong or cylindrical. Scales orbicular, tumid.”—Gathered by Mr. Brown, in the tropical part of New Holland. The stalk is a line and a half broad. We have seen no specimen.

7. *X. feabra*. Rough *Xyris*. Br. n. 2.—“Stalk two-edged, twisted, with rather acute and rough angles. Leaves linear, roughish. Head ovate or oblong.”—From the same country. The stalk is hardly a line in breadth. Brown.

8. *X. levis*. Smooth *Xyris*. Br. n. 3.—“Stalk two-edged, smooth, as well as the narrow linear leaves. Head nearly ovate. Scales imbricated every way. Keels of the calyx-leaves fringed.”—Gathered by Mr. Brown near Port Jackson, as well as in the tropical part of New Holland. The stalks are from fifteen to eighteen inches high.

9. *X. americana*. Blue American *Xyris*. Aubl. Guian. 40. t. 14, very bad. Vahl n. 4. Symb. v. 3. 8. Willd. n. 3. Poir. n. 6. (*Jupicai*; *Pif. Bras. 238.*)—Stalk two-edged in the upper part. Head ovate-oblong. Scales polished, emarginate, with a small callous intermediate point.—Native of moist pastures in Brazil, flowering in the rainy season, according to Pifo, whose synonym was verified by Vahl, from an inspection of Marcgraav's herbarium. Aublet found the same in wet meadows near the river Macouria, in Guiana, flowering in December; but his figure is made up, as Vahl observes, with the leaves of an *Eriocaulon*; the scales of the head, and the flowers, being moreover very ill drawn. We have never met with a specimen answering to this species. Vahl says the leaves are grassy, narrow, and acute, half the length of the stalk, which is a foot or more in height; round in the lower part, with two prominent lines running down it; compressed in the upper part, and a little dilated under the head. The latter is obtuse, rather bigger than a pea. Scales oblong, concave, cloven at the point, with a brownish, rather callous point in the notch. Vahl. The corolla is said to be blue, of which we know no other influence in this genus.

10. *X. caroliniana*. Carolina *Xyris*. Walt. Carol. 69. Vahl n. 5. Poir. n. 7. Pursh n. 2. (*X. Jupicai*; *Michaux Boreal-Amer. v. 1. 23, according to Vahl.*)—“Stalk two-edged. Head ovate, acute.”—Native of Carolina.

XYRIS.

Carolina. *Vahl*. Found in low grassy fields, on a sandy soil, from New Jersey to Florida. Perennial, flowering from June to August. *Heads* small. *Flowers* yellow. It is extremely variable. *Pursh*. *Vahl* thought this species distinct from the last, in having more rigid leaves, and larger heads, which are acute, instead of being remarkably obtuse. The flowers moreover are yellow, not blue. The leaves vary in length. The heads in Lamarck's specimens are longer than those of Richard's. *Vahl*. We have not seen this species, but it seems that more than one may possibly here be confounded.

11. *X. torta*. Twisted-leaved Xyris. (*X. indica*; *Pursh* n. 1, excluding the synonyms.)—Leaves linear, spirally twisted, as well as the stalk, which is two-edged below, quadrangular at the upper part. Head globose. Scales polished, rounded, somewhat emarginate, pointlets, with a small silky disk.—Gathered in North America by Kalm. Linnæus confounded his specimens with *X. indica*, which he knew but imperfectly. They appear, however, to answer exactly to the *indica* of *Pursh*, who very properly gives an original specific character, instead of copying what did not agree with the plant before him. He found it in overflowed meadows, and small ponds, from Pennsylvania to Virginia; perennial, bearing yellow flowers in June and July. He calls the leaves "*longissime graminea*." In our specimens they are from one to ten inches long, a line broad, acute, many-ribbed, roughish at the edges, perfectly grassy; the outermost degenerating into broad, short, chestnut-coloured, pointed, imbricated scales. Stalks solitary, about two feet high; nearly round, though two-edged and striated, at the bottom, as well as very much twisted, even more than the leaves; the upper part is less so, more evidently two-edged; and towards the top there are four, not always equal, angles. Head the size of a large white currant, obtuse, of a shining chestnut-colour. Scales almost orbicular, convex; dilated and thin at the edges; marked at the back, just below the notch, with a pale, greenish, silky spot. Two or three of the lowermost of all are smaller, flatter, a little keeled.

12. *X. pusilla*. Dwarf Broad-leaved Xyris. Brown n. 4.—Stalk two-edged, smooth, like the short, sword-shaped, two-ranked, equitant leaves. Head orbicular, compressed, of a few shining, somewhat keeled and pointed, scales.—Gathered by Mr. Brown, in the tropical part of New Holland. Our specimens, in the herbarium of the younger Linnæus, were probably given to him when in England, by Sir Joseph Banks and Dr. Solander. The stalks are from two to six inches high, pale green, a little zigzag and twisted, somewhat quadrangular; sheathed at the base with one or two leaves, which, like those that grow from the root, are about an inch long, and two or three lines broad, slightly incurved at the point, of a pale rather shining green, with several ribs, and a finely dotted, or reticulated, surface in the dry state. Head the size of a pea. Scales orbicular, convex, of a shining chestnut-brown, pale at the edges; the two lowermost equal, without flowers, in an early state covering the whole head, and furnished with a strong, green, pointed keel.

13. *X. denticulata*. Tooth-leaved Xyris. Br. n. 5.—Stalk roundish, smooth. Leaves short, linear-awl-shaped; rough with minute marginal teeth. Head globose. Scales orbicular, shining, keeled at the summit.—Gathered in the tropical part of New Holland, by Sir Joseph Banks and Dr. Solander, who gave specimens to the younger Linnæus. This is about the size of the last, or rather taller. The root consists of very small fibres. Leaves from one to two inches long, not a line broad, their fine reticulations seeming to form the little teeth, at the margin and keel. Stalk

slender, striated or angular towards the top. Head twice the size of the last, of more numerous, bright-chestnut scales, with thin, pale, often jagged margins, and a little green short keel, or point, not extending beyond the scale. The two lowermost scales are barren, as in the preceding, and in a young state enclose the whole head.

14. *X. paludosa*. Bog Xyris. Brown n. 6.—Stalk roundish, smooth; angular at the top. Leaves somewhat tubular; that of the stalk longer than the sheath. Head nearly globular. Scales orbicular, shining, imbricated every way.—Found in the tropical part of New Holland, by Sir Joseph Banks and Dr. Solander. We have seen no specimen, nor did Mr. Brown himself meet with this or the last species, any more than with the *pauciflora* hereafter described.

15. *X. capensis*. Cape Xyris. Thunb. Prodr. 12. Fl. Cap. v. 1. 310. Willd. n. 4. Vahl n. 6.—Stalk solitary, thread-shaped, striated. Leaves linear, very short. Head ovate, acute. Scales ovate, obtuse, smooth.—Native of hills near Verkeerde valley, at the Cape of Good Hope, flowering in December. Stalk a foot high, or more, slender, smooth, very finely striated. Leaves few, radical, smooth, many times shorter than the stalk. Flowers yellow. *Stigmas* three, tumid, revolute, whitish. *Thunberg*.

16. *X. brevifolia*. Short-leaved American Xyris. Michaux Boreal-Amér. v. 1. 23. Vahl n. 7. Pursh n. 3.—Stalk thread-shaped. Leaves awl-shaped, compressed. Head globose. Scales oblong; the outermost narrowest, keeled.—Native of low boggy meadows, in Lower Carolina and Georgia; perennial, flowering in July. The smallest American species. Flowers yellow. *Pursh*. Leaves narrow, an inch and a half long. Stalk a span high, round and slender. Head the size of a black pepper-corn. Scales broadish-oblong. *Vahl*.

17. *X. pauciflora*. Few-flowered Xyris. Willd. n. 2. Phytogr. 2. t. 1. f. 1. Vahl n. 8. Br. n. 7.—Stalk quadrangular. Leaves linear; rough with minute marginal teeth. Head nearly globular. Scales shining, orbicular; spreading at the point, with a short triangular keel.—Gathered by Koenig and Rottler in the East Indies; and by Sir Joseph Banks, in the tropical part of New Holland. The root is a small dense tuft of pale fibres. Stalk from one to six or eight inches high, erect, straight, slender, striated, roughish. Leaves several, erect, sometimes nearly as tall as the stalk, grassy, very narrow, taper-pointed, striated, roughish, especially at the edges, where they are minutely toothed, or crenate, as in *X. denticulata*, n. 13. Head the size of a large pea. Scales chestnut-coloured, with a membranous, dilated, shining margin of a golden yellow, and each tipped with a green, triangular, projecting keel, or point, originating from the brown disk, but not extending beyond the membranous margin, with which it is incorporated. The prominence of this point, giving the head a squarrose aspect, is well expressed in Willdenow's, otherwise miserable, figure. The two lowermost scales are barren, and closely pressed to the next. *Corolla* linear.

18. *X. bracteata*. Bracted Xyris. Br. n. 8.—Stalk triangular. Leaves linear; their margins, and base of the keel, rough. Head roundish. Scales with a hoary disk, and brown membranous margin; the lower ones oblong, empty, with a linear disk.—Sent from Port Jackson, New South Wales, by Dr. White, in 1792. Mr. Brown found it in the same country, and we borrow from him the above characters of the leaves, wanting in our specimens. The stalk is a foot and a half high, slender and rushy, bluntly triangular, even, smooth to the touch, though Mr. Brown remarks that its most acute angle is roughish. Head rather
ovate

ovate than perfectly globose, one-third of an inch in length. Scales elliptical, abrupt, or partly emarginate; their disk elliptic-oblong, convex, not keeled, of a hoary or glaucous hue, finely dotted, not downy; their margin, at each side, about half as broad, membranous, of a shining brown, paler outwards. Three, four, or more, scales, at the bottom of each head, are destitute of flowers, shorter, much narrower, abrupt, oblong, not elliptical, with a peculiarly narrow disk, and have the appearance of bristles. Corolla rather large, yellow, turning white in decay.

19. *X. juncea*. Rushy Xyris. Brown n. 9.—“Stalk roundish, slightly compressed, rather zigzag, smooth as well as the awl-shaped leaves. Head globose. Scales ovate, undivided, imbricated every way; their disk of the same colour as the margin. Stigmas many-cleft.”—Gathered by Mr. Brown, in the neighbourhood of Port Jackson, New South Wales. The stalk is only eight or ten inches high. We have no specimens answering to the above characters.

20. *X. gracilis*. Slender Xyris. Brown n. 10.—“Stalk thread-shaped, smooth, scarcely twisted. Leaves linear, straight, rough-edged. Head oval, of few flowers. Scales imbricated every way; their disk hoary; margin blackish. Stigmas undivided.”—Sent from Port Jackson, in 1792, by Dr. White. Mr. Brown mentions only the fourth part of New Holland, and Van Diemen’s island, as the native country of this species, and yet we cannot refer our specimens to any other mentioned by him. Our plant is about half the size of *X. braſeata*, with fewer and paler flowers. Head small, elliptical, or obovate. Scales with a broad, hoary, or glaucous, disk, like that of the *braſeata*; but their membranous margin is of a darker brown, and, at the upper part of each scale, quite black, as if burnt. Several of the lowermost scales are smaller, linear-oblong, and of a more uniform brown. The stigmas are long, and undivided. Stalk somewhat compressed, seldom above a foot high; Mr. Brown says a foot and half.

21. *X. filiformis*. Thread-shaped Xyris. Lamarck Illustr. 132. Vahl n. 9. Poiret n. 9.—“Stalk thread-shaped, compressed. Leaves linear-awl-shaped, compressed, two-ranked. Head and scales elliptical; disk and margin uniform, with slight traces of a keel.”—Gathered by the late Mr. Smeathman, as well as by Dr. Adam Afzelius, in marshy sandy ground at Sierra Leone. The root is small and fibrous. Leaves four or five, seldom more, equitant, erect, linear-sword-shaped, compressed, very narrow, tapering, but rather obtuse at the point; their surface minutely speckled, and more or less evidently reticulated, or dotted; their length, in our specimens, from one to two inches; Vahl says scarcely half an inch. Stalk solitary, six or eight inches high, very slender. Head the size of hemp-seed, but more oblong, acute at each end, of a copper-brown, not very shining; the two lowest scales empty, rather palest, most oblong, and strongly keeled; the rest elliptical, bluntly pointed, very smooth and even, without any limited disk, but sometimes marked with beautiful concentric veins; their keel scarcely discernible, except in the form of a short pale elevation, near the apex, but not projecting into a point. Corolla yellow, small.

22. *X. flexifolia*. Wavy-leaved Xyris. Br. n. 11.—“Stalk thread-shaped, twisted, smooth, as well as the zigzag, slender, slightly compressed, leaves. Head oval, with few flowers. Stigmas undivided.”—Found by Mr. Brown, on the southern coast of New Holland. Stalk from six to twelve inches high.

23. *X. teretifolia*. Cylindrical-leaved Xyris. Br. n. 12.—“Stalk, as well as the leaves, round, straight, and roughish. Head ovate, many-flowered. Scales imbricated every way, torn into many segments.”—From the same country. Stalk eighteen inches high. Brown.

24. *X. lacera*. Jagged-headed Xyris. Br. n. 13.—“Stalk round, smooth. Head nearly globular, many-flowered. Scales imbricated every way, torn into many segments.”—Discovered by Mr. Brown, on the fourth coast of New Holland. We have seen no specimens of this, or the two species immediately preceding.

25. *X. subulata*. Awl-leaved Peruvian Xyris. “Fl. Peruv. v. 1. 46. t. 71. f. b.” Vahl n. 10. Kunth n. 1.—“Stalk thread-shaped; roughish at the top. Leaves linear-awl-shaped; their sheaths woolly at the margin. Head oblong, about three-flowered.”—Native of marshy, cool, highly elevated, mountainous situations, in Peru, flowering in September. Root perennial. Plants growing together in patches. Leaves about an inch long; villous at the base. Stalk slender, about eight inches high. Flowers yellow, two or three only in each head. Vahl.

26. *X. vivipara*. Viviparous Xyris. Kunth n. 2.—“Stalk somewhat compressed; roughish at the top. Leaves linear-sword-shaped; their sheaths fringed. Head globular; at length leafy and viviparous.”—Gathered by Humboldt and Bonpland on the banks of the river Oroonoko, between the mouths of Ventuario and Guaviare, flowering in May. Root fibrous, perennial. Leaves all radical, two-ranked, from two to four inches long, erect, bluntnish, sheathing, smooth, except a little roughness at the back; their sheaths keeled, friated, fringed, roughish also at the back. Stalks about a foot high, smooth, except some roughish points towards the summit; enveloped at the base with a friated, keeled, bluntnish, smooth, rough-backed sheath, an inch and a half long. Head globose, rather abrupt, the size of a pepper-corn. Scales roundish-ovate, bluntnish, brownish, coriaceous, smooth, rather transparent at the margin. After flowering, the head throws out from its centre a leafy crown, which becomes a young plant. Kunth.

We are not told whether this leafy tuft originates in the vegetation of one or two of the seeds; or in the germen being supplanted in the flower by a bud; or, which is the least likely, in a proliforous elongation of the stalk, independent of the parts of fructification altogether.

27. *X. operculata*. Imbricated Xyris. Labill. Nov. Holl. v. 1. 14. t. 10. Brown n. 14. Poiret n. 13. Curt. Mag. t. 1158.—Capsule partly three-celled. Stalk round. Leaves thread-shaped. Head obovate. Scales beardless, imbricated in five rows, with numerous empty ones, gradually smaller, at the base.—Sent from Port Jackson, New South Wales, by Dr. White, in 1792. Mr. Brown also observed it there; and Labillardiere in Van Diemen’s island. Neither the figure of the last-mentioned author, nor that in the Botanical Magazine, by any means represents the remarkable character of the five-ranked scales of the head, and the numerous, gradually diminishing ones, destitute of flowers, at its base; so that, but for Mr. Brown’s authority, we should have supposed our Port Jackson plant to be essentially and widely different. Dr. White’s specimens are without leaves. The stalk is about eighteen inches high, round, or slightly angular, quite smooth. Head obovate, full half an inch long, with five rows of very numerous obovate scales, whose broad convex disk is of a bronze-like hue; the margin brown and narrow, more or less jagged, with a deciduous tooth-like fringe. Flowers large, bright yellow. Stigmas obtuse.

28. *X. lanata*. Woolly Xyris. Br. n. 15.—“Stalk round, smooth. Leaves linear, narrow. Head nearly globose. Scales woolly at the extremity, imbricated in five rows, with several empty ones, gradually smaller at the base.”—Gathered by Mr. Brown, on the southern coast of New Holland.

The above great accession of new species throws much light

light on this hitherto little-known, and ill-described, genus of plants. Could they all be compared together, even in a dried state, we have no doubt that their specific characters, and the principles on which they are founded, would derive considerable improvement; and that *Xyris*, whose generic marks are so well established, would afford a beautiful display of clear and precise specific discrimination. Whether the leaves of any of the species be really toothed, in a living state, we have considerable doubt. Their foliage partakes greatly of the cellular texture, so remarkable in the neighbouring genus *Eriocaulon*; with which also they closely accord in inflorescence, and general habit. Mr. Brown, in his *Prodromus*, has elucidated both these genera, as far as concerns their numerous New Holland species, with infinitely more success than any other botanist; the one genus having previously been scarcely better understood than the other.

XYSMALOBIUM, from *ξύσμα*, a strip, or narrow shred, and *λόβος*, a pod, alluding to the shaggy coat of the seed-vessel, which is very peculiar.—Brown Transf. of the Wernerian Soc. v. 1. 38. *Afcep.* 27. Ait. Hort. Kew. v. 2. 79.—Clas and order, *Pentandria Digynia*. Nat. Ord. *Cantoria*, Linn. *Apocinea*, Juss. *Afclepiadea*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in five deep, lanceolate, acute, permanent segments. *Cor.* of one petal, in five deep, ovate, spreading, rather oblique segments. Crown of the filaments in a single row of ten deep segments; five of them fleshy, roundish, opposite to the anthers, simple at the inner side; five intermediate ones smaller. *Stam.* Filaments scarcely any; anthers five, each tipped with an ovate bluntish membrane; masses of pollen ten, compressed, smooth, pendulous, with rather broad connecting processes. *Pistl.* Germens two, ovate, pointed; styles very short; common stigma pointless. *Peric.* Follicles two, inflated, clothed all over with numerous, long, slender, tapering, hairy, filamentous processes. *Seeds:* numerous, imbricated, crowned with silky down.

Effl. Ch. Masses of pollen ten, smooth, pendulous. Crown simple, in ten deep segments, the intermediate ones minute. Corolla spreading. Follicles shaggy.

A genus of upright shrubs, with opposite, sometimes alternate, leaves. Umbels lateral, either axillary, or between the footstalks. Flowers rather large; the limb of the corolla sometimes bearded. Only two species are at present known, both natives of southern Africa.

1. *X. undulatum*. Waved-leaved *Xysmalobium*. Dryand. in Ait. n. 1. (*Afclepias undulata*; Linn. Sp. Pl. 312. Willd. Sp. Pl. v. 1. 1262. See ASCLEPIAS, n. 1. *Apocynum africanum*, lapathi folio; Comm. Rar. 16. t. 16.)—Leaves undulated, naked. Corolla bearded.—Native of the Cape of Good Hope. Sent to Kew garden, in 1783, by Mr. John Grafer. This is a green-house plant, flowering in July. Mr. Aiton marks it as a shrub; but Commelin says the thick, white, perennial root sends up every year, in the early spring, two or three thick, round, green, leafy stems. All authors speak of the leaves as opposite; but in our Linnæan specimen, gathered at the Cape by Thunberg, they are alternate, sessile, three or four inches long, ovato-lanceolate, gradually tapering to a bluntish point, with a thick mid-rib, and numerous interbranching veins; nearly smooth on both sides; undulated and roughish at the margin. Umbels axillary, stalked, much shorter than the leaves, with hairy stalks, and linear hairy bractæas. Flowers green, their segments densely bearded at the extremity, with white shaggy hairs. Follicles covered with spreading hairy filaments, an inch long. Every part of the plant, when wounded, discharges a copious milky fluid.

2. *X. grandiflorum*. Large-flowered *Xysmalobium*.

(*Afclepias grandiflora*; Linn. Suppl. 170. Thunb. Prodr. 47. Willd. Sp. Pl. v. 1. 1264. See ASCLEPIAS, n. 26.)—Leaves stalked, hairy. Corolla smooth.—Gathered by Thunberg, at the Cape of Good Hope, but as yet a stranger to our gardens, nor does the Linnæan collection contain a specimen. The stem is said to be simple, erect, and hairy. Flowers large, axillary, stalked; but, as far as we can gather, the umbel is not elevated on a common stalk, as in the foregoing. Corolla speckled like *Fritillaria Melegris*, and of a similar colour.

XYSTARCHA, in *Antiquity*, the master or director of the xyftus.

In the Greek gymnasium, the *xyftarcha* was the second officer: the first was the *gymnasiarch*. The *xyftarcha* was his lieutenant, and presided over the two *xyfti*, and all exercises of the athlete therein.

XYSTICI, among the *Ancients*, a designation given to the athlete, because they performed their exercises in the *xyftus*.

XYSTIS, in *Ancient Geography*, a town of Asia Minor, in Caria. Steph. Byz.

XYSTRIS, in *Botany*, Schreb. Gen. 138. Poiret in Lamarck Dict. v. 8. 822, is one of those genera of profferer Schreber's, to which we have adverted under *WHEELERA*, (see that article,) as being unintelligible to all but those who may have access to the learned author's herbarium, or to some record in his manuscripts. The name is Greek, *ξύστis*, a *curry-comb*, or *scraper*.—Clas and order, *Pentandria Monogynia*. Nat. Ord. *Epacridea* of Brown?

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in five deep, lanceolate, acute, spreading, hispid, permanent segments, each contracted at the base. *Cor.* of one petal: tube very short; limb in five deep, ovate, obtuse, veiny, spreading segments. *Stam.* Filaments five, bristle-shaped, erect, spreading at the summit, shorter than the corolla, inserted into the middle of its tube; anthers oblong, erect. *Pistl.* Germen superior, globose, pointed; styles two, capillary, erect, combined in the lower part; stigmas obtuse. *Peric.* Drupa globose, furrowed at the base by short, prostrate hairs, inserted into the middle of the calyx. *Seed.* Nut globose, furrowed, of ten cells; kernels oblong.

Whether this genus be founded on some New Holland specimen of the natural order of *Epacridea*, and whether the rigid or prickly habit of the plant suggested the name, can only be matter of vague conjecture. We acknowledge that the division of the style, and the hispid segments of the calyx, militate greatly against our ideas of the supposed natural order. In total darkness, however, any glimmering of light is welcome, and we will therefore hazard another conjecture, not altogether inconsistent with the former. As Schreber places *Xystris* immediately after the *Jacquinia* of Linnæus, can it possibly have been founded on *Jacquinia ruscifolia*, of whose fructification no botanist, as yet, has given any sufficient account? There seems an association of ideas between the habit of *Rufus*, and the name of *Xystris*; and the globose pointed figure of the fruit, as copied from Plumier in *Dill. Hort. Ellb.* t. 123, answers to part of the above description, though the permanent calyx is drawn obtuse, and not apparently hispid.

XYSTUS, *ξύστος*, formed of *ξύστω*, to polish, or rub, in the *Ancient Architecture*, among the Greeks, was a long spacious portico, either open, or covered over; in which the athlete, and others, practised wrestling and running.

The *xyftus* made a necessary part of a gymnasium. The athlete, who practised in it, were thence called *xyftici*.

XYSTRUS, among the Romans, was an alley, or double row of trees, meeting arbor-wise at top, and forming a shade to walk under.

Y.

Y

Y A D

Y The twenty-third letter in the English alphabet, borrowed, originally, from the Greek *υ*.

It is occasionally both vowel and consonant. As a vowel some authors have judged it unnecessary in our language, because its found is precisely the same with that of the *i*. Accordingly, it is but little used, except in words borrowed from the Greek, to denote their origin, by representing the Greek *υ* ψ λ σ .

The vowel *y*, however, has a place even in some words purely English; and that both in the middle of them, as in *dying, frying*, &c. and at the end, as in *lay*, &c.

Some ascribe the use of the *y*, in pure English and French words, and those that have no *y* in Latin or Greek, to this; that anciently each of those words was written with a double *ii*; which having something awkward in it, the *y* was substituted in their place.

Others say, that those words being anciently written, as well as pronounced, with a double *ii*, as they still are in the Walloon, as *paing, paifan*, &c. to avoid their being mistaken for an *u* with two dots over it, they made the second *i* longer than the first, and so formed the *y* without designing it. Some give a particular reason why words ending in *i* came to be written with *y*; viz. that the copyists found the tail of the *y* very commodious, in adorning the margins and bottoms of pages.

Y was much used by the Saxons; whence it is found for *i* in the old English writers.

When the *y* follows a consonant, and at the end of words, it is a vowel, and has the sound of *i*; and when it precedes a vowel, or diphthong, and at the beginning of words, it is a consonant.

Some have thought that *y* is in all cases a vowel; but Dr. Johnson observes of *y*, as of *w*, that it follows a vowel without any hiatus, as *rosy youth*.

The Romans used the *y* for the vowel *u*, which they had no character for, distinct from the *o* consonant; their way being to pronounce the common *u*, as we do the diphthong *ou*; and the Greek ψ λ σ , as the English and French *u*.

Peter Diaconus observes, that Augustus first took the letters *y* and *z* from the Greeks, which were not used by the Romans before his time; *z* being written for *z*, and *i* for *y*. But Mr. Jackson shews, that the *y* was used before the time of Augustus, though probably (says Atle, Orig. and Progr. of Writing, p. 78.) it was not much older.

In our own and some other modern tongues, authors begin to dispense more and more with the precise orthography, which requires all words that have an upsilon, in the Greek, to be written with a *y*. And with reason; since our Greek *y* has lost the sound it had, in the language from which we borrow it. But it is certainly ridiculous to

use it, as many do, in words which indeed have a Greek origin, but have no *u* in the Greek, as in *eclipse*: yet some affect to do this.

Y is also a numeral letter, signifying 150, or, according to Baronius, 159; as in the verse,—

“*Y* dat centenos et quinquaginta novenos.”

When a dash was added at top, \bar{Y} , it signified 150 thousand.

Pythagoras used the *Y* as a symbol of human life; the foot representing infancy, and the forked top the two paths of vice and virtue, one or the other of which people are to enter upon, after attaining to the age of discretion.

Y, on the French coins, denotes those struck at Bourges.

Y, in *Geography*, a city of China, of the second rank, in Chan-tong; 317 miles S. S. E. of Peking. N. lat. 35° 10'. E. long. 118° 19'.

Y, a city of China, of the second rank, in Pe-tche-li; 55 miles S. W. of Peking. N. lat. 39° 25'. E. long. 115° 14'.

Y, or *Ev*, a river, or broad piece of water, which passes by Amsterdam, exhibiting the appearance of a creek of the sea rather than of a river.

YA, a city of China, of the second rank, in Se-tchuen, on the borders of Thibet; 840 miles S. W. of Peking. N. lat. 30° 9'. E. long. 102° 39'.

YABAQUE, one of the Bahama islands, situated in N. lat. 23° 30'.

YABARGULSKAIA, a town of Russia, in the government of Tobolsk, on the Irutich; 120 miles E. of Tobolsk.

YABAY, a town of Burmah; 50 miles S. W. of Ava.

YABTONOI, a ridge of the Altaian chain in Asiatic Russia, bending in a northerly direction to the vicinity of Ochothk. The name denotes the mountains of Apples.

YACHT. See SHIP, and Plate XIII. *Ship-Building*.

YACHTA, in *Geography*, a fort of Russia, in the government of Irkutsk, on the borders of China; 48 miles S. S. W. of Selenginsk.

YACINTE, St. See St. *Yacinte*.

YACONG TALA, a number of small lakes in Thibet, situated near each other. N. lat. 30° 50'. E. long. 78° 39'.

YADAVA, in *Hindoo Mythology*, a name of the Hindoo Krishna. It is said to indicate his being of the family or tribe of Yadu.

YADI, in *Geography*, a river of Russia, which runs into the Obkskaia gulf, N. lat. 68° 25'. E. long. 72° 38'.—Also, a river of Russia, which runs into the Obkskaia gulf, N. lat. 67° 25'. E. long. 72° 18'.

YADKIN, a river of North Carolina, which rises in the

F Allegany

Alleghany mountains, and after a course of about 100 miles, changes its name to Pedee, in North Carolina; 9 miles S.W. of Salem.

YADRIN, a town of Ruffia, in the government of Kazan; 122 miles W. of Kazan. N. lat. $55^{\circ} 34'$. E. long. $45^{\circ} 44'$.

YAEAGONMEW, a town of Pegu; 58 miles S. of Prone.

YAGA. See JAFFA.

YAGARCHOCA, a lake of South America, in the jurisdiction of St. Miguel de Ibarra. It is famous for having been the sepulchre of the inhabitants of Otobalo: upon this place being taken by Huana Capac, the 12th ynca, he, instead of shewing any clemency to them on account of their magnanimity, being exasperated at the noble resistance which they made against his army, ordered them all to be beheaded, both those who had quietly surrendered, as well as those taken in arms, and their bodies to be thrown into the lake: so that from the waters of the lake being tinged of a bloody colour, it acquired its present name, which signifies "a lake of blood."

YAGATH, in *Mythology*, a deity adored by the ancient Arabian idolaters, under the figure of a lion.

YAGO, St. in *Geography*. See St. Yago.

YAGUACHE, or St. JACINTO DE YAGUACHE, a town of Peru, and principal place of a lieutenantcy, in the province of Guayaquil; 25 miles N.E. of Guayaquil.

YAGUAHS, a town of the island of Cuba; 22 miles S. of Bayamo.

YAGUARIFE, a river of Brazil, which runs into the Atlantic, S. lat. $13^{\circ} 12'$.

YAGUARON, a town of South America, in the province of Paraguay; 10 miles S.E. of Assumption.

YAGUEPURI, a river of Brazil, which runs into the Negro, 50 miles above Fort Rio Negro.

YAH, in *Hindoo Mythology*, a name of Pavana, the Hindoo god or regent of the wind; another of whose names is Vayu. See PAVANA and VAYU.

YAHANGA, in *Geography*, a small island in the sea of Japan. N. lat. $43^{\circ} 8'$. E. long. $131^{\circ} 45'$.

YAHEBIRI, a river of South America, which runs into the Parana, S. lat. $24^{\circ} 20'$.

YAIK, a considerable stream of Asiatic Ruffia, which flows into the Caspian. The name has been recently changed for that of Ural, on account of a daring insurrection of the tribes bordering on the Yaik.

YAITCHNEI, a small island of Ruffia, in the Peninsula of Kamtschatka. N. lat. $60^{\circ} 30'$. E. long. $160^{\circ} 50'$.

YAIWA, a river of Ruffia, which runs into the Kama, 16 miles S. of Solikamsk, in the government of Perm.

YAK, in *Zoology*, the *bos grunniens* of the Linnæan system, or ox with cylindric horns curving outwards, very long pendant hair, and extremely villous horse-like tail, the grunting ox of Pennant, and yak of Tartary, has been lately particularly described by Turner, in his "Embassy to Tibet." He calls it the bushy-tailed bull of Tibet; and in Hindoostan it is denominated foora go. It is about the height of an English bull, which it resembles in the general figure of the body, head, and legs. He could discover no difference between them, except that the yak is wholly covered with a thick coat of long hair. The head is rather short; the horns tapering from the root upwards, and terminating in sharp points; arched inwards, and bending towards each other, but a little turned backwards near the extremities; the ears small; the forehead prominent; the eyes full and large; the nose small and convex; the nostrils

small; the neck short and curved; the withers are high and arched; the rump low; over the shoulders rises a thick muscle, like the protuberance peculiar to the cattle of Hindoostan, covered with a profusion of soft hair; the tail composed of a prodigious quantity of long, flowing, glossy hair; the shoulders, rump, and upper part of the body, clothed with a sort of thick soft wool, the inferior parts having straight pendant hair that descends below the knee, and sometimes trailing on the ground; from the chest, between the legs, issues a large pointed tuft of straight hair, somewhat longer than the rest; the legs very short. In all other respects, this animal resembles the ordinary bull. These cattle appear of a large bulk; they have a downcast heavy look, and are, as they appear to be, fullen and suspicious, and very impatient at the near approach of strangers. Their lowing is not loud, but a kind of scarcely audible grunting noise. They are pastured in the coldest parts of Tibet, on the short herbage peculiar to the tops of mountains and bleak plains. Their favourite haunt is the chain of mountains that is situated between the latitudes 27° and 28° , which divides Tibet from Bootan, and whose summits are commonly covered with snow. They are a valuable property to the tribes of itinerant Tartars, called Duckba, who live in tents, and tend them from place to place; they at the same time afford their herdsmen an easy mode of conveyance, a good covering, and wholesome subsistence. They are never employed in agriculture, but are very useful as beasts of burthen; for they are strong, sure-footed, and carry a great weight. Tents and ropes are manufactured of their hair, and caps and jackets are made of their skins. Their tails are much esteemed; and under the denomination of *chowries*, they are universally used for driving away winged insects, flies, and mosquitoes, and are employed as ornamental furniture upon horses and elephants. They supply an abundant quantity of rich milk and excellent butter, which may be kept in skins or bladders through the year, and to the utmost verge of Tartary furnishes a very material article of commercial produce. The orientals highly value a large kind of bezoar that is sometimes found in this animal's stomach. The yak is said to vary in colour, as well as in the length and form of the horns. Those with white tails are most esteemed; and sometimes their horns are as white as ivory.

In India no man of fashion ever goes out or fits in form at home without two "chowabadars," or brushers, attending him, each furnished with one of these tails, mounted on silver or ivory handles, to brush away the flies. The Chinese dye them of a beautiful red, and wear them as tufts to their summer bonnets.

Elian, according to Pennant, is the only ancient writer who takes notice of this singular species.

YAK, in *Geography*, a name given by the Ostiaks to the *Oby*; which see.

YAKE DSAKE, a lake of Thibet, about 12 leagues in circumference. N. lat. $34^{\circ} 40'$. E. long. $90^{\circ} 24'$.

YAKSAI. See AKSHAI.

YAKSHA, in *Hindoo Mythology*, a race of malignant beings of hideous form, into whom the souls of bad men are said to migrate; particularly the souls of such as in this life are addicted to fordid and base passions, or absorbed too much in worldly prosperity. In the plural, they are termed Yakshas; and are assigned as slaves or servants to Kuvera, the Pluto of the Hindoo Pantheon. Another race of beings, of a like description, is called *Rakhsas*. (See that article.) Rakshini and Yakshini are the feminines of these races of demons. These names, and some note of their characters

characters and attributes, occur in the articles KURERA, RAVENA, and SITANTA.

YAKSHNI-DEVI, a name and an inferior manifestation of the Hindoo goddess Parvati. It means goddess of malignant beings; one race of whom are in the masculine termed *Takhsa*, which article, and others thence referred to, the reader desirous of information concerning them may consult.

YAKSIMVAR, in *Geography*, a town of Russia, in the government of Viborg, on the north-west coast of lake Ladoga; 8 miles S. of Serdopol.

YAKUTSK, a town of Russia, in the government of Irkutsk, on the Lena, which is here about two leagues in width; but it is greatly impeded with ice, and navigable only by a few small boats, chiefly employed in supplying the town with provisions. This town is the capital of a province, to which it gives name: it contains between 500 and 600 houses, mostly of wood, with some stone churches, and is defended by a wooden fort. The best fables are found near this town and Nerhinsk; 960 miles N.E. of Irkutsk. N. lat. $62^{\circ} 5'$. E. long. $129^{\circ} 14'$.

YAKUTSK, *the Province*. The Yakutes, or, as they denominate themselves, *Sochos*, or natives of this province, are robust, and in general large; they resemble the Tartars in the cast of their features, and there is said also to be a great familiarity in the idioms of these two people. Their ancient homestead extended from the Sayane mountains as far as the Angara and the Lena. Persecuted by the Burats and Mongoles, they removed down the Lena to their present rude and inclement districts, where they are found in the government of Irkutsk on both sides of that river quite to the Frozen ocean. In the year 1620 they submitted to the Russian conquerors, and at the middle of the last century they numbered upwards of 40,000 souls; but since that time they are considerably increased. Their dress is simple, and nearly the same all the year round; the only difference is, that in winter it is made of skins; over their chemise they commonly wear a large striped waistcoat with sleeves; their breeches do not extend below the middle of the thigh, but their long boots, called *Jarri*, reach above the knee. In hot weather they wear nothing but the breeches. Polygamy forms a part of the political code of this people; obliged to make frequent journeys, a Yakute has a wife in every place where he stops, but he never assembles them together. Notwithstanding this licence, they are jealous to excess, and the sworn enemies of any one who shall dare to violate the rights of hospitality. When summer commences, they leave their winter habitations, and with their families and a small number of horses, make their harvests of fodder for consumption during the frost season. They repair to a considerable distance from their yurt, and to the most fertile cantons. In their absence, the horses are left to the care of the servants, and the neighbouring pastures serve for the maintenance of all their herds. Chamans, or forcerers, are regarded as interpreters of the gods; they grant their mediation to the stupid Yakute, who implores it with trembling, but always pays for it. In the idolatry of the Yakutes, we find all the absurdities and superstitious practices of the ancient Kamtschadales, Koriaks, Tchutchis, and other inhabitants of these countries. The funerals are attended with a kind of pomp more or less magnificent, in proportion to the rank and wealth of the deceased. If a prince, he is arrayed in his finest habits, and most splendid arms. The body, placed in a coffin, is carried by the family to the tomb; deep groans announce the solemn procession; his favourite horse, and another the best in

his stud, both richly caparisoned, and led by a valet, or near relation, walk by the side of the corpse. When arrived at the burying-place, they are tied to two stakes, fixed near the grave, and while the master is interred, their throats are cut over the corpse. This bloody libation is the homage paid to his attachment to these animals, who are supposed to follow him into the other world, where it is imagined that he will again be able to enjoy them. They are then flayed; the head and hide, in one entire piece, are fixed horizontally upon the branches of trees at a small distance from the grave; and such is the memorial that is erected. A fire is then kindled, and the last proof of friendship for the deceased consists in roasting and eating upon the spot these favoured animals: the feast being concluded the company disperses. The same ceremonial is observed for a woman, except that instead of a horse, they sacrifice her favourite cow. Their houses, like the yurts of the wandering Koriaks, are circular, spacious, and constructed with poles, fewer in number, but ranged in the same manner, and kept asunder by a sort of hoops at the top, the whole covered with the bark of the birch-tree, formed into pieces eighteen inches wide, placed in a downward direction. These pieces are edged with a kind of ribband, made of bark, and shaped into festoons, and the inside of the yurt is ornamented in the same manner. The taste of the ornaments is governed by the caprice of the proprietor, and there is in them a sort of wildness that is sufficiently amusing. The same decoration is annexed to the chairs and beds of the heads of families. The domestics lie upon the ground on mats or skins, and the fire is lighted in the middle of the house. See YUHAGHRS.

YALE, a town of the island of Ceylon; 56 miles S.S.E. of Candi. N. lat. $6^{\circ} 52'$. E. long. $81^{\circ} 20'$.—Also, a river of Ceylon, which runs into the sea, on the S.E. side of the island, N. lat. $6^{\circ} 23'$. E. long. $81^{\circ} 41'$.

YALE College. See COLLEGE.

YALEPUL, in *Geography*, a town of Ceylon, at the mouth of the Yale; 30 miles S. of Yale.—Also, a town of the island of Ceylon, near the E. coast; 96 miles S.E. of Candi.

YALLAH'S BAY, a bay of the island of Jamaica, on the S. coast, situated to the E. of Yallah's Point.

YALLAH'S Point, a cape on the S. coast of Jamaica; 12 miles S.E. of Kingston. N. lat. $17^{\circ} 53'$. W. long. $76^{\circ} 21'$.

YALLAH'S River, a river of Jamaica, which runs into the sea, a little to the east of Yallah's Point.

YALMAL, a cape on the E. coast of Russia, in the Karakoe sea. N. lat. 72° . E. long. $68^{\circ} 24'$.

YALME, a river of Devonshire, which runs into the English Channel, 7 miles S.E. of Plymouth.

YALOFFS, YALOFFS, *Jalofi*, or *Jalloffi*, an active, powerful, and warlike race of negroes, and esteemed the most handsome of those people, who inhabit a great part of that tract of Africa which lies between the Mandingo states, on the river Gambia to the S., and the Senegal to the N. and E. See JALOFFS.

The Yaloffs differ from the Mandingoes, (see MANDING,) not only in language, but likewise in complexion and features. Their noses are not so much depressed, nor the lips so protuberant, as among the generality of Africans; and although their skin is of the deepest black, they are considered by the white traders as the most highly negroes in this part of the continent. They are divided into several independent states or kingdoms; which are frequently at war either with their neighbours, or with one another. In

their manners, superstitious, and government, however, they have a greater resemblance to the Mandingoes than to any other nation; but excel them in the manufacture of cotton cloth, spinning the wool to a finer thread, weaving it in a broader loom, and dyeing it of a better colour. Their language is said to be copious and significant, and is often learnt by Europeans trading to Senegal. Their numerals are as follow :

One	-	-	Ween
Two	-	-	Yar
Three	-	-	Yat
Four	-	-	Yanet
Five	-	-	Judom
Six	-	-	Judom Ween
Seven	-	-	Judom Yar
Eight	-	-	Judom Yat
Nine	-	-	Judom Yanet
Ten	-	-	Fook
Eleven	-	-	Fookang Ween, &c.

Park's Travels, vol. i.

In connection with this brief account of the Yaloffs, we cannot forbear mentioning an anecdote that redounds very much to the honour of Damel, their king. On occasion of a war between Damel and Abdulkader, king of Foota Torra, a country to the W. of Bondon, the latter inflamed with zeal for propagating his religion, sent an ambassador to Damel, accompanied by two of the principal Bahfreens, who carried each a knife, fixed on the top of a long pole. When they obtained admision into the presence of Damel, they announced the object of their embassy in the following singular manner :—" With this knife," said the ambassador, " Abdulkader will confend to shave the head of Damel, if Damel will embrace the Mahometan faith; and with this other knife, Abdulkader will cut the throat of Damel, if Damel refuses to embrace it—take your choice." Damel coolly replied, that he had no choice to make; he neither chose to have his head shaved, nor his throat cut: and with this answer the ambassador was civilly dismissed.

Abdulkader with a powerful army invaded Damel's country. The inhabitants of the towns and villages filled up their wells, destroyed their provisions, carried off their effects, and abandoned their dwellings as he approached. Thus he was led on from place to place, until he had advanced three days' journey into the country of the Yaloffs. Several of his men had died with fatigue and hunger by the way. This led him to direct his march to a watering-place in the woods, where his men, having allayed their thirst, lay down, overcome with fatigue, to sleep among the bushes. In this situation, they were attacked by Damel before day-break, and completely routed. Many were killed, and a greater number taken prisoners. Among the latter was Abdulkader himself, who was led, as a miserable captive, into the presence of Damel. The behaviour of Damel on this occasion is celebrated, in terms and sounds of the highest approbation, by the singing men. When his royal prisoner was brought before him in irons, and thrown upon the ground, the magnanimous Damel, instead of setting his foot upon his neck, and stabbing him with his spear, according to the custom in such cases, addressed him in the following manner :—" Abdulkader, answer me this question. If the chance of war had placed me in your situation, and you in mine, how would you have treated me?" " I would have thrust my spear into your heart," returned Abdulkader with great firmness; " and I know that a similar fate awaits me." " Not so," said Damel; " my spear is indeed

red with the blood of your subjects killed in battle, and I could now give it a deeper stain by dipping it in your own; but this would not build up my towns, nor bring to life the thousands who fell in the woods. I will not therefore kill you in cold blood; but I will retain you as my slave, until I perceive that your presence in your own kingdom will be no longer dangerous to your neighbours; and then I will consider of the proper way of disposing of you." Abdulkader was accordingly retained, and worked as a slave for three months; at the end of which period, Damel listened to the solicitations of the inhabitants of Foota Torra, and restored to them their king.

YALOVA, a town of Natolia, on the sea of Marmora, once the residence of Dioclesian; 30 miles N. of Brusa.

YALUTOROVSK, a town of Russia, in the government of Tobolsk, on the river Tobol; 108 miles S.W. of Tobolsk. N. lat. 56° 8'. E. long. 66° 32'.

YAM, in *Botany*, a large fleshy root, eatable when boiled or roasted, of which there are several species, all natives of tropical climates, and highly useful to voyagers, as they will, like potatoes, keep for a considerable time without spoiling. See DIOSCOREA.

YAM, in *Geography*. See JAMEZ.

YAMA, in *Hindoo Mythology*, is the god of the infernal regions, corresponding with the Pluto of western heathens. Yama is a very important deity: his name is of perpetual recurrence in the sacrificial ceremonies of the Hindoos; oblations and invocations to him forming a portion of many of those ceremonies. The Hindoos, as is explained under our article MARUT, have assigned regents or guardian deities to each of the cardinal and intermediate points of the world. Yama is regent of the fourth, or lower world, in which the Hindoos place the infernal regions; this corresponding with the Grecian Pluto or Minos. Under our article MENU, the great law-giver of that name is supposed to have been the same person as the Minos of antiquity. Yama has many names; and in his character and functions is found related to many important personages of sacred and profane history. Among his names are, *Dharma-rajah*, or king of justice; *Pitripati*, lord of the Pitris, or patriarchs (see PITRIS); and *Mritu*, meaning death; a name also of *Kala*, or *Siva*. (See those articles.) *Susan-yama*, and *Vaivatsvata-yama*, are others of his names, derived, it is said, the first from a term denoting comeliness or beauty, the other from his solar origin; Yama being of the race of the sun, of which some explanation will be found under our article SURYAVANSA. He is also named *Sradha-deva*, or lord of the obsequies, in honour of deceased ancestors, of which a copious account is given under SRADHA. As well as the Seventh Menu, Yama bears likewise the name of *Satyavrata*. He is also named *Adbumbara*; this name is said to be derived from a species of wood, by the attrition of which fire is produced, wherewith to light the pile on which funeral obsequies are performed to Yama. Every thing connected with the important element of fire is peculiarly mythical with the Hindoos. Touching the sacrificial and other fires, the reader will find many particulars under our articles PAVAKA, SAGNIKA, SAMI, and others thence referred to. *Anbeka* is another name of Yama; it means *death*, or the *destroyer*: thus the compound *Kal-anbeka-yama* is Yama, the destroyer of Kal or Time, a personification of great boldness and extent. *Kal* is also a name of Yama. (See KAL.) Yama has other compound names, meaning the slayer of all beings, king of deities, reducer of all things to ashes, the dark-blue deity, of wolf-

like belly, the variegated being, the wonderful inflictor of pains, &c.

His abode is in the infernal city of Yamapur, whither the Hindoos believe that a departed soul immediately repairs; and receiving a just sentence, ascends to Swerga, the first heaven, or descends to Nareka, the fnaky hell; or is returned to earth, according to its merits or demerits, where it assumes the form of some animal, unless its offences had been such as deserved condemnation to a vegetable or even to a mineral prison. This extensive theory of transmigration is of a very poetical tendency, affording great scope for the imagination, which the mystical and enthusiastic turn of Hindoo metaphysicians or theologians has amply indulged in.

Mr. Wilford believes Yama to be the same with Serapis; deriving the latter from a Sanskrit term, implying thirst of blood. In the Puranas, Yama is described as attended by two dogs, named Serbura and Syama; the first name signifies *varied*, and it has other appellations meaning *stained* or *spotted*. When we add that it was also called *Tri-siras*, or the three-headed, little doubt can be entertained of its being the same with the Cerberus of the Greeks. *Syama* means *black*. See SERBURA, SYAMA, and TRI-SIRAS.

As Dherma Raja, or the king of justice, Yama is described in the Puranas as having two countenances. "One, called his divine countenance, is mild and benevolent; and thofe only see it who abound in virtue. In this form, he is called an emanation of Vishnu. He is attended by a servant named Karmala, who conducts the righteous on self-moving cars into the presence of their judge. His other countenance or form is more especially named Yama. He is then depicted with large teeth and a monstrous body, and is thus seen only by the wicked. His attendant is named Kāshmalā, who drags the wicked with ropes round their necks over rugged paths; and at the command of Yama some are beaten, some cut to pieces, some devoured by monsters, and thrown headlong into hell. He is unmerciful, hard is his heart, and every one trembles at his sight."

Yama is the name of a celebrated legislator, whose enactments are still venerated by the Hindoos. For his profound knowledge and justice, he is said to have been made the judge of departed spirits.

In the seeming contradictions of mythologists, Yama is found to be identified, or nearly so, with both *Siva* and *Vishnu*, (see those articles,) as well as with Menu, Kala, and others. This may be reconciled, as in the mythology of Greece, by recollecting that almost all the deities melt into one. Proserpine or Hecate is given to Pluto as a help-mate, being but another form of Diana. Thus Yama has a form of Parvati assigned him, under the name and character of Pataladevi, or goddess of the infernal regions. (See PATALADEVI.) In heaven Diana is Luna, and Parvati is Swardévi, or queen of heaven. On earth they are distinguished by the names of Diana and Bhudevi, the latter meaning goddess of the earth. These similarities or coincidences could be carried to a great extent.

Some of the ceremonies still in use as propitiating Yama, or his consort *Sakti*, (which see,) have been found by Sir W. Jones and others, as strikingly resembling those of the Eleusinean goddesses; and there can be no doubt but the investigation of the mythological fables of the Hindoos has thrown great light, and may throw still greater, on many obscure and unintelligible passages of our ancient poets of Europe.

We do not find any direct representation of Yama, or

any minute description of his person and attributes, in the mythological works before the public; nor many particulars of his family. We have already noticed him as the offspring of the sun; this he shares in common with several other of the heroic personages of the Hindoos. Yama is indeed one of the many names of Surya, or the sun. The river Yamuna, or Jumna, or rather perhaps the damsel who was poetically metamorphosed into that interesting stream, is fabled as the twin sister of Yama. She is poetically called the "blue daughter of the sun." Days are especially set apart for certain ceremonies to their honour. On one, Yamuna is said to have entertained her brother; and the remembrance of it is preserved in an existing usage of Hindoo young ladies feasting and making their brothers presents on its anniversary. In the Rig-veda (see VEDA), a dialogue is given, in which Yama endeavours to seduce his beautiful sister; but his base offers are rejected by her with virtuous expostulation. In some accounts, a divinity named Swadha is described as the goddess of funeral obsequies; and as such we should expect to find her closely allied to Yama, but know little of the relationship. We have noticed her under the article SWADHA. Several other of our articles contain some particulars of Yama. See KASYA, KRITANTA, SRADHADEVA, TAPAS, and VAIVASWAT.

YAMAMAK, in *Geography*. See JAMAMA.

YAMANACHALINSKOI, a town of Russia, in the government of Caucasus, on the Ural; 20 miles N. of Guriev.

YAMASCA, a river of Canada, which runs into the St. Lawrence, N. lat. 46°. W. long. 72° 45'.

YAMASCO, a town of Canada, at the conflux of the Yamasca with the St. Lawrence.

YAMBLAK, one of the *Aleutian islands*; which see.

YAMBO. See JAMBO.

YAMBURG, a town of Russia, in the government of Peterburg, on the Luga. The cloth manufactory at this place was instituted by Catharine II., presently after her accession to the throne: it contains 36 looms, and employs 600 persons. The cloths are sold at St. Peterburg at a low price; 20 miles E. of Narva. N. lat. 59° 15'. E. long. 28° 40'.

YAMEOS, a town of South America, in the audience of Quito, on the river Amazons; 36 miles W.S.W. of St. Joachim de Omaguai.

YAMIMKA, a river of Russia, which rises in the government of Tobolsk, and runs into the Irtysh, 14 miles S.S.W. of Kozlovo.

YAMINA, a town of Africa, in the kingdom of Bambarra, near the Niger. This town, according to Mr. Park, was large, covering the same extent of ground as Sanfanding; but having been invaded and plundered a few years since by the king of Kaarta, it was, when he was there, half in ruins. N. lat. 13° 46'. W. long. 3° 50'.

YAMON BAY, a bay on the north coast of the island of Luçon. N. lat. 14° 21'. E. long. 122° 37'.

YAMSCHEVSKAIA, a fort of Russia, in the government of Kolivan, on the Irtysh. N. lat. 51° 55'. E. long. 77° 50'.

YAMSKAIA, a gulf of Russia, in the Penzinskoi sea, between Cape Piliatchin and the continent. N. lat. 60° 20'. E. long. 154° 14'.

YAMSKOI, a town of Russia, near the gulf of Yamskaia; 2500 miles E. of Tobolsk. N. lat. 60° 12'. E. long. 153° 34'.

YAMUMINTI, in *Hindoo Mythology*, the name of one

of the wives of the amorous Hindoo deity Krishna. Her name seldom occurs.

YAMUNA, in *Geography*, a river of India, which takes its rise, as is supposed, in the great range of mountains called Himalaya. Its source has not been accurately explored, but it probably is not more remote than that of the Ganges, which rises in the southern part of that range. The Yamuna flows through the province of Srinagara, or Serinagur, in a southerly course, nearly parallel with the Ganges, approaching its sister stream to within forty miles, at the village of Garudavara (Gurudwar), in N. lat. $30^{\circ} 22'$; it is then of nearly equal width. The Yamuna enters Hindoostan Proper, in the province of Delhi, varying its distance from eighty to fifty miles from the Ganges. The country between them is called Dooab, a word meaning two waters, or watered by two rivers. It is a very fertile district. The rivers approximate and join at Allahabad, an important fortress and military station under the Bengal government, when the Yamuna, little inferior in magnitude, has its name and waters absorbed in the more celebrated stream. Its length, of course under its own name, is estimated at about nine hundred miles.

For many miles of its course, the Yamuna, or Jumna, as it is more properly called, was considered a boundary to the British territories, dividing them from the possessions of the Mahrattas. But from its shallowness, being fordable in many places in the dry season, it was not an important military barrier; and for the same reason is of less consequence for the operations of commerce.

The confluence of any two rivers is viewed with holy respect by Hindoos,—of these two grand streams more particularly. To heighten the mysticism, (any *ternary* connection being still more deeply venerated,) it is feigned that a third river, the Sarafwati, joins the other two by a subterranean communication at Allahabad. Frequent allusion is made to this occult union by mythological poets, who teach that these three rivers are terrene manifestations of the three great goddesses, Parvati, Lakshmi, and Sarafwati; the Sakti, as they are called, or active energies of their respective lords, Siva, Vishnu, and Brahma, who compose the Hindoo triad of divinity. Of these personages sufficient will be found in the articles given under their several names in this work. The fable of the “three plaited locks,” as this supposed union of these rivers is poetically called, often occurs in the writings of the Hindoos: it is noticed in our articles **JUNCTIONS**, **TRIVENI**, and **ZENNAR**. Under **SUCIDE**, an account is given of the supposed proneness of the Hindoos to this crime. At the confluence now under our notice, it not only loses its fin, but assumes a meritorious form. Of this, see more under **SUTTEE**.

The river goddess Yamuna is made by mythologists to be the same with Lakshmi, consort of Vishnu, and twin sister of Yama, the judge of departed spirits, and ruler of the infernal regions. Of these personages sufficient occurs under their respective names.

YAMUTHA, one of the Aleutian islands. N. lat. $53^{\circ} 40'$. E. long. $180^{\circ} 29'$.

YAMYA KONDA, a town of Africa, in the kingdom of Yani.

YAMYAMA KUNDA, a town of Africa, in the kingdom of Tomani.

YANA, a river of Russia, which rises in a lake, situated in lat. $63^{\circ} 40'$, long. $131^{\circ} 14'$, and running due north, being supplied by many small streams, empties itself in the Frozen sea, N. lat. $71^{\circ} 25'$. E. long. $131^{\circ} 16'$. At its discharge

it forms five considerable rivers, which issue in a capacious bay.

YANAM, a town of Hindoostan, in the circar of Rajamundry; 28 miles S.E. of Rajamundry.

YANATONG, a town of Burmah; 40 miles S. of Mellone.

YANAUCA, a small island at the mouth of the river of the Amazons; 10 miles N. of Caviana.

YANDABOO, a town of Birman, on the Irawaddy, remarkable for its manufacture of earthenware; 70 miles W.S.W. of Ava.

YANDINSKOI, a town of Russia, in the government of Irkutsk, on the Angara; 160 miles N.N.W. of Irkutsk. N. lat. $54^{\circ} 30'$. E. long. $103^{\circ} 20'$.

YANFONG, a town of Corea; 40 miles E.S.E. of Ou-tchuen.

YANG, a town of Corea; 13 miles E. of King-ki-tao.

YANGBONRAW, a town of Pegu; 60 miles S. of Lundfey.

YANG-CONG, a river of China, which runs into the Kincha river, near Lo-choui-tong.

YANG-HO, a river of China, which joins the San-cam-ho, N. lat. $40^{\circ} 23'$. E. long. $112^{\circ} 49'$.

YANG-KIN, a town of the kingdom of Corea; 15 miles S.E. of King-ki-tao.

YANG-LI, a city of China, of the second rank; 1157 miles S.S.W. of Peking. N. lat. $22^{\circ} 54'$. E. long. $106^{\circ} 35'$.

YANG-TCHEN, a town of Corea, in Tchufin; 150 miles S.S.W. of King-ki-tao. N. lat. $35^{\circ} 19'$. E. long. $125^{\circ} 14'$.

YANG-TCHEOU, a city of China, of the first rank, in Kiang-nan, situated on the bank of the royal canal, which extends from the Ta-kiang northwards to the river Hoang-ho, or the Yellow river: it carries on a great trade in all manner of Chinese works, and is rendered extremely populous, chiefly by the sale and distribution of the salt that is made on the sea-coasts of this jurisdiction and parts adjoining, and which is afterwards carried along small canals made for this purpose, which end in communication with the great canal; 485 miles S.S.E. of Peking. N. lat. $32^{\circ} 26'$. E. long. $118^{\circ} 54'$.

YANG-TCHUEN, a town of Corea; 35 miles W.S.W. of King-ki-tao.

YANG-TE', a town of Corea; 84 miles E. of Hantcheou.

YANG-TSE-KIANG, a river of Asia, which rises in the mountains of Thibet, and after crossing the empire of China, from east to west, empties itself into the sea, 120 miles E. from Nan-king. This river changes its name almost in every province through which it passes. See **KINCHA**.

The Yang-tse-kiang may be considered as equalling, if not exceeding in size, the **YELLOW River** (which see). The sources of both these rivers are in the same range of mountains, and they approach one another in one part within a few miles. The Yang-tse-kiang, according to Mr. Barrow's statement, consists of two distinct branches, which separating from each other about eighty miles, flow in a parallel direction to the southward for the space of 70 miles, and then unite between the 26th and 27th degrees of N. latitude, just at the boundaries of the two provinces of Yunnan and Szechuen. Then striking off to the N.E. directly through the latter of these provinces, collecting the waters of the numerous rivers that descend towards it from that and another province called Quee-choo, it continues in this direction about 600 miles, and then enters the province of Hoo-quang, in the

31st degree of N. latitude. Through this province it takes a serpentine course, and receives the waters of several lakes, with which this part of the country abounds. Leaving Hoo-quang, it passes between the province of Ho-nan and Kiang-fee, and with a little inclination from the E. towards the N., its copious stream glides smoothly through the province of Kiang-nan, and is diftemoged into the sea, which bounds China to the E. in the 32d degree of N. latitude. The distance from thence to Hoo-quang is about 800 miles, which makes the whole length of the river about 2200 miles. The current, where the yachts of lord Macartney's embassy passed it, did not exceed in the strongest part two miles; but it was much deeper than the Yellow river. There these two great Chinese rivers, taking their sources in the same mountains, passing almost close to each other in a particular spot, separating afterwards from each other to the distance of 15 degrees of latitude, finally discharge themselves into the same sea, within two degrees of each other; comprehending within their grasp a tract of land of above 1000 miles in length, which they contribute greatly to fertilize and enrich, though by extraordinary accidents occasioning unufual torrents, they may do injury in particular instances. This tract includes the principal portion of the Chinese empire in ancient times; and lies in that part of the temperate zone, which in Europe, as well as in Asia, has been the scene where the most celebrated characters have existed, and the most brilliant actions been performed, which history has transmitted to posterity. When the gentlemen of the embassy had crossed the Yang-tse-kiang, they found that, instead of a flat country, lakes, and swamps, the ground rose gradually from the margin of the river, enriched with various kinds and tints of culture, intersperfed with trees, temples, and pagodas. In the river were islands skirted with shrubbery, and rocks rising abruptly from the surface of the water. The waves rolled like those at sea, and porpoises are said to be sometimes seen leaping amongst them: several junks were lying at anchor. In the middle of the river is the island called "Chin-fan," (which see.) The ground to the southward of the river gradually rose to such a height, that it was found necessary to cut down the earth in some parts to the depth of near 80 feet, in order to find a level for the passage of the canal. The land in this neighbourhood is chiefly cultivated with that particular species or variety of the cotton-plant that produces the cloth usually called Nankeens in Europe. The down enveloping the seed, or cotton-wool, is whole in the common plant; but in that growing in the province of Kiang-nan, of which the city of Nan-kin is the capital, the down is of the same yellow tinge which it preserves when spun and woven into cloth. The colour, as well as the superior quality of this substance in Kiang-nan, was supposed to be owing to the particular nature of the soil; and it is asserted, that the seeds of the Nankeen cotton degenerate in both particulars when transplanted to another province, however little different in its climate. Lord Macartney's Embassy, vol. ii.

YANG-TSI, a town of Corea; 30 miles S. of King-ki-tao.

YANI, a kingdom of Africa, situated to the east of Burfali, and divided into Upper and Lower, on the north side of the river Gambia. See PISANIA.

YANIMAREW, a town of Africa, in the Lower Yani.

YANIMAZCU, a town of Africa, in the kingdom of Yani. N. lat. 13° 40'. W. long. 14° 1'.

YANKEON, a mountain of Thibet; 30 miles N. of Zuenga.

YANKJA, a town of Assyria, near the Tigris, and

not far from Bagdad. This place and also Doueffla are small straggling towns, every house being surrounded by a separate mud-wall.

YANTAC, a town of Thibet; 28 miles S.W. of Harachar.

YAN-TCHIN, or VAN-TCHIN, a city of China, of the second rank, in Quang-fi; 1177 miles S.S.W. of Peking. N. lat. 23° 1'. E. long. 106° 51'.

YAN-TINCOU, a town of Thibet; 75 miles E.N.E. of Pa.

YANTRA, a word denoting a mystical figure among the Hindoos; also a mathematical instrument used in any science or art of an occult nature. An instrument used in astronomical observations, called Golayantra, or the spheric yantra, is described in the ninth volume of the Asiatic Researches, art. 6, as similar to our armillary sphere. The article now referred to by Mr. Colebrooke, president of the Asiatic Society of Calcutta, is very curious and important. The Hindoos, being so prone to mysticism, can fancy various wishes in occult figures and practices. Figures similar to the magic squares, abracadabra, &c. of western wizards, are still used and venerated by the knaves and fools of Asia; these are generally called yantra: as are peculiar figures or hieroglyphics, appropriated to certain Hindoo deities, whose followers or sectaries mark their foreheads therewith, and deem them of a sanctifying tendency. The nature of these various yantras, with suitable instructions and warnings as to their formation, uses, and purposes, are taught in a Sanskrit book, entitled "Agamastra, or Occult Science." It may be noticed in passing, that the word Agama, meaning in the Sanskrit tongue hidden, mysterious, secret, &c. seems to have had in various languages and regions a similar meaning, as to which it may suffice to refer to our articles OGHAM, O'M, and SHASTAR.

Combined with and related to the yantra, are certain imprecations, incantations, charms, philtres, &c. called Mantra and Tantra, which occur frequently in Hindoo writings, and of which some notice is taken in this work under those words.

YAO, in Geography, a city of China, of the second rank, in Chen-fi; 485 miles S.W. of Peking. N. lat. 35° 54'. E. long. 108° 31'.

YAO-NGAN, or YAO-GAN, a city of China, of the first rank, in Yun-nan. The territory of this city is considerable, although it contains but two cities, one of the second order, and the other of the third. It is intermixed with mountains, which are covered with fine forests and fruitful valleys, and produces abundance of musk: near the city there is a well of salt water, from which they make very white salt; 1175 miles S.W. of Peking. N. lat. 25° 33'. E. long. 101°.

YAO-TCHEOU, a town of Chinese Tartary; 380 miles E.N.E. of Peking. N. lat. 40° 43'. E. long. 122° 14'.

YAO-TCHEOU, or YAO-CHOO-FOO, a city of China, of the first rank, in Kiang-fi, situated on the S.E. bank of the lake Po-yang. It has seven towns of the third rank in its jurisdiction. In this town is a large manufacture of porcelain, from whence, as well as from King-te-ching, it is sent to Nem-chang-foo; 670 miles S. of Peking. N. lat. 29°. E. long. 116° 14'.

YAP, among the Hindoos, is a silent meditation on the names, attributes, and powers of the Deity. Great merit is ascribed to this species of devotion, which is otherwise, though we apprehend less correctly, spelled *yap*; under which article we find we have sufficiently described it, although reference has occasionally been made to this article;

title; which is therefore thus given, chiefly to point to the more lengthened description.

YAP Island, in *Geography*, one of the group called *Carolines*; which see. In this island, a kind of crocodile is the object of their worship. Here are also a number of magicians, who impose upon the credulity of the inhabitants, by leading them to believe, that they have communication with the evil spirit; and by this imposition, they commit with impunity all sorts of crimes. They procure maladies and even death to those whom it is their interest to destroy.

YAPANDAIN, a town of the empire of Birmah, on the Irawaddy; 40 miles W. of Ava.

YAPIZLAGA, or **LLANOS DE MANSO**, a province of South America, in the vice-royalty of Buenos Ayres, of great extent, situated to the south of the Vermejo river. This country was formerly called Llanos de Manfo, or the Plains of Manfo, from a captain of that name, who in 1556 undertook to build a town: but when he thought himself in perfect security, he, with all his attendants, was murdered by the Indians; of whom there are several nations. The country is but little known.

YAPOC, a river of Surinam, which runs into the Atlantic, near Cape Orange.

YAPON, in *Botany*, a species of *ilex*. See **HOLLY**.

YARACUI, in *Geography*, a river of Venezuela, which runs into the Spanish Maine, N. lat. 10° 28'. W. long. 68° 40'.

YARANSK, a town of Russia, in the government of Viatka; 72 miles S.W. of Viatka. N. lat. 55° 36'. E. long. 48° 34'.

YARAY, a town of Africa, in the kingdom of Kayor; 80 miles S.E. of Amboul.

YARBA, a town of Africa, and capital of a country, called Yarra; 430 miles S.W. of Tombuctoo.

YARD, *Virga*, a long measure, used in England and Spain; chiefly to measure cloth, fluffs, &c.

The English yard contains three feet. It was first settled by Henry I. from the length of his own arm. See **MEASURE**.

The English yard is just seven-ninths of the Paris ell; so that nine yards make seven ells. To reduce ells, therefore, into yards, say, If seven ells give nine yards, how many yards will the given number of ells give?

Yards are converted into ells Flemish, by adding a third part; into ells English, by subtracting a fifth part; or multiplying by 8, and casting off the right-hand figure. Ells English are converted into yards, by adding a fourth. To turn ells Flemish into yards, subtract one quarter.

The Spanish vara, or yard, chiefly used at Seville, is, in some places, called *barra*. It contains seven twenty-fourths of the Paris ell; so that seventeen ells make twenty-four Spanish yards.

YARD, in *Anatomy*, the penis, or virile member; serving for the evacuating of the urine and feed.

It is also the common name for the penis in most animals.

YARD of Land, *Virgata Terre*, or *Virga Terre*, is a certain quantity of land, but that various, according to the place. At Wimbledon, in Surrey, it is only 15 acres; but in most other counties it contains 20, in some 24, in some 30, and in others 40 or 45 acres.

“Virgata terre continet 24 acras; et 4 virgatae constituent unam hidam, et quique hidæ constituent feodium militare.” MS. Abbat. Malmes. See **CARRUCATE**, **HIDE**, and **KNIGHT'S Fee**.

YARD, in *Agriculture*. See **FARM-YARD**.

YARD-Manure. See **FARM-YARD**, **COMPOST**, **DUNG**, **MANURE**, and **MANURING**.

In order to prevent the vegetation of weeds in this manure, the manure is turned up in the yard in rows when it is about two feet in depth, leaving proper room between each row to put the fresh dung from the stables, cow-houses, and hog-sties. After the manure thus thrown up has got a fair heat, it is again turned over, which mostly destroys or prevents the weeds from growing, when the manure is ready for being taken out upon the land.

The uses and powers of the long and short yard dung manure are very different in different states of it.

The opinions and practice of the farmers in the county of Norfolk, in regard to the use of long or short dung or yard manure, are much divided. Comparative trials are wanting to fully ascertain this important point.

It is, however, a prevailing idea in the above county, that long dung is best for strong land, and short for light soils; but that the general practice is that of spreading short in all cases.

In Essex, too, it is now the practice of many enlightened farmers to make use of long dung or yard manure with great advantage; though what may be said to be the general custom of the district is to clamp and employ that which is in the short state. Some farmers there, however, do not like to see their yard-manure too long in the heaps, as there is loss in turning it. In the practice of dunging for wheat, it was there observed, on long and extensive experience, that it should be *long fresh* dung, as the superiority of such dung to that which the farmers so generally prefer, such as has been moved and turned over until quite rotten, was, one load of it, worth six of that of a year old and rotten, as with such dung a crop of wheat is always certain.

In Oxfordshire, and many other counties, the same is the case with many farmers, though the common practice is to mine and turn yard-manure until it is reduced into the short state, and then to apply it to the land.

On this very interesting point of management, the writer of a late work on Agricultural Chemistry has suggested, that a slight incipient fermentation is undoubtedly of use in the heaps of this sort of manure, as by means of it a disposition is brought on in the woody fibre to decay and dissolve, when it is carried to the land, or ploughed into the soil; and that this sort of fibre is always in great excess in the refuse of the farm, especially that of the yards: but that too great a degree of fermentation is very prejudicial to such mixed yard-manure, when in the heaps; and that it is better that there should be no fermentation at all before the manure is used, than that it should be carried too far, the excess of fermentation tending to destroy and dissipate the most useful part of the manure.

During the violent fermentation which is necessary for reducing farm-yard manure to the state in which it is termed *short muck* or *dung*, not only a large quantity of fluid, but likewise of gaseous material is lost; inasmuch that the dung or manure is reduced one-half, two-thirds, or more of its weight; and that the principal elastic matter disengaged is carbonic acid with some ammonia; both of which, if retained by the moisture in the soil, would be capable of becoming an useful food or nourishment of plants.

Besides the dissipation of gaseous matter when fermentation is pushed to the extreme, as in the case of short dung, there is another disadvantage attending it in the loss of *heat*, which, if excited in the soil, is useful in promoting the germination of the seed, and in assisting the plant in the first stage of its growth, when it is most feeble and most liable to disease: and the fermentation of the manure in the

foil must be particularly favourable to the wheat-crop, in preferring a genial temperature beneath the surface late in the autumn and during winter. Moreover, it is a general principle in chemistry, that in all cases of decomposition, substances combine much more readily at the moment or time of their disengagement, than after they have been perfectly formed: and in fermentation beneath the foil the fluid matter produced is applied instantly, even while it is warm, to the organs of the plant, and consequently is more likely to be efficient, than in short dung or manure that has gone through the process; and of which all the principles have entered into new combinations.

The writings of scientific cultivators allege many arguments and facts which favour the application of yard-dung in a fresh or long state; and it is supposed, that perhaps there is no subject of investigation in which there is such an union of theoretical and practical evidence and proof.

The main objection against the use of slightly fermented or long yard-dung or manure is, that weeds rise more luxuriantly and in greater numbers where it is had recourse to: but though feeds thus carried out will certainly sprout, it is but seldom that this can be the case to any extent; and if the land be not clean of weeds, any kind of manure, long or short, fermented or unfermented, will cause their rapid growth.

The application of yard-dung, or manure in the long state, is highly advantageous with regard to the quantity or extent of the improvement which may be produced, as nearly four loads of it are mostly required to form one of the short kind.

There is another question connected with this subject, which is not of less interest or importance to the farmer to have decided, which is that of the superior advantage of consuming the straw of the farm by animals, or of having it littered and trodden into dung or manure in the yards. Many of the most enlightened farmers in the first of the above counties, the writer of the account of the agriculture of it says, are against the former of these practices, though a large part of them is in the custom of it: and they have frequently, too, recourse to the method of buying oil-cake, even often at a loss, in order that their straw may be trodden into dung or manure by fattening beasts, which is an excellent management of the yard kind.

YARD-Fallen, a term used among our farriers to express a malady to which horses are sometimes subject, which is the hanging down of the penis from its sheath between the legs, the creature not being able to draw it up again. This is caused by weakness of the peculiar muscles which should act in the drawing up; and proceeds sometimes from a violent slip or strain, sometimes from a blow on the back, and sometimes from extreme weariness in long journeys.

The method of curing this is, first to wash it with oil of roses, after this with warm white wine, and finally, to anoint it with a mixture of oil of roses and honey; it is then to be returned into its place, and kept from falling down again by a little canvas bolster. It is to be thus dressed once in twenty-four hours, till the cure is perfected.

There are some other distempers to which this part is subject in a horse, as the being foul at the end, so that the creature voids his urine in the sheath; in this case, the method of cure is to draw out the penis, and cleanse the end of it from any foulness that may be found there; then it is to be washed with butter and white wine vinegar melted together: sometimes there is a discharge of yellow stinking matter from the penis; this is peculiar to stone-horses, and

principally affects them after the time of their covering of mares.

This running is attended with a swelling of the penis, and with a pain in voiding the urine; the creature also finds a difficulty in drawing up the penis into the sheath.

The method of cure is, to dissolve in a pint of white wine an ounce of roach-alum by boiling; and four or five times a day this is to be used, injecting it up into the yard with a syringe, blood-warm. This will prove a certain cure.

YARD-Foul, the filthy, furred state of the yard and sheath in animals of the horse kind, which sometimes produces disease.

It is removed by well washing and cleaning the parts, by the free use of soft-soap and water.

YARD, Mattering of, a disease in the yards of horses, produced by different causes, in which matter is formed. It is removed by the use of cooling washes, and keeping the parts clean and perfectly free from dirt and nastiness.

YARD, Sheep. See *SHEEP-Yard* and *STANDING Fold*.

YARD, Stable. See *STABLE*.

YARD, Stack. See *FARM-Yard*, *STACK*, and *STACK-Yard*.

YARD, Straw. See *STRAW-Yard*.

YARDS, in a *Ship*, are long cylindrical pieces of fir-timber, suspended to the masts of ships, &c. to extend the sails to the wind.

All yards are either square or latteen; the former are suspended athwart the masts by the flings, at right angles, and the latter at one-third their length, obliquely.

The proportional lengths of yards are as follow, particularly in the royal navy:—Main-yard, eight-ninths the length of the main-mast; fore-yard, seven-eighths of the main-yard; mizen-yard, six-sevenths of the main-yard; main-top-fail-yard, five-sevenths of the main-yard; fore-top-fail-yard, seven-eighths of the main-top-fail-yard; mizen-top-fail-yard, two-thirds of the main-top-fail-yard; topgallant-yards to 74-gun ships, two-thirds all under three-fifths of their top-fail-yards; royal-yards, half of the top-fail-yards; cross-jack-yard and sprit-fail-yard, the same as the fore-top-fail-yard; sprit-fail-top-fail-yard and driver-yard, the same as the fore-topgallant-yard; and the fludding-fail-yards, four-sevenths of their booms.

Proportion of diameters of main and fore yards at the flings is one-quarter of an inch to every foot in their length; mizen-yard, two-thirds the diameter of the main-yard; top-fail-yards, five-eighths of an inch to every yard in the length; topgallant-yards, three-fifths of an inch to every yard in the length; royal-yards, half the diameter of the top-fail-yards; sprit-fail-yard and cross-jack-yard, the same diameter as the fore-top-fail-yard; sprit-fail-top-fail-yard and driver-yard, the same diameter as the fore-topgallant-yard; and the fludding-fail-yards, one inch diameter to every five feet in the length.

The square yards are of a cylindrical surface the greater part of their length. They taper from the middle, which are called the *flings*, towards the extremities, which are termed the *yard-arms*; and the distance between the flings and the yard-arms on each side is divided into quarters, which are distinguished into the first, second, and third quarters, and yard-arms, which are regularly tapered by the following proportions. The first quarter, or that next the flings or middle, thirty thirty-ones of the given diameter; the second quarter, seven-eighths; the third quarter, seven-tenths; and the arms or ends, three-sevenths. From a middle line struck on the tree or spar the yard is to be made from, half of the several dimensions above is to be

YARDS.

set off, and the yard then sawn to its siding; it is then canted, and a middle line struck on one of those sides, and the middle and the quarters squared up thereon from the middle line on the first side, and the same diameters set off as before, then lined and fawn square to the upper side; it is then fawn eight-square the whole length.

The main and fore yards (*fig. 17. Rigging, Plate II.*) are then trimmed sixteen-square, and rounded from one quarter on each side the slings to the outer ends, except on the aft-side, which must remain eight-square two-quarters on each side the middle. The whole is then planed fair and smooth.

In merchant ships they have a sheave-hole in their arms for the topfall-sheets, and are left square the length of the sheave-hole; but this method weakens the lower yards.

Topfall-yards (*fig. 18. Rigging, Plate II.*) being trimmed sixteen-square, are rounded and planed from the first quarter on each side the middle to their outer ends, and a sheave-hole cut from their upper side, its length within each outer end for the reef-tackles. In some merchant ships a hole is cut within the cleats for the top-gallant-sheets, but is better avoided, as it weakens the yard-arms.

Topgallant-yards (*fig. 19. Rigging, Plate II.*), royal-yards, cross-jack-yards, mizen-yards, sprit and sprit-topfall-yards, fludding-fail and driver yards, are trimmed eight-square, sixteen-square, and then rounded and planed fair and smooth from end to end throughout the length.

Battening of Yards.—Main and fore yards, main, fore, and mizen topfall-yards, have oak battens nailed on their squares nearly the same length and breadth, one inch to three-quarters of an inch thick; their ends rounded and snapped, and the edges chamfered. The fore-side has no battens.

Cleating of Yards.—The sling-cleats, *a, a*, (*fig. 17. Rigging, Plate II.*) nailed on the fore-side of the main and fore yards, are once and a quarter the given diameter of the yard in length, with a flouther one-third its length; the breadth one-fourth the length; the thickness two-thirds the breadth, made of elm, and nailed once the given diameter on each side the slings.

Stop-cleats, *b*, (*fig. 17. Rigging, Plate II.*) are made of oak, and nailed within the arms, on the fore-side and aft-side of the lower yards, one inch and a half to every yard in their length. Their length half the given diameter of the yard; the breadth one-fourth its length; and its thickness two-thirds its breadth. Yards for merchant ships have their cleats sometimes raised from the solid.

Topfall-yards have stop-cleats, nailed on the fore-side of the yard, once the given diameter on each side of the slings. Those within the arms, on the fore and after sides of the main and fore topfall-yards, three inches to every yard in the length; and mizen topfall-yards, two inches and a quarter.

Topgallant-yards the same as topfall-yards.

Royal-yard-cleats are once the diameter on each side the middle afunder, and twice their length within at the arms.

Cross-jack-yards have stop-cleats, nailed on the fore-side of the yard, half the diameter on each side of the slings; those at the arms, one inch and a half within their outer ends to every yard in length, and nailed on the fore and after sides.

Mizen-yards have stop-cleats nailed once the diameter afunder on the starboard-side, and once and a half the given diameter below the middle of the yard: those at the peak or outer end, once the diameter within.

Sprit and sprit-topfall-yards have stop-cleats nailed on their under sides; the sprit-fail-yard once the diameter on

each side the slings; the sprit-topfall-yard half the diameter one each side: those at the arms one inch and a half within their outer ends to every yard in the length; and they nail on the fore and after sides contrary to those at the slings.

Studding-fail and driver yards have stop-cleats, nailed once the given diameter afunder, at one-third the length of the yard from the inner end; those at the arms twice their length within.

Boat-yard-cleats are once the given diameter afunder at the slings; some in the middle, others one-third from the end, such as lugs, latteen, and fettees, and the length of the cleat within at the arms.

Yards are fitted at their outer ends for rigging out studding-fails. Main and fore yards have four boom-irons; one on each of their outer ends, *c*, (*fig. 17. Rigging, Plate II.*) the others at one-third the length of the boom within, *d*. The outer boom-iron is composed of a ring, a neck, and straps.

The ring, through which the boom slides, is of the same diameter in the clear as its topmalt-studding-fail boom; breadth three-eighths the diameter, and from five-eighths to three-quarters of an inch thick. In one side a lignum vitæ roller is fitted, one-third in length the diameter of the boom-ring. The neck is square, and connects the ring to the straps; each neck one inch longer than the diameter of the ring, and one-fourth its length in size.

The straps are made one inch and a quarter in length to every three feet of the yard; their breadth once and a half the breadth of the ring; thickness at the inner part, three-eighths of an inch: they increase in substance towards the neck, and are made to the shape of and let in their thickness into the yard-arm. They are bolted, and have two hoops made to the size of the yard-arm, one close to the end, and the other near the neck.

Inner boom-irons are made after the same proportion as the outer ones, but differ in shape. The straps are made to compass the yard at one-third the length of the topmalt-studding-fail boom within the end, and the ring is separated from the strap by a collar; the upper part of the ring opens with a hinge on one side, and the heel of the boom is clasped therein.

Boom-irons fix on the yards thus: the rings are parallel with the axis of the yard, in a straight direction, with a line struck upon the yard, in the middle of the square, between the upper and fore side.

Boom-irons, on the yard-arms of ships in the merchant service, differ much in shape. The ring the boom slides through is connected by a collar to a square hoop; that lets on and nails to the yard-arms, they being left square; and sometimes a round hoop to the size of the yard-arms. Others have a straight neck, projecting from straps, with a shoulder in the middle of the neck, and the part without left square. The boom-ring has a shank on the under part, with a mortise that fits the neck, and there fastened by a screw-nut, or a spring-forelock, that goes on the neck next the ring.

Topfall-yards, main and fore, commonly have boom-irons at their outer ends, like the lower yards in merchant ships. In the navy they are mostly fitted with a boom-ring, and a sprig-eye-bolt driven in the middle of their ends, parallel to its axis; and an iron hoop let in its thickness and breadth, and nailed, to prevent splitting the yard-arm. Yards that have no inner boom-irons have fiddles for the heel of the boom.

Topgallant-yards, main and fore, mizen-yards, sprit and sprit-topfall-yards, have their arms fitted with a ferrule-hoop and sprig-eye-bolts, as the topfall-yards.

Mizen-topfall and topgallant yards have hoops like the former let on their outer ends, but no eye-bolts.

Driver-yards have a sheave-hole cut through their outer end, and a hoop and eye-bolt.

The main and fore yards of large ships are sometimes made of two trees; they have each tree lined, long enough to scarf four feet beyond the first quarter, next the middle, or slings, which is in all five-eighths the length of the yard, adding four feet. The scarfs line straight, from each quarter next the middle to one-fourth the substance at the quarter next the butt, and three-fourths at the quarter next the middle, and haunches to about three inches at the butt. Each tree is then fawn as before directed, and completed thus: the scarf and haunches are trimmed straight, and out of winding on the inside, and a line struck along the middle, and a chain-coak set off, each about two feet four inches long, and one-third the diameter broad; and the butts squared across and down the sides. The coaks are raised one inch and a quarter at the butt, and sunk to the same on the other side of the middle, towards the arm; the other half is then canted thereon, set straight and out of winding, and fayed as the *masts*, (which see, and the *Plate of Masts*;) and bolted together fore and aft through the middle, in the butt of every coak; the heads are to be driven from the thinnest part of the scarf, and clenched on a ring, and the haunches nailed.

The yard is then completed as before directed, and the scarfs caulked their length and hooped; one hoop over the butt of each scarf, one in the middle of each haunch, and one over every bolt: then a fish of fir, two inches thick, and the same length and breadth as the square on the aft-side, is fayed and nailed close over all the hoops.

Another method of scarfing yards together made of two trees, which is the strongest, and takes less trees than the former, is by providing two trees that will hold the diameter beyond the fishes, and scarf together similar to the former. Then the deficiency of the diameter towards the middle is made good by long fishes of fir, from four to six inches thick, as the size of the yard may require, extending two feet in length at each end beyond the long square on the aft-side, and each of sufficient breadth to form the eight-square on the outside. The inner surfaces of the fishes are coaked and fayed close upon the yard, the coak extending near the whole length. The yard is then finished as before directed, and hooped and bolted, as in the *Plate of Mast-making*.

YARD-ARM is that half of the yard which is on either side the mast, when it lies athwart the ship. See the preceding article.

YARDS also denote places belonging to the navy, where the ships of war, &c. are laid up in harbour. See *Dock-Yards*.

YARDLEY, in *Geography*, a village of Worcestershire, which, according to the population return of the year 1811, contained 1918 inhabitants, including 121 families employed in manufactures, and 453 houses; 7 miles S.E. of Birmingham.

YARE, a river of England, in the county of Norfolk, which rises about five miles N. from New Buckenham, passes by the city of Norwich, and runs into the German ocean near Yarmouth.

YARE. See *SEGOVIA Nueva*.

YARE, among *Sailors*, implies as much as, nimble, ready, quick, expeditious. Hence, *to be yare at the helm*, as some say, signifies to set a fresh man at the helm.

YARECA, in *Geography*. See *JARECA*.

YAREE, a town of Burmah; 40 miles S.W. of Ava.

YARENSK, a town of Russia, in the province of

Uftiug, on the Vitchevda; 92 miles N.E. of Uftiug. N. lat. 62°. E. long. 47° 50'.

YARI, a town of Brasil, in the government of Para; 60 miles N.E. of Paru.

YARIN, a word used by some of the chemical writers to express the flos æris.

YARKAN, **YARKAND**, *Irken*, or *Yarkien*, in *Geography*, a town of Cashgar, or Little Bucharia, where the grand khan of the Eluth Tartars chiefly resides. The town is large, and well built of bricks dried in the sun. The environs are fertile, and the palace of the khan large, but not handsome. In 1400 this town was taken and plundered by Timur Bec; 90 miles S.E. of Cashgar. N. lat. 38° 13'. E. long. 78° 49'.

YARKAN, or *Yarkand*, suggested to be the Oerchades of Ptolemy, a river of Asia, which passes by the town of Yarkan, and after a considerable course runs into lake Lop; 100 miles S. of Tourfan.

YARM, or **YARUM**, a market-town in the W. division of the liberty of Langbaugh, in the North Riding of the county of York, England, is situated on the banks of the river Tees, 4 miles S. by W. from Stockton, 44 N.N.W. from York, and 237 in the same direction from London. In 1811 the houses in the town and parish were 361, and the inhabitants 1431. Here is a neat modern church. A market is held on Thursday, and fairs on Thursday before the 5th of April, Holy Thursday, 2d of August, and 20th of October. At Yarm was an hospital, founded before 1185; also a house of Black friars, founded about 1271, by the family of Brus or Bruce, both of which were suppressed by Henry VIII. Over the river Tees at this place is a handsome stone bridge, communicating with the county of Durham. The town, formerly more considerable than at present, still carries on a good trade by water, particularly in corn and lead for the London market. In 1761 the town suffered severely by an inundation of the river Tees.—*Beauties of England and Wales*, Yorkshire, by J. Bigland, 8vo. Lond. 1812.

YARMOUTH, GREAT, an important sea-port, borough, and market-town, in the hundred of East Flegg, and county of Norfolk, England, is situated on the E. coast of England, near the mouth of the river Yare, whence it has its name, 22 miles E. from Norwich, and 124 N.E. from London. The number of houses in the parish, according to the returns of 1811, was 3594, and the inhabitants were 17,977. A market is held here on Saturday, and a fair in Easter week. The town, which sends two members to parliament, was incorporated by James I. It is governed by a mayor, recorder, 7 aldermen, 36 common-council-men, a town-clerk, and other inferior officers. In former times, Yarmouth was a member of the Cinque Ports, and by ancient custom appointed bailiffs, who, in conjunction with the magistrates of the town, hold a court there during the herring-fair. The corporation possess also the privileges of courts of admiralty and of record. Yarmouth is singularly situated on a long, narrow, sandy peninsula, having on the E. the German ocean, and on the W. the river Yare, which, after pointing N.E. towards the sea, suddenly bends round to the S. parallel to the shore, and opens into the sea, two miles below the town. The coast near Yarmouth and southward to Lowestoft is the most easterly part of Great Britain, Yarmouth church lying in E. long. 1° 45' from Greenwich.

The first mention of this town is in *Domeyday-book*, which renders it probable, that it had its beginning in the early part of the Anglo-Saxon dynasty. When the sand-bank, on which it stands, and which, thrown up by the sea,

impeded,

YARMOUTH.

impeded, or at least diverted, the course of the Yare, was sufficiently consolidated, habitations were formed on it by the fishermen who resorted to the coast. By the influx of foreigners for the purchase and sale of fish the town increased, so as to become the most considerable port on the east coast of England. To provide for its security, Henry III. granted to the inhabitants permission to inclose the town with a moat and walls; works which, however, do not appear to have been commenced until 1285, the thirteenth year of his successor, Edward I. But when war with France broke out in 1545, an additional rampart was thrown up towards the sea, and further extended in 1587. In the following year, to guard against the Spanish invasion, out-works were constructed, the south moat was raised and planted with cannon, and a boom was laid across the entrance of the harbour. Coeval with the first fortification of Yarmouth was probably the castle, in the centre of the town. It served for some years as a prison; but in 1621 the whole was demolished. In 1642 the inhabitants of Yarmouth declared for the parliament; but it was only after the independents had gained an ascendancy in the state that a garrison was admitted here. During the American war, forts and batteries were constructed, and barracks for a considerable body of troops were erected for the defence of the place. Indebted for its original existence, and subsequent increase to the fishery, Yarmouth very early possessed a very numerous shipping. In the summer of 1310, when Edward II. ordered the several ports of England to send ships to Dublin, to convey troops over to Scotland, Yarmouth furnished six, while even Bristol and Gloucester, although so conveniently situated for that object, furnished only two between them. To form a fleet to be employed in the siege of Calais, in 1346, under Edward III., Yarmouth sent out forty-three vessels, carrying 1095 mariners; a number of men far exceeding those furnished by any other port in the kingdom; for London itself was called on for only twenty-five vessels, containing 662 mariners.

In 1797, when men for the navy were required in proportion to the tonnage of each port, Yarmouth was the ninth in order; but according to the Custom-house books of 1800 it had advanced to be the eighth, the ships of the port being 375, the tonnage 32,957, navigated by 2442 men, while Bristol possessed 186 ships, carrying 26,193 tons and 1674 men. Yarmouth was early distinguished, and still remains unrivalled, for the herring-fishery. About 1220 the abbot of St. Alban's purchased a large house in Yarmouth, "in order to lay up fish, especially herrings, which were bought in by his agents at the proper season, for the use of his abbey." Prior to 1238, the people of the opposite coast of Europe were in the habit of resorting to Yarmouth for a supply of herrings. These and other recorded facts shew that the method of preserving that fish, probably by salt, must have been known in England more than 200 years before the pretended invention of Beukels in Flanders, from whom *pickling* is said to have had its name. (See *HERRING-FISHERY*.) The herrings usually appear on the east coast of England about September, when the grand fishing season commences. The boats fitted out for the fishery are decked, and average from forty to fifty tons burthen, with a crew of eleven or twelve men to each. The vessels, with some tons of salt on board, proceed from four to twelve leagues out to sea. Each boat is provided with eighty or a hundred nets, twenty-one yards in length, and eight and a half in depth; all of which, fastened to a long rope, are let down into the sea at dusk, and drawn up at day-light. When fished, the fish are hung up in lofty buildings, and exposed, with

small intermissions, for about a month, to the smoke of a wood fire, and thus become red-herrings. Two centuries ago the fishery was also carried on in summer; but in the present times no herrings are found on the coast in that season. In the interval of the fishery, the boats are employed in catching mackerel and cod. Yarmouth trades very largely in the export of corn and malt, and in the woollen stuffs of Norwich. Timber, iron, and hemp, are imported from the Baltic, and ship-building is carried on at this place to a considerable extent.

The formation and the maintenance of the harbour of Yarmouth have required great exertion, ingenuity, and expence; for the present is the seventh recorded to have been made, and its yearly charge amounts to about 2000*l.*, which sum is defrayed by duties exacted from goods brought in. The new works were executed by Joas Johnson, a Dutchman, who had been invited from Holland for the purpose. The principal or north pier is in length 265 yards, and the south pier, which is better constructed, 340 yards: the extent of the harbour between these piers is 1111 yards; and the depth of water, in all states of the tide, being now about twenty-four feet, instead of three feet, as was the case before the erection of the piers, vessels can always lie afloat at their moorings. The well-known Yarmouth roads are formed by ranges of sand-banks, lying out parallel to and at no great distance from the shore. The channels between the banks, some of which are dry at low water, and between them and the shore, are in general narrow, but deep enough for ships of any size. The roads consequently afford most desirable shelter in stormy weather, on a tract of coast projecting a great way into the German ocean, and peculiarly destitute of accessible harbours. But the concourse of shipping in this station has, on various occasions, produced dreadful disasters, the vessels being frequently driven from their anchors, and wrecked on the banks or on the shore.

The town of Yarmouth is in form an oblong quadrangle, consisting of four principal streets, crossed at right angles by 156 lanes, called rows, so confined in breadth, that for the conveyance of goods through them, the inhabitants have adopted narrow carts, mounted upon low wheels, and drawn by one horse, the driver standing in the front of the cart. The town is inclosed by a wall on the north, east, and south sides, in length 2240 yards, which, with the west side along the river, 2030 yards, make the circuit two miles and 750 yards. Although so populous a town, Yarmouth forms but one parish, and, until a century ago, had but one church, that of St. Nicholas, which was erected by Herbert Loisinga, bishop of Norwich, in 1123; but it was greatly enlarged in 1250. It consists of a nave, two aisles, and a transept, and had lately a spire 136 feet high, a distinguished sea-mark in the middle of a long tract of low and dangerous coast; but in 1803 it was taken down. The other public buildings of Yarmouth are, the town-hall, a handsome building, with a Tuscan portico, situated near the centre of the quay; the council-room, which also serves for assemblies; the fisherman's hospital, a quadrangle, containing twenty rooms on a floor, each intended for an old fisherman and his wife; the hospital-school for maintaining and clothing thirty boys and twenty girls, at the expence of the corporation; and the charity-school for seventy boys and thirty girls, who are clothed and educated. The quay of Yarmouth is justly the boast of the town, and is one of the finest and the most extensive in Europe. Its length from the south gate to the bridge is 1014 yards, beyond which it reaches 1016 yards farther, making its whole extent a mile and 270 yards. In many places the breadth is 150 yards, and the southern part

is decorated with a range of handsome buildings. By means of a bridge across the Yare a communication is maintained with the county of Suffolk, which stretches up the west bank of the river. As a fashionable watering-place, Yarmouth is well provided with every accommodation, and consequently much frequented. On the beach a bathing-house was erected in 1759, commanding a fine view of the roads and shipping; and in 1778 a neat theatre was opened. Opposite to Yarmouth, and for about two miles north and south of the town, the coast is nearly a level common, elevated only from two to three yards above high-water mark. From the edge of the common down to the water is a gentle slope of fine sand, intermixed with loose pebbles called shingles; and as the tides rise but about six feet, the space brought under water is only a few yards. From high-water mark to the turf of the common the sands abound with marine plants, some of them rare and curious, of which an account is given by Mr. Dawson Turner in the Historical Guide to Great Yarmouth, 12mo. 1806.—*Beauties of England and Wales, Norfolk*, by J. Britton, F.S.A. 8vo. Lond. 1809.

YARMOUTH, *South*, a sea-port, borough, and market-town, in the S.W. half hundred of West Medina liberty, in the Isle of Wight, and county of Southampton, or Hampshire, England, is situated at the entrance of the little river Yare, on the N.W. coast of the island, 10 miles W. from Newport, and 97 S.W. from London. The town, which is governed by a mayor, twelve burgesses, a steward, a town-clerk, &c. was incorporated by James I., and sends two members to parliament. In 1811 the houses in the borough and parish were 88, and the inhabitants 427. A market is held here on Saturday, and two fairs annually. Yarmouth is built on a bank sloping to the sea, and seems to have been formerly much larger than it is at present. The church is situated in the middle of the town. The market-house has over it the town-hall. Here was a castle, built by Henry VIII. on the site of an ancient church, which had been destroyed by the French. This fortress is defended by some pieces of cannon, and a small garrison. Between Yarmouth and Lympington a packet sails daily.—*Beauties of England and Wales, Hampshire*, by J. Britton and E.W. Brayley, 8vo. Lond. 1808.

YARMOUTH, a sea-port town of Massachusetts, in Barnstable bay; 50 miles S.E. of Boston. N. lat. 41° 42'. W. long. 70° 10'.

YARMOUTH, a town on the west coast of Nova Scotia; 35 miles W. of Shelburn.

YARMOUTH, *North*, a town of America, in the district of Maine, and county of Cumberland, with 3295 inhabitants; 9 miles N.E. of Portland. N. lat. 43° 45'. W. long. 70° 8'.

YARMUC, or YARUN, a town of Palestine, in the district of Saphet, on a river of the same name, which runs into the lake of Tiberias, chiefly inhabited by Christians; 24 miles S.E. of Saphet.

YARMUC, a river of Syria, anciently called *Marjyas*, which runs into the Orontes, near Apamea. In 636 a battle was fought on the banks of the river, between the Christians and the Saracens, in which the former were defeated.

YARN, denotes spun wool. See WOOL, and WOOLLEN Manufacture.

YARN, *Marking*. See MARKING.

YARN, in *Rope-Making*, is spun from hemp, and is called twenty-five, twenty, and eighteen thread yarn, which differs only in the fineness; the twenty-five being finer than the twenty, &c. It is thus distinguished, because either

twenty-five, twenty, or eighteen threads a hook, make a rope of three inches in circumference, and so in proportion.

YARN, *Spun*, on board a Ship. See SPUN.

YARNALLS, in *Geography*, a town of Pennsylvania; 20 miles E. of Sunbury.

YAROVOL, a town of Russia, in the government of Tobolsk, on the Irtysh; 52 miles N. of Tobolsk.

YARRA. See JARRA.

YARRINGLES, or YARRINGLE-*Blades*, a kind of reel, or instrument, with which hanks of yarn are wound on to clues, or balls.

YARROW, in *Botany*. (See ACHILLEA.) Perhaps this old English name originated in the Spanish *Yerba*, or *Yerwa*, an herb; our Common *Achillea Millefolium* having been formerly called, in that language, *Milhojas Yerwa*, or Thousand-leaved Herb, a translation of its Latin appellation.

The leaves and flowers of the common yarrow, or *achillea millefolium* of Linnæus, which is in flower on our ditch-banks, and in dry pastures, the greatest part of the summer, are greatly recommended by some of the German physicians, as mild corroborants, vulneraries, and antispasmodics, in diarrhoeas, hemorrhages, hypochondriacal, and other disorders. They promise, says Dr. Lewis, by their sensible qualities, to be of no inconsiderable activity. They have an agreeable, though weak, aromatic smell, and a bitterish, roughish, somewhat pungent taste. The leaves, having the greatest bitterishness and astringency, are chiefly directed for medicinal use; the flowers have the strongest and most subtle smell, are remarkably acrid, and promise to be of the greatest efficacy, if the plant has any such efficacy, as an anodyne or antispasmodic. The virtue of both leaves and flowers is extracted by watery and spirituous menstrua; the astringency most perfectly by the former; their aromatic warmth and pungency by the latter; and both of them equally by a mixture of the two. The flowers, distilled with water, yield a penetrating essential oil, possessing the flavour of the milfoil in perfection; in consistence somewhat thick and tenacious; in colour very variable, from a greenish-yellow to a deep green and blueish-green, and fine blue, which differences depend in a great measure on the soil in which the plant is produced; the flowers gathered from moist fresh grounds yielding generally a blue oil, and those collected from dry commons a green one, with a greater or less admixture of yellow. The extract obtained by inspissating the yellowish tincture made in rectified spirit, is more agreeable in smell than the flowers, of a moderately warm penetrating taste, somewhat like that of camphor, but much milder, accompanied with a slight bitterishness and subastringency. The *achillea ptarmica* of Linnæus, called *sneezerwort*, or *bastard pelletory*, is perennial, grows wild on heaths, and in moist shady grounds, and is found in flower from June to the end of summer. The roots of this plant have a hot biting taste, approaching to that of pelletory of Spain, with which they nearly agree in their pharmaceutical properties, and for which they have been sometimes substituted in the shops. They are by some recommended internally as a warm stimulant and attenuant; but their principal use is as a masticatory and sternutatory. Lewis.

YARROW, in *Agriculture*, a plant of the herbage kind, which is common but useful in the pasture-field in many cases. It has long ago been noticed, by the writer of the "Essays on Rural Affairs," as valuable for cultivation in grass-lands in different sorts of soil. It succeeds on moist loams, but is most proper for dry burning gravels, sands, and

and chalks. It is said to possess the singular quality or property of resisting drought on the most arid soils; so that if a green spot appears in a burnt-up clove-fed pasture ground, it may almost with certainty be concluded to be covered with this plant. In pastures there is not any sort of plant which is eaten down more closely than this, by every kind of browsing domestic animal. It has been remarked with surprise, that spots of rich dry land, which were almost wholly filled with these plants, were eaten down barer than even white clover. It is a strong-rooted perennial plant, which has many fine leaves, of a highly aromatic smell, and which is considered as not only very acceptable, but uncommonly healthy, or even medicinal, both to sheep and black cattle.

It is found in the best bullock pastures and grounds, where it is said to be highly grateful to every sort of livestock of the cattle kind, and particularly so to sheep, which bite it as fast as it grows or rises: so that on tolerably well-flocked pastures or grounds it is rarely suffered to come into flower. The seeds of it are, therefore, to be obtained from some rich dry spot which is well stored with the plant; and if the soil be well supplied with good mouldy compost, it has been found that the yarrow may be made into a rough hay, from which it is easy to obtain seeds, which are of a peculiar winged form and appearance. It flowers late in the summer, and the seeds may be gathered about the month of October.

It is a plant that has not been observed in abundance in boggy or wet lands; but which, for dry rich soils, deserves the preference to most others for the purpose of being depastured. It is a plant that on the whole seems to merit the attention of the stock-farmer, at least in a much greater degree than he has yet bestowed upon it.

YARROW, Water. See **Water VIOLET.**

YARROW, in *Geography*, a river of Scotland, which rises in a mountain called *Yarrow Clough*, in the county of Selkirk, forms two lochs, *St. Mary's* and *Lows*, in its course, and runs into the *Tweed*, about two miles below *Selkirk*.

YARUM. See **YARM.**

YARUQUI, a plain twelve miles north-east from the city of *Quito*. This spot was pitched upon as the base of the whole operations for measuring the length of an arc of the meridian, by *Ulloa*, &c. Near it is a village of the same name.

YARWHELP, or **YARWIP,** an English name used in some places for the *agocephalus* of authors. See **GODWIT.**

YASASCHNA, in *Geography*, a town of *Russia*, in the government of *Irkutsk*, on the *Kitoi*; 68 miles N.W. of *Irkutsk*.

YASASCHNAIA, a river of *Russia*, which runs into the *Kolima*, at *Verchnei Kovimskoi*.

YASCHAMBOU, a town of *Perfia*, in the province of *Adirbeitzan*; 198 miles S.W. of *Tauris*.

YASSA, in *Modern History*, the name given among the *Tartars* to a body of laws, ascribed to the famous conqueror *Gengis-Kan*, which are still observed among the *Tartars* of *Crimea*, and other parts of *Asia*. *M. de la Croix* has given, in his life of *Gengis-Kan*, an extract of those laws, comprising twenty-one articles: the first of which inculcates the belief of one God, the Creator of heaven and earth, and to whom belong the absolute disposal and dominion of events.

YASUDA, in *Hindoo Mythology*, the name of the foster-mother of the *Hindoo Krishna*: it is said to mean the *giver of honour*.

YASUDERA, the name of the wife of *Budha*, or

Boodh, or deity of the *Hindoos*, and of other people. See **BOODH.**

YATA, in *Geography*, a town on the south coast of the island of *Catanduanes*. N. lat. 13° 52'. E. long. 124° 29'.

YATCHEVERAM, a town of *Hindoostan*, in the *Carnatic*; 25 miles S.W. of *Nellore*.

YA-TCHI, a town of *Corea*; 25 miles S.W. of *Outecheou*.

YA-TCHING, a town of *China*, in *Fo-kien*; 15 miles N.E. of *Fou-nhing*.

YATE'S RIVER, a river of *Africa*, which runs into the *Atlantic*, N. lat. 8° 8'. W. long. 12° 15'.

YATHKIED, a lake of *North America*. N. lat. 63° 10'. W. long. 98°.

YATI, the priesthood of the extensive sect of *Jaina*, in *India*. (See **JAINA**.) A *yati* is sometimes said to be more properly an ascetic, for it doth not appear that he performs any religious rite. It is his duty to read and expound to his disciples the scriptures of the *Jaina* system. See under **SECTS of Hindoos** for a general notice of the *Jainas*.

The *yatis* are devoted to religion from their infancy; for with the *Jainas* the priesthood is not hereditary, as with the orthodox *Hindoos*. A *yati* never marries, but sometimes purchases a child, adopts it, and instructs it in religious duties. Parents sometimes vow or promise their first-born to the deity, in the hope of obtaining the blessing of fecundity in their family. They serve their novice with their guru, or preceptor, and perform for him many domestic offices. After a proper period, when arrived at a sufficient age and progress in their studies, they are admitted as *yatis*. The ceremony on this occasion is simple. The novice is carried out of the town with music and rejoicing in procession, followed by a crowd of *Sravakas*, as the laity of the *Jainas* are called. (See **SRAVAKA**.) He is taken beneath a tree with milky juice. The *pipala*, or *Indian fig*, is usually preferred. A circle is formed on the ground, within which none but *yatis* are admitted. The hair, or lock, of the novice is pulled out by the root at five pulls; and camphor, musk, sandal, saffron, and sugar, are applied to the scalp: he is then stripped, and placed, with joined palms, the posture of respect and supplication, before his guru, who pronounces a mantra (see **MANTRA**) in his ear, and invests him with the dress of a *yati*, which consists of a cloth of three cubits for his loins, another of five cubits for his head, a coarse country blanket, called *kamly*, for his bed, a water-pot, a plate for his victuals, a cloth to tie them up in, a long stick to defend him, but not to injure others, and lastly, a broom of cotton-threads to sweep the ground where he sits or lies, to avert the destruction of any insect. The *Jainas* are the sect that so especially avoid shedding blood or destroying life; a tenet that leads them to ridiculous excesses, as will be seen under our article **JAINA**, in which several particulars of the *yati* are also given.

YATREB, in *Geography*, the real name of *Medina*, in *Arabia*. It is called *Medina*, or the city, by way of eminence.

YATTENDON, a village of *England*, in the county of *Berks*. Here *Alfred* overthrew the *Danes* in 876; 4 miles S.E. of *East Ilsey*.

YATTONG, a town of *Burma*; 15 miles W.N.W. of *Ava*.

YATTONUR, a town of the island of *Ceylon*; 10 miles S.W. of *Candy*.

YAUACA, a town of Peru, in the diocese of Lima, on the coast; 20 miles S.S.E. of Nasca. S. lat. 15°.

YAUGAR, a town of Burmah, on the right bank of the Irawaddy, opposite to Raynangong.

YAUGOS, a town of Peru, in the diocese of Lima; 80 miles S.E. of Lima. S. lat. 12° 40'. W. long. 75° 40'.

YAVI, a town of Peru, in the diocese of La Plata; 85 miles E.S.E. of Lipas.

YAW, in *Sea Language*, denotes the movement by which a ship deviates from the line of her course towards the right or left in heaving. See *STEADY*.

YAWL, a small light ship's boat, rowed with four to six oars, used to convey the officers to and from the ship.

YAWNING, *OSCITATIO*, an involuntary opening of the mouth, generally indicating a troublesome weariness, or an inclination to sleep. See *LUNGS*.

YAWS, in *Medicine*, a severe cutaneous disease, which is indigenous in Africa, and has been thence conveyed to the West Indies and America; so called from the resemblance of its eruptions to a raspberry, the word *yaw* in some African dialect being the name of that fruit. Nofologits have denominated it *Frambæsia*, from the French *Framboise*, which has the same signification.

The nature of this disease has been imperfectly investigated by European practitioners; and as it is perhaps never seen in England, a brief account of it will be here sufficient.

It is not easy to discover the precise character of this eruption, from the varying language of authors. An anonymous writer, who gave the first explicit account of the disease, (see *Edinb. Med. Essays*, vol. v. part 2. art. 76.) says, they are at first "level or smooth with the skin," but soon "become protuberant like pimples." Dr. Hillary, who has copied much from this writer, describes them as "pimples," though smooth and level with the skin, but soon becoming "protuberant pustules." (On the Dis. of Barbadoes, p. 339.) And Dr. Winterbottom, who has given on the whole the most perspicuous description of the disease, calls them "pustules," from their first appearance. Again, as to the contents of these eruptions, the anonymous author and Dr. Hillary say, that *no pus* nor any quantity of ichor is found in them, but speak of a little *ichor* as drying upon the surface; while Dr. Winterbottom says, they are "filled with an opaque whitish fluid," and when they burst, "a thick viscid matter is discharged." There is also some difference of opinion among the writers on this disease respecting the precursory symptoms, the earlier authors asserting, that the general health is not impaired during the first stages; but others, especially Dr. Winterbottom and Dr. Dancer, affirm, that a *febricular* usually precedes it. On the whole, however, the following appears to be the most correct account of the malady, which is to be collected from the various descriptions which have been published.

The eruption of the yaws sometimes commences without any precursory symptoms of ill health; but it is generally preceded by a slight febrile state, with languor, debility, and pains of the joints, resembling those of rheumatism. After several days, minute protuberances appear on various parts of the skin, at first smaller than the head of a pin, but gradually enlarging, in some cases to the diameter of a sixpence, and in others even to a greater extent: they are most numerous, and of the largest size, in the face, groins, axilla, and about the anus and pudenda. But the crop is not completed at once; new eruptions appear in different places, while some of the earlier ones dry off. When the cuticle is broken, a foul cruit is formed on the surface, from

under which, on the larger protuberances, red fungous excrescences often spring up, which attain different magnitudes, from that of a small raspberry to that of a large mulberry, which fruit they somewhat resemble from their granulated surfaces. When the eruption is most copious, these tubercles are of the smallest size; and when fewer, they are largest. Their duration and progress are various in different constitutions, and at different periods of life. Children suffer less severely than adults, and are more speedily freed from the disease. In them, according to Dr. Winterbottom, the duration of the yaws is from six to nine months; while in adults it is seldom cured in less than a year, and sometimes continues during two or three. The fungous tubercles attain their acme, according to the anonymous writer already quoted, more rapidly in the well-fed negroes than in those who are ill-fed and thin; and they likewise acquire a larger size in the former than in the latter. They are not possessed of much sensibility, and are not the seat of any pain, except when they appear upon the soles of the feet, where they are confined and compressed by the hard and thickened cuticle: in that situation they render the act of walking extremely painful, or altogether impracticable. They never suppurate kindly Dr. Winterbottom says, but gradually discharge a foetid glutinous fluid, which forms an ugly feat round the edges of the excrescence, and covers the upper part of it, when much elevated, with white sloughs. When they appear on any part of the body covered with hair, this gradually changes in its colour from black to white, independently of the white incrustation from the discharge. They leave no depression of the skin.

The period during which the eruption is in progress varies from a few weeks to several months. "When no more pustules are thrown out," Dr. Winterbottom observes, "and when those already upon the skin no longer increase in size, the disease is supposed to have reached its acme. About this time it happens, on some part of the body or other, that one of the pustules becomes much larger than the rest, equalling or surpassing the size of a half-crown piece: it assumes the appearance of an ulcer, and instead of being elevated above the skin like others, it is considerably depressed; the surface is foul and sloughy, and pours out an ill-conditioned ichor, which spreads very much, by corroding the surrounding sound skin: this is what is called the *masser* or *mother yaw*." When arrived at its acme, however, the eruption continues a considerable time without undergoing much alteration, often without very materially injuring the functions, and it seldom proves dangerous, except from the mischievous interference of ill-directed art.

The yaws is propagated solely by the contagion of the matter discharged from the eruption, when it is applied to the wounded or broken skin of another person, who has not previously undergone the disease. For, like the febrile eruptions, the yaws affects the same person only once during life; but, unlike them, it is not propagated by effluvia. The complaint is sometimes inoculated by flies, in those hot countries, when the skin both of the diseased and the healthy remains uncovered. Hence, Dr. Bancroft says, "none ever receive it whose skins are whole; for which reason the whites are rarely infected; but the backs of the negroes being often raw by whipping, and suffered to remain naked, they scarce ever escape it." (Nat. Hist. of Guiana, p. 385. See also Winterbottom, p. 141—3.) In Africa it is usually undergone during childhood. The period which elapses between the reception of the contagion and the commencement of the disease is no where mentioned; but in the case of a Dane, whom Dr. Adams saw at Madeira, the patient had been absent ten months

from

from the West Indies before he felt any indisposition. See Memoirs of the Med. Soc. of London.

With respect to the treatment of yaws, nothing very satisfactory is to be collected from the writings of the practitioners to whom we are indebted for the history of the disease. "The native Africans," according to Dr. Winterbottom, "never attempt to cure it until it has nearly reached its height, when the fungi have acquired their full size, and no more pultules appear." And the practitioners in the West Indies soon learned by experience, that active evacuations retard the natural progress of the disease; and that mercurials, although they suspended it, and cleared the skin of the eruption, yet left the patient still susceptible of, or rather still impregnated with, the virus, which speedily evinced its presence by a re-appearance of the symptoms more severe and tedious than before. In truth, the disease, it would seem, like the pustular and exanthematous fevers of our own climate, will only leave the constitution after it has completed the various stages of its course, and removed the susceptibility of the individual to future infection; and no medicine yet discovered has had any influence in superceding this action, or in accelerating its progress. Unless, therefore, any urgent symptoms should require alleviation, (which seldom, if ever, happens) it is advisable to dispense with the administration of medicine, and to be content with restricting the patient to a moderate and temperate regimen, during the first stage of the malady. When the eruptions begin to dry, or as soon as they cease to multiply and enlarge, the disease appears to require the same management as other slow and superficial ulcerations, accompanied with a cachectic state of the system; viz. a light but nutritious diet, a dry and wholesome air, warm clothing, moderate exercise, and a course of tonic medicine, especially of sarsaparilla, or cinchona, with the mineral acids, or with antimonials and small doses of mercury, according to the circumstances of the individual habit. The effects of mercury, however, exhibited so as to excite salivation, as the early practitioners recommend, seem to be of a very questionable nature, especially when it is unaccompanied by the vegetable decoctions; and it is certain that patients have, in some cases, soon recovered under the use of the latter, when the mercurials were omitted. The mercurial treatment, indeed, is often followed by a train of harassing symptoms, called by the negroes the *bone-ache*. "The unhappy sufferer is tormented with deep-seated pains in the bones, especially round the joints, which are occasionally aggravated to a violent degree: the periosteum becomes thickened, inflamed, and painful, and nodes are formed on the bones. When these symptoms have continued for some time, the bones are affected with caries, and even become soft and lose their form." The native Africans employ decoctions of the bark of two or three trees, which are generally purgative, as well as tonic, and likewise wash the sores with them, after carefully removing the crusts.

The *master-yaw* sometimes remains large and troublesome after the rest of the eruption has altogether disappeared. It requires to be treated with gentle eucharotics, and soon assumes a healing appearance under these applications. Stronger caustics are requisite after the cure of the *crab-yaws*, or tedious excrescences, which occur on the soles of the feet.

We may add, that the anonymous writer in the Edinb. Med. Essays, and after him Dr. Hillary and others, have deemed the yaws to be the Hebrew leprosy, described by Moses. (Leviticus, chap. xiii.) In some respects, and especially in the appearance of what is called "raw flesh" in the leprosy spots, together with *whiteness of the hair*, the de-

scription of the leprosy of the Jews is applicable to the yaws. But the leprosy is described by the great legislator as beginning in several ways, or appearing under several varieties of form, in only one of which this rising of "raw flesh" is mentioned; and the two circumstances, which all these varieties exhibited in common, were a depression of the colour and whiteness of the hair. Now this change in the colour of the hair is common to the yaws and to the leuce; and it is conjoined in the latter with cutaneous depression. It seems pretty obvious indeed, that the term leprosy was used in the Scriptures to denote several diseases of the skin, against which the law of exclusion was enforced, and others to which it did not apply. An instance of the latter occurs in Gehazi, whom we find still in the employment of Elisha, and even conversing with the king, after the leprosy had been inflicted upon him, "and his seed for ever." (2 Kings, chap. v. vi. and viii. v. 4.) See Dr. Bateman's Practical Synopsis of Cutan. Diseases; and the Works above quoted.

YAXARTES, or YAKSARTES, the *Syr-Daria*, in Geography, a river of Russia, that falls into the Aral.

YAXLEY, a small market-town in the hundred of Norman-Crofs, and county of Huntingdon, England, is situated 2 miles N.E. from Stilton, and 73 miles N. by W. from London. It has of late increased in importance from its contiguity to the barracks at Norman-Crofs. The market was for a long time discontinued, but has been recently revived, and is now held on Tuesdays. It was originally granted to the abbots of Thorney, one of whom, named De Yalkeley, who died in 1294, was native of this town. Here is also an annual fair. The church is a handsome fabric, and particularly remarkable for its lofty and well-proportioned spire, which is seen at a considerable distance on all sides. The population of the parish, in the enumeration of the year 1811, was returned at 1391, occupying 171 houses.

YAYACATLAN, a town of Mexico, in the province of Tlaxcala; 10 miles E.S.E. of Puebla de los Angeles.

YAYAUHQUITOTOLL, in Ornithology, the name of an Indian bird described by Nieremberg, remarkable for having two feathers of its tail much longer than the rest, and naked for a great way, but the end ornamented with black and blue hairs. The bird is of the size of the starling, and is beautifully variegated with green, blue, yellow, and grey.

Mr. Ray is of opinion, that this is the bird described by Marcgrave under the name *guaira-guainambi*.

YAYNANGHEOUM, or EARTH OIL CREEK, in Geography, a town of Burmah, on the Irawaddy, which receives its name from some wells of petroleum, in its neighbourhood. It is chiefly inhabited by potters; 15 miles S. of Pegonmew.

YAYYOS, or YANVOS, a town of Peru, and capital of a jurisdiction, in the archbishopric of Lima, which begins about 48 miles south-east from Lima, and extends about 75 miles in length along the Andes. It abounds in fruit, maize, wheat, barley, &c. and the pastures feed a great number of cattle for the markets of Lima; 80 miles S.S.E. of Lima.

YAZAMATES, a people who inhabited Kuban, after the Sarmates were for the most part given to Europe, five years before Alexander.

YAZOO, a river of the state of Georgia, which runs into the Mississippi, N. lat. 32° 38'. W. long. 91° 10'.

YAZOO, Little, a river of West Florida, which runs into the Mississippi, N. lat. 32° 13'. W. long. 91° 10'.

YAZVA,

YAZVA, a river of Ruffia, which runs into the Vifchera, 8 miles E. of Gerdin, in the government of Perm.

YBAGUE, a town of South America, in the kingdom of New Grenada.

YBAICABAL. See NERVIO.

YCA. See ICA.

YCAYALE. See UCAYALE.

YCHAN, a town of Corea; 13 miles S. of Hetfin.

Y-CHI, a town of China, of the third rank, in Chan-fi; 22 miles N.N.E. of Kiai.

YCONOMIUS. See OECONOMUS.

YDALA, in *Geography*, a town of Sweden, in Blekingen; 10 miles S.S.E. of Kongfack.

YDRIA. See HYDRIA.

YDRINUS, or HYDRINUS, a name given by some to the *opbites*, or ferpent-ftone.

YDRUS, in *Ancient Geography*, a mountain of Hifpania. Jerome.

YE, or WYE, in *Geography*, a river of Holland, which paffes by Amfterdam, and runs into the Zuyder See, about 6 miles below.

YEA WATER, a river of Scotland, which runs into the Nith, 2 miles E. of Lochmaben.

YEADON, a township of Yorkfhire, in the Weft Riding, with 1695 inhabitants, including 476 employed in trade and manufactures; 3 miles S. of Outley.

YEALME, a river of England, in the county of Devon, which runs into the Englifh Channel, 1 mile N.N.W. of Stoke Point.

YEANGLAW, a town of Birmah; 7 miles S. of Pegongmew.

YEANING, among *Sheep-Farmers*, a term ufed to fignify the act of bringing forth the young in animals of the fheep kind. It is faid that in the polled breeds of fheep the lambs are yeaned with the greateft eafe and facility, and in the large-horned breeds with the greateft difficulty and inconvenience. See SHEEP.

YEANING-Time, the feafon of yeaning in fheep, which is different in different breeds of them, but probably the moft early in the Dorfetfhire breed, as they may be managed fo as to lamb at a very early period. In general, however, the management is fuch, that the lambs are yeaned or brought forth from towards the latter end of February to the beginning of the following month, and later in fome cafes and fituations. When yeaned too early there is often great lofs, on account of the inclemency of the feafon, unlefs the ewes have been kept very well for fome time before it takes place. Confequently, in all fuch cafes, they fhould, for fome weeks at leaft before the yeaning time, be plentifully fupplied with proper food, fo that the health and ftrength of them and that of their young may be promoted and preferred againft this period. Proper fheltered fituations, yards, and fpoats of ground, fhould alfo be provided for this purpofe, by which the lives of numbers may be faved. See SHEEP.

In all bad cafes of yeaning, the ewes fhould be well fupplied by good oatmeal gruel and cordial drinks.

YEANLING, a term applied to the young of the fheep kind when newly yeaned. See LAMB.

YEAR, ANNUS, in the full extent of the word, is a fystem or cycle of feveral months; ufually twelve.

Others define year, in the general, a period, or fpace of time, meafured by the revolution of fome celeftial body in its orbit.

Thus, the time in which the fixed ftars make a revolution is called the great year. And the times in which Jupiter, Saturn, the fun, moon, &c. finifh their revolutions, and

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return to the fame point of the zodiac, are refpectively called the years of Jupiter and Saturn; and the folar and the lunar years.

As there is no luminary whole changes and revolutions are fo frequent and remarkable as thofe of the moon, fome have thought that all nations at firft meafured and divided time according to the various afpects of this planet. Accordingly the Egyptian year originally confifted of a fingle lunation; afterwards it included two or three months, and was defined by the ftated returns of the feafons. It has been alfo fuppofed, that feveral ages muft have elapfed before the idea of adjusting the length of the year to the courfe of the fun became general, though repeated obfervations were made on his motion in the ecliptic. The Indians, the Chaldeans, and Egyptians, who in a very early period applied their attention to aftronomy, at length found, by comparing the motions of the fun and moon together, that one revolution of the former was equal to about 12 of the latter; and hence was formed a year of 12 lunations, in every one of which were reckoned 30 days: and hence alfo, it is faid, arose the divifion of the ecliptic into 360 equal parts or degrees.

Year, properly, and by way of eminence fo called, is the folar year; or the fpace of time in which the fun moves through the twelve figns of the ecliptic.

This, by the obfervations of Caffini, Bianchini, and de la Hire, contains 365 days, 5 hours, and 49 minutes; which is the quantity of the year affumed by the authors of the Gregorian calendar.

But in the civil or popular account, this year only contains 365 days; except every fourth, which contains 366.

The viciffitude of feafons feem to have given occafion to the firft institution of the year. Man, naturally curious to know the caufe of that diverfity, foon found it was the proximity and diftance of the fun; and, upon this, gave the name year to the fpace of time in which that luminary, performing his whole courfe, returned to the fame point of his orbit.

And hence, as it was on account of the feafons, in a great meafure, that the year was instituted, their chief regard and attention were, that the fame parts of the year fhould always correpond to the fame feafons; *i. e.* that the beginning of the year fhould always be when the fun was in the fame point of his orbit; and that they fhould keep pace, come round, and end together.

This, different nations aimed to attain by different ways; making the year to commence from different points of the zodiac, and even making the time of his progrefs different. So that fome of their years were much more perfect than others, but none of them quite juft; *i. e.* none of them whole parts did not fhift, with regard to the parts of the fun's courfe.

We may naturally fuppofe that the commencement of the year would be determined by the date of fome confiderable event, fuch as the creation of the world, the univerfal deluge, a conjunction of planets, the incarnation of our Saviour, &c.; and of courfe it has been referred to different points in the ecliptic. The Chaldean and Egyptian years were dated from the autumnal equinox. The ecclefiaftical year of the Jews began in the fpring; but in civil affairs they retained the epoch of the Egyptian year. The ancient Chinefe reckoned from the new moon, neareft to the middle of Aquarius; but according to fome recent accounts, the beginning of their year was transferred (B. C. 1740) to the new moon neareft to the winter folftice. This likewife is the date of the Japanefe year. Diemfchid,

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or Gemshid, king of Persia, observed on the day of his public entry into Persepolis, that the sun entered into Aries; and in commemoration of this fortunate event and coincidence, he ordained the beginning of the year to be removed from the autumnal to the vernal equinox. This epoch was denominated *Neuruz*, viz. New-day, and is still celebrated with great pomp and festivity.

The ancient Swedish year commenced at the winter solstice, or rather at the time of the sun's appearance in the horizon, after an absence of about 40 days. The feast of this epoch was solemnized on the 20th day after the solstice. Some of the Grecian states computed from the vernal, some from the autumnal equinox, and others from the summer tropic. The year of Romulus commenced in March, and that of Numa in January. The Turks and Arabs date the year from the 16th of July; and the American Indians reckon from the first appearance of the new moon of the vernal equinox. The church of Rome has fixed new-year's day on the Sunday that corresponds with the full moon of the same season. The Venetians, Florentines, and Pisans in Italy, and the inhabitants of Treves in Germany, begin the year at the vernal equinox. The ancient clergy reckon from the 25th of March; and this method was observed in Britain until the introduction of the New Style, A.D. 1752, after which our year commenced on the first day of January. See *EPOCHA and CHRONOLOGY*.

They were the Egyptians, if we may credit Herodotus, that first formed the year, which was luni-solar, making it to contain 360 days, which they subdivided into 12 months.

This year was corrected by the Thebans, who added to it five intercalary days. The Medes and Persians, who were anciently a part of the Assyrian empire, adopted the old Chaldean year of 360 days, which they afterwards reformed.

Some missionaries report, that the luni-solar year was corrected in China; that the year of the Indians contained 360 days, and was divided into 24 months. But besides this form of the year, the Indians used another, for astronomical purposes, consisting of 365 d. 15 h. 31' 15"; which Indian days and hours are equal to 365 d. 6 h. 12' 30", according to our mode of computation. Or, as this year is federal, if you subtract 21' 35" on account of the motion of the stars in longitude, the Indian tropical year will be 365 d. 5 h. 50' 55". The Mexicans received the luni-solar year from the Indians or Chinese, and divided it into 18 months of 20 days; adding five days to the last month, and dating the year from March. That the ancient Grecian year was luni-solar, is evident from many testimonies of Hippocrates, Plato, and Pliny. The Latin year, before Numa's correction of it, consisted of 360 days, 304 of which were divided into 10 months; and to these were added two private months, not named in the calendar. Plut. in Vit. Numa. Serv. et Virgil Georg. l. i. v. 43.

It has been said that Mercurius Trimegistus added five days to the Egyptian year of 360 days. And, on this footing, Thales is said to have instituted the year among the Greeks; though that form of the year did not hold throughout all Greece. Add, that the Jewish, Syrian, Roman, Persian, Ethiopic, Arabic, &c. years were all different.

In effect, considering the imperfect state of astronomy in those ages, it is no wonder different people should disagree in the computation of the sun's course. We are even assured by Diod. Siculus (lib. i.), Plutarch in Numa, and Pliny (lib. vii. cap. 48.), that the Egyptian year itself was at first very different from that now represented.

The imperfection of the luni-solar year became more and more apparent as the arts and sciences improved; but

the necessary correction depended upon a competent knowledge of the solar year. Every nation, by degrees, invented or adopted the method of intercalating a few days at certain intervals. The author of the discovery is not certainly known: the Egyptians have claimed the merit of it; and the Theban priests have attributed it to Hermes or Thoth. It appears that they were acquainted with the year of 365 days in a very remote period. (Herodot. l. iv. c. 4. Strabo Geog. l. xvii. Syncell. Chron. p. 121.) The length of the solar year was represented in a golden circle fixed upon the tomb of Olymandes; and this circle was 365 cubits in circumference, having on each cubit a day of the year inscribed, together with the heliacal risings or settings of the stars. This Olymandes is said to have flourished either in the 13th or 11th century before the Christian era. For perpetuating the memory of this correction, though inaccurate, the first month of the year was distinguished by the title Thoth, or Sothis, which was the Egyptian appellation of the dog-star, the heliacal rising of which announced the inundation of the Nile. Hence, it is said, originated the fable, invented of the priests of Thebes, that Mercury, or Thoth, regulated the civil year by extending it, as we have already observed, to 365 days; and, in return, the first month was called by his name. See *Egyptian YEAR*, and *CANICULAR Year*.

The method of correcting the civil year, by the addition of five epagomenæ, was communicated by the Chaldeans and Egyptians to other nations; but it has not been ascertained at what epoch the solar year was observed to be almost 6 hours longer than the civil year of 365 days. The priests of Thebes claimed the merit of the discovery (Diod. Sicul. l. i. p. 59. Strabo Geog. l. xvii.); but Herodotus takes no notice of it; nor Thales, who, on his return from Egypt, taught the Greeks to form a solar year of 365 days without any intercalation. Plato and Eudexus are said to have obtained it, as a secret, from the Egyptians, about 80 years after Herodotus, and to have carried it into Greece; which shews that the knowledge of this form of the year was then recent, and confined to a few of the learned, while the old form was still retained, and the Egyptians used no intercalation until the corrected Julian year was received at Alexandria by the order of Augustus; and even at this time the Greeks and Romans, who resided in Egypt, alone obeyed the imperial mandate. The superstitious nations refused to admit any addition to a form of the year which had been so long established among them.

The reformed year of the Chinese consisted of 365 d. 5 h. 20', which were divided into 24 months, each of these equal parts including 15 d. 5 h. 14' 2". (Du Halde. Hyde. Relig. Vet. Perf.) The quantity of the Indian year was somewhat different from that of the Chinese: the lunar year contained 364 d. 22 gurris, 1 pull; and the solar year 365 d. 15 gurris, 30 pulls, 22½ puts; 60 puts = 1 pull, 60 pulls = 1 gurri, and 60 gurris = 1 day: so that their solar or rather federal year consisted of 365 d. 6 h. 12' 7". This mode of computation is used by the Bramins, by the Moguls, and by other Mahometans in India.

YEAR, Solar, is the interval of time in which the sun finishes his course through the zodiac; or in which he returns to the same point of it from whence he had departed.

This, according to our account, is 365 days, 5 hours, 49 minutes; though some astronomers make it a few seconds, and some a whole minute less; as Kepler, for instance, who makes it 365 days, 5 hours, 48 minutes, 57 seconds, 39 thirds. Ricciolus, and Tycho Brahe, 365 days, 5 hours, 48 minutes.

The solar year is either *astronomical* or *civil*.

YEAR, *Solar Astronomical*, is that determined precisely by the observations of astronomy; and is of two kinds, *tropical* and *fidereal* or *astral*.

YEAR, *Tropical* or *Natural*, is the time which the sun employs in passing through the zodiac, or from one equinox, or one tropic, to the same again; which, as before observed, is 365 days, 5 hours, 49 minutes; or, more accurately, 365 d. 5 h. 48' 48". This is the only proper or natural year, because it always keeps the same seasons to the same months.

In order to find the tropical year, observe the meridian altitude, a , of the sun on the day nearest to the equinox; then the next year take its meridian altitude on two following days, one when its altitude, m , is less than a , and the next when its altitude, n , is greater than a , then $n - m$ is the increase of the sun's declination in 24 hours; also, when the declination has increased by the quantity $a - m$ from the time when the meridian altitude, m , was observed, the declination will then become a ; and as we may consider the increase of declination to be uniform for a day, we have $n - m : a - m :: 24$ hours, the interval from the time when the sun was on the meridian on the first of the two days, till the sun has the same declination a , as at the observation the year before; and this time, added to the time when the sun's altitude m was observed, gives the time when the sun's place in the ecliptic had the same situation in respect to the equinoctial points, which it had at the time of the observation the preceding year; and the interval of these times is the length of a tropical year.

If, instead of repeating the second observation the next year, there be an interval of several years, and you divide the interval between the times when the declination was found to be the same, by the number of years, you will get the tropical year more exactly.

YEAR, *Sidereal* or *Astral*, is the space of time in which the sun, going from any fixed star, returns to the same. This consists of 365 days, 6 hours, 6 minutes, 11,5 seconds.

To find the length of a fidereal year. On any day when the sun is at Z on the meridian (*Plate XXI. fig. 12.*), take the difference, Zm , between the sun's right ascension when it passes the meridian, and that of a fixed star, S ; and when the sun returns to the same part of the heavens the next year, compare its right ascension with that of the same star for two days, one when their difference, bm , of right ascensions is less, and the other when the difference, fm , is greater than the difference, Zm , before observed; then bf is the increase of the sun's right ascension in the time, t ; and as the increase of right ascension may be considered as uniform for a small time, we have $bf : bZ :: t : \text{the time, } T$, in which the right ascension is increased from b to Z ; this time, T , therefore, added to the time of the observed right ascension at b , gives the time when the sun is at the same distance, Zm , in right ascension from the star, which it was when observed at Z the year before; the interval of these times is therefore the length of the fidereal year. The best time for these observations is about March 25, June 20, September 17, December 20, the sun's motion in right ascension being then uniform. Instead of observing the difference of the right ascensions, you may observe that of their longitudes.

If, instead of repeating the second observations the year after, there be an interval of several years, and you divide the observed interval of time when the difference of their right ascensions was found to be equal, by the number of

years, you will have the length of a fidereal year more exactly.

The precession being given (see PRECESSION), and also the length of a tropical year, the length of a fidereal year may be found by this proportion; $360^\circ - 50'' : 25 : 360^\circ :: 365 \text{ d. } 5 \text{ h. } 48' 48'' : 365 \text{ d. } 6 \text{ h. } 9' 11\frac{1}{2}''$ the length of the fidereal year.

YEAR, *Anomalistical*, is the time that elapses from the sun's leaving its apogee till it returns to it: and as the progressive motion of the apogee in a year is $11'' 75$, the anomalistical year must be longer than the fidereal year, by the time which the sun takes in moving over $11'' 75$ of longitude at its apogee; but when the sun is in its apogee, its motion in longitude is $58' 13''$ in 24 hours: hence $58' 13'' : 11'' 75 :: 24 \text{ hours} : 4' 50\frac{2}{3}''$, which added to $365 \text{ d. } 6 \text{ h. } 9' 11\frac{1}{2}''$, gives $365 \text{ d. } 6 \text{ h. } 14' 2\frac{1}{2}''$, the length of the anomalistical year. M. de la Lande determined this motion of the apogee from the observations of M. de la Hire, and those of Dr. Maskelyne. Cassini made it the same. This year is sometimes used by astronomers. See ANOMALISTICAL Year.

YEAR, *Civil*, is that form of year which each nation has contrived for the computation of time: or the *civil* is the tropical year, considered as only consisting of a certain number of whole days; the odd hours and minutes being set aside, to render the computation of time in the common occasions of life more easy.

Hence, as the tropical year is 365 days, 5 hours, 48 minutes, 48 seconds, the civil year is 365 days. And hence, also, as it is necessary to keep pace with the heavens, it is required that every fourth year should consist of 366 days.

Hence, lastly, the civil year is either *common* or *bissextile*.

YEAR, the *Common Civil*, is that consisting of 365 days. This, therefore, has seven months of 31 days each, four of 30 days, and one of 28 days; according to the well-known canon:

Thirty days hath September,
April, June, and November.

February twenty-eight alone,

And all the rest have thirty-one.

YEAR, *Bissextile*, or *Leap*, is that consisting of 366 days; or it has one day extraordinary; which day is called the *intercalary*, or *bissextile* day.

This intercalary, or additional day to every fourth year, was first appointed by Julius Cæsar; who, to make the civil year keep pace with the tropical ones, contrived that the six hours which the former wanted of being equal to the latter, should, in four years, make a whole day, and be added before the twenty-fourth, or to the twenty-third of February, which was their sixth of the calends of March. Hence, as in that year, they reckon this day twice over, or add *bis sexto calendas*, the year itself came to be called *bis sextus*, and *Bissextile*; which see.

The intercalary day, however, among us, is not introduced by telling the twenty-third of February twice over, but by adding a day after the twenty-eighth of February; which month, in that year, contains twenty-nine days. See LEAP-Year.

A farther reformation in this year was made by pope Gregory. See Gregorian YEAR, and CALENDAR.

YEAR, *Lunar*, is a system of twelve lunar months. See LUNAR.

Hence, from the two kinds of synodical lunar months, there arise two kinds of lunar years; the one *astronomical*, the other *civil*.

YEAR.

YEAR, *Lunar Astronomical*, consists of twelve lunar synodical months; and therefore contains 354 days, 8 hours, 48 minutes, 36 seconds; and is, therefore, 10 days, 21 hours, 0 minute, 12 seconds, shorter than the solar year. This is the foundation of the *Epact*; which see.

YEAR, *Lunar Civil*, is either *common* or *embolismic*.

YEAR, the *Common Lunar*, consists of twelve lunar civil months; and therefore contains 354 days.

YEAR, the *Embolismic* or *Intercalary*, consists of thirteen lunar civil months; and therefore contains 384 days. See **EMBOLISMIC**.

Thus far we have considered years and months, with a view to the principles of astronomy, on which the division is founded. By this, the various forms of civil years that have anciently obtained, or still do obtain in divers nations, are to be examined.

YEAR, *Ancient Roman*, or *Latin*, was the lunar year, which, as first settled by Romulus, only consisted of ten months; viz. 1. March, containing 31 days. 2. April, 30. 3. May, 31. 4. June, 30. 5. Quintilis, 31. 6. Sextilis, 30. 7. September, 30. 8. October, 31. 9. November, 30. 10. December, 30. In all 304 days, which came short of the true lunar year by 50 days; and of the solar, by 61 days. Hence, the beginning of Romulus's year was vague, and unfixed to any precise season; to remove which inconvenience, that prince ordered for many days to be added yearly as would make the state of the heavens correspond to the first month, without incorporating these additional days, or calling them by the name of any month. Censorius, Varro, and other Roman authors, agree, that the ancient Latin year was divided into 10 months, which appears from a passage in Plutarch, that two intercalary months were added to every year; which two months were not inserted in the calendar. Romulus retained the former names and number of the months; but adapted their quantity nearly to the course of the sun, assigning, as we have stated, six of them 30 days, and to the remaining four 31 days each, and he transferred the beginning of the year from April to March: December was the 10th month, as its name implies; after which the two intercalary months were inserted, but no names were affixed to them till the succeeding reign.

Numa Pompilius corrected the irregular constitution of Romulus's year, and composed two new months, January and February, of the days that were used to be added to the former year. Thus, Numa's year consisted of twelve months; viz. 1. January, containing 29 days. 2. February, 28. 3. March, 31. 4. April, 29. 5. May, 31. 6. June, 29. 7. Quintilis, 31. 8. Sextilis, 29. 9. September, 29. 10. October, 31. 11. November, 29. 12. December, 29. In all 355 days, which exceeds the quantity of a lunar civil year by one day; and that of a lunar astronomical year by 15 hours, 11 minutes, 24 seconds, but comes short of the common solar year by ten days; so that its beginning also was vague and unfixed.

Numa, however, desiring to have it fixed to the winter solstice, ordered 22 days to be intercalated in February every second year, 23 every fourth, 22 every sixth, and 23 every eighth year, making in all 90 days.

But this rule failing to keep matters even, recourse was had to a new way of intercalating; and, instead of twenty-three days every eighth year, only fifteen were added; and the care of the whole was committed to the pontifex maximus, who neglecting the trust, let things run to the utmost confusion. And thus the Roman year stood till Julius Cæsar made a reformation. See **CALENDAR**.

For the manner of reckoning the days of the Roman months, see **CALENDS**, **NONES**, and **IDES**.

YEAR, *Julian*, is a solar year, containing, commonly, 365 days; though every fourth year, called *bissextile*, it contains 366.

The months, &c. of the Julian year stand thus: 1. January, 31 days. 2. February, 28. 3. March, 31. 4. April, 30. 5. May, 31. 6. June, 30. 7. July, 31. 8. August, 31. 9. September, 30. 10. October, 31. 11. November, 30. 12. December, 31. But every *bissextile* year, a day is added after the 28th of February; which month then contains 29 days.

The astronomical quantity, therefore, of the Julian year is 365 days, 6 hours; which exceeds the true solar year by somewhat more than eleven minutes; which excess, in 131 years, amounts to a whole day. So that the times of the equinoxes go backward, and fall earlier by one day in about 131 or 130 years. And thus the Roman year stood, till the reformation made in it by pope Gregory.

For this form of the year, we are indebted to Julius Cæsar; who, in the contrivance of it, was assisted by Sosigenes, a famous mathematician, called over from Egypt for this very purpose; who, to supply the defect of sixty-seven days, which had been lost through the fault of the pontifices, and to fix the beginning of the year to the winter solstice, made that year to consist of 15 months, or 445 days; which, for that reason, is used to be called *annus confusionis*, the year of confusion. See **JULIAN CALENDAR**.

YEAR, *Gregorian*, is the Julian year corrected by this rule; that whereas, on the common footing, every secular or hundredth year is *bissextile*; on the new footing, three of them are common years, and only the fourth is *bissextile*.

The error of eleven minutes in the Julian year, little as it was, yet, by being repeated over and over, at length became considerable; and from the time when Cæsar made his correction, was grown into thirteen days, by which means the equinoxes were greatly disturbed. In the year 1582, the equinoxes were fallen ten days, and the full moons four days, more backwards than they were in the time of the Nicene council; i. e. the equinox, which in the year 325, when that council was held, fell on the twenty-first of March, was in 1582 thrown back to the tenth, and the full moon was removed from the fifth to the first of April. To remedy this irregularity, which was still increasing, pope Gregory XIII., in the year just mentioned, called together the chief astronomers of his time, and concerted this correction; and, to restore the equinoxes to their place, threw out the ten days that had been got from the time of the council of Nice, and which had shifted the fifth of October to the fifteenth. He exchanged the lunar cycle for that of the epacts; and in order to restore the spring equinox to the Nicene standard, subtracted ten days out of the month of October, in that year (1582), making the fourth to be the fifteenth; and by this means, the vernal equinox has been restored to the twenty-first of March. Moreover, it was endeavoured, by the omission of three intercalary days in four hundred years, to make the civil year keep pace with the solar for time to come. See **CALENDAR**.

In the year 1700, the error of ten days was grown to eleven; upon which the Protestant states of Germany, to prevent farther confusion, accepted the Gregorian correction. See **REFORMED CALENDAR**, and **STYLE**.

Yet is even the Gregorian year far from being perfect; for we have shewn, that in four centuries the Julian year gains three days, one hour, twenty minutes; but it is only the three days that are kept out in the Gregorian year; fo

that

that there is still an excess of one hour, twenty minutes, in four centuries, which, in seventy-two centuries, amount to a whole day.

The Gregorian year is now used in most countries in Europe. From the difference between this and the Julian year arises the distinction of the old or Julian, and new or *Gregorian Style*; which see.

YEAR, *Egyptian*, called also the year of Nabonassar, on account of the *epocha* of Nabonassar, is the solar year of 365 days, divided into twelve months, of thirty days each, besides five intercalary days, added at the end.

The names, &c. of the months are as follow: 1. Thoth. 2. Paophi. 3. Athyr. 4. Chojac. 5. Tybi. 6. Mecheir. 7. Phamenoth. 8. Pharmuthi. 9. Pachon. 10. Pauni. 11. Epiphi. 12. Mefori; beside the *ἡμέραι επαγομένηαι*.

Hence, as the Egyptian year in every four years loses a whole day of the Julian year, because it neglects the six hours, which make a leap-day once in four years, its beginning, in the space of 1460 years, runs through every part of the Julian year; which space elapsed, they meet again; and, therefore, it is justly called the *erratic year*. And because it returns to the same day of the Julian year after 1460 Julian years, this circle is called the Sothic period. See CANICULAR Year.

This year is used by Ptolemy, in his *Almagest*; so that the knowledge of it is of great use in astronomy, for comparing the ancient observations with the modern.

This defultory form was applied by the Egyptians to civil uses, till Antony and Cleopatra were defeated; and the mathematicians and astronomers used it till the time of Ptolemy.

The ancient Egyptians, we are told by Diodorus Siculus (lib. i.), Plutarch (in the Life of Numa), and Pliny (lib. vii. c. 48.), measured their years by the course of the moon. At first, they were only one month, then three, then four, like that of the Arcadians; and then six, like that of the people of Acarnania. Those authors add, that it is on this account they reckon such a vast number of years from the beginning of the world; and that, in the history of their kings, we meet with some who lived 1000 or 1200 years.

But Herodotus is silent on this point: he only says, that the Egyptian year consisted of twelve months, as we have above represented it. Besides, we learn from Scripture, that from the times of the flood, the year was composed of twelve months; Cham, consequently, and his son Mizraim, the founder of the Egyptian monarchy, must have had that custom; and it is no way probable his descendants should alter it. Add, that Plutarch speaks of it with great uncertainty, and as no more than a report; and Diod. Siculus, as only a conjecture of authors whom he does not name; and who, in all probability, might have framed this hypothesis to reconcile the Egyptian chronology to that of some other nations.

F. Kircher, however, maintains, that besides the solar year, there were some of the nomes or cantons of Egypt which used a lunar one; and that in the remotest ages there were some who took a revolution of the moon, that is, a month for a year; and others, who finding the year too short, made it two months, others three, and others four, &c. (*Oedip. Egypt.* tom. ii. p. 252.) A late author observes, that Varro has affirmed of all nations, what we have here quoted of the Egyptians; and adds, that Lactantius takes him to talk on that subject. We do not know in what places of Varro, or Lactantius, he has seen this: all we can say is, that Lactantius (*Divin. Inst.* lib. iii. c. 13.), where he gives Varro's opinion, only represents him as speaking of the Egyptians. However, St. Augustine

(*De Civit. Dei*, lib. xv. c. 14.) shews, that the years of the patriarchs mentioned in Scripture are like ours, and not one of ours equal to ten of theirs, as, it appears, had been the opinion of some people.

Upon the Egyptians being subdued by the Romans, they received the Julian year, though with some alteration; for they still retained their ancient months, with the five *ἡμέραι επαγομένηαι*, and, every fourth year, intercalated another day between the 28th and 29th of August. Add, that the beginning of their year, or the first day of the month Thoth, answered to the 29th of August of the Julian year, or to the 30th if it happened to be leap-year.

This year, thus reformed, and called the fixed Egyptian year, was called the *annus Aëtiacus*, as being instituted soon after the battle of Actium.

YEAR, *Ancient Greek*, was lunar, consisting of 12 months, which, at first, had 30 days a-piece, then alternately 30 and 29 days, computed from the first appearance of the new moon; with the addition of an embolismic month of 30 days, every 3d, 5th, 8th, 11th, 14th, 16th, and 19th years of a cycle of 19 years; in order to keep the new and full moons to the same terms or seasons of the year. With this correction, though erroneous, it subsisted until the time of Herodotus and Hippocrates. Solon attempted the reformation of the calendar by the introduction of the complete and defective months; i. e. months of 30 and of 29 days; for two lunations made 59 days, nearly. Thus amended the year became lunar, and was adopted at Athens; but in other states of Greece the ancient form was retained.

Their year commenced with the new moon, the full moon of which comes next after the summer solstice. The order, &c. of their months was thus: 1. Ἑκατομβραῖων, containing 29 days. 2. Μπαγαγεντιών, 30. 3. Βοηδρομιών, 29. 4. Μαιμακτηριών, 30. 5. Πυκαΐων, 29. 6. Ποσειδιών, 30. 7. Γαμηλιών, 29. 8. Αβδηρητιών, 30. 9. Ελαφβολιών, 30. 10. Μυυθιών, 30. 11. Φαργηλιών, 29. 12. Σκροφοριών, 30.

The Macedonians had other names for their months; so had the Syro-Macedonians, Smyrnæans, Tyrians; so also the Cyprians, Paphians; and so the Bithynians, &c.

YEAR, *Ancient Macedonian*, is a lunar year, only differing from the Attic, in the names and order of the months; the first Macedonian month agreeing with the Attic *Μακμακτηρίων*: as the Macedonian year commenced not at the summer solstice, but at the autumnal equinox. The months stand thus: 1. Διος, 30 days. 2. Απυλλαιος, 29. 3. Αυδουαιος, 30. 4. Πιεργιος, 29. 5. Δυρριος, 30. 6. Ξανθικος, 29. 7. Αρτιμισιος, 30. 8. Δαισιος, 29. 9. Πανικος, 30. 10. Λαιος. 11. Κοστιαιος, 30. 12. Ἰππεριαιος.

YEAR, *Modern Macedonian*, is a solar year, whose beginning is fixed for the first of January of the Julian year, with which it perfectly agrees.

This year was particularly called the *Attic year*; and the intercalary month, after Posideon, was called *Ποσειδιών β*, or *latter Posideon*.

YEAR, *Ancient Jewish*, is a lunar year, consisting, commonly, of eleven months, which alternately contain 30 and 29 days.

It was made to agree with the solar year, either by the adding of 11, and sometimes 12 days, at the end of the year, or by an embolismic month.

Tradition reports, that Abraham preserved in his family, and transmitted to posterity, the Chaldean form of the year, which originally consisted of 360 days (compare *Dan.* vii. 25. xii. 7. with *Rev.* xii. to xiv. xi. 2, 3.), and remained without any correction until the date of the Nabonassarean era. If any intercalation was used by the Jews, Moses

YEAR.

Moses appears to have been unacquainted with it. After the Babylonish captivity, they adopted the solar year. When they were subjected to the Syro-Macedonian yoke (B.C. 312), they were compelled to admit the lunar year into their calendar. To adjust this year to the course of the sun, they added, at certain periods, a month to Adar, and called it Ve-Adar. They composed also a cycle of 19 years; in seven of which they inserted the intercalary month, *viz.* in the 3d, 6th, 8th, 11th, 14th, 17th, and 19th. The design of this correction was, to bring the 15th day of Nisan to the equinoctial point, and to regulate the courses of the seasons, and of the feasts, in such a manner, as that the corn might be ripe at the passover, as the law required.

The names and quantities of the months stand thus: 1. Nisan, or Abib, containing 30 days. 2. Ijar, or Zius, 29. 3. Siban, or Siwan, 30. 4. Thamuz, or Tamuz, 29. 5. Ab, 30. 6. Elul, 29. 7. Tifri, or Ethanim, 30. 8. Marchefvan, or Bul, 29. 9. Cisleu, 30. 10. Tebeth, 29. 11. Sabat, or Schebeth, 30. 12. Adar, in the embolismic year, 30. Adar, in the common year, was but 29.

Note.—In the defective year, Cisleu was only 29 days; and in the redundant year, Marchefvan was 30.

YEAR, *Modern Jewish*, is likewise lunar, consisting, in common years, of 12 months, but of 13 in embolismic years; which in a cycle of 19 years are, the 3d, 6th, 8th, 11th, 14th, 17th, and 19th. Its beginning is fixed to the new moon next after the autumnal equinox.

The names, &c. of the months are, 1. Tifri, containing 30 days. 2. Marchefvan, 29. 3. Cisleu, 30. 4. Tebeth, 29. 5. Schebeth, 29. 6. Adar, 29. 7. Veadar, in the embolismic year, 30. 8. Nisan, 30. 9. Ijar, 29. 10. Siyan, 30. 11. Thamuz, 29. 12. Ab, 30. 13. Elul, 29.

YEAR, *Syrian*, is a solar year, having its beginning fixed to the beginning of October, in the Julian year; from which it only differs in the names of the months, the quantities being the same, as follows:

1. Tifirin, answering to our October, and containing 31 days. 2. Latter-Tifirin, containing, like our November, 30. 3. Canun, 31. 4. Latter Canun, 31. 5. Shabat, 28, or 29 in a leap-year. 6. Adar, 31. 7. Nisan, 30. 8. Aiyar, 31. 9. Haziram, 30. 10. Tamuz, 31. 11. Ab, 31. 12. Elul, 30.

YEAR, *Olympic*, was of a singular form, the first month commenced at the new moon, that the full moon might fall on the 15th day. Four years of 360 days contain 1440 days; 48 lunations are equal to 1417 days, 11 hours, 14 minutes; a 49th lunation added to the 4th year makes 1447 days, nearly. By this adjustment, the new moon would have happened on the 8th instead of the 1st of the month. To correct this error, two days were added to the last month of every year, the 4th excepted, when one day was added. By these means, the olympic year, which consisted of 362 or 361 days, must have varied 14 days from the course of the sun in the space of an olympiad; and, at the end of 50 years, the games would have been transferred to the winter solstice; but for preventing this deviation, a month was intercalated at certain intervals. Notwithstanding this, a considerable error still remained. The olympic games were regulated by the CYCLE of *Clostratus*; which see. See also OLYMPIAD and EPOCHA.

YEAR, *Persian*, is a solar year, of 365 days, consisting of 12 months of 30 days each, with five intercalary days added at the end.

The months are as follow: 1. Afrudia meh. 2. Ardihafest meh. 3. Cardi meh. 4. Thir meh. 5. Merded meh. 6. Schabarir meh. 7. Mehar meh. 8. Aben meh.

9. Adar meh. 10. Di meh. 11. Behen meh. 12. Assirer meh.

This year is called the *vezdegerdic* year, to distinguish it from the fixed solar year, called the *gelaean* year, which the Persians began to use in the year 1079, and which was formed by an intercalation made six or seven times in four years, and then once every fifth year.

The *vezdegerdic* year, it may be observed, is the same with Nabonassar's year, differing from it only in the names of the months, and the commencement of the epocha; for whereas the Nabonassarean began on February 26, this began on June 16. As to the *gelaean* year, it is absolutely the best and justest of all the civil years yet invented, as being found, by calculation, to keep the solstices and equinoxes precisely to the same days, and answering very accurately to the solar motions; which no other civil year does, not even the Gregorian, for want of so commodious an intercalation. See *Persian* CALENDAR.

YEAR, *Arabic*, *Mahometan*, and *Turkish*, called also the year of the *hegira*, (which see), is a lunar year, equal to 354 days, 8 hours, and 48 minutes, and consisting of 12 months, which contain alternately 30 and 29 days.

Though sometimes it contains 13 months; the names, &c. of which are as follow: 1. Muharram, containing 30 days. 2. Saphar, 29. 3. Rabia, 30. 4. Latter Rabia, 29. 5. Jomada, 30. 6. Latter Jomada, 29. 7. Rajab, 30. 8. Shaaban, 29. 9. Ramadan, 30. 10. Shawal, 29. 11. Dulkaadah, 30. 12. Dulheggia, 29; and in the embolismic year, 30. An intercalary day is added every 2d, 5th, 7th, 10th, 13th, 15th, 18th, 21st, 24th, 26th, 29th, in a cycle of 29 years.

The months commence not from the real new moon, but from its first appearance after conjunction.

YEAR, *Ethiopic*, is a solar year, perfectly agreeing with the *Actiac*, except in this, that the names of the month are different. It commences with the Egyptian year, on the 29th of August of the Julian year.

Its months are, 1. Mafcaram. 2. Tykympt. 3. Hydar. 4. Typhas. 5. Tyr. 6. Jacatil. 7. Magabit. 8. Mijazia. 9. Ginbat. 10. Syne. 11. Hamel. 12. Habafe. Intercalary days 5.

YEAR, *Atian*. See *ACTIAN* and *Egyptian* YEAR.

YEAR, *Atic*. See *Macedonian* YEAR.

YEAR, *Canicular*. See *CANICULAR*.

YEAR, *Yezdegerdic*. See *Persian* YEAR and *CALENDAR*.

YEAR, *Gelaean*. See *Persian* YEAR and *CALENDAR*.

YEAR, *Nabonassar's*. See *Egyptian* YEAR and *NABONASSAR*.

YEAR, *Sabbatic*, *Annus Sabbaticus*, among the ancients, was every seventh year; during which the Jews let their lands lie at rest. Levit. xxv. 8.

Every seventh sabbatic year, *i. e.* every 49th year, was called the *year of Jubilee* (which see); and held with solemnity extraordinary.

YEAR, *Anomalistical*. See *ANOMALISTICAL* and *YEAR supra*.

YEAR, *Climacteric*. See *CLIMACTERIC*.

YEAR, *Emergent*. See *EMERGENT*.

YEAR, *Enneatical*. See *ENNEACAL*.

YEAR, *Holy*. See *HOLY*.

YEAR, *Platonic*, or *Great*. See *PLATONIC*.

YEAR of the *Hegira*. See *HEGIRA*, and *Arabic* YEAR.

YEAR's *Day*, *New*, or the day on which the year commences, has always been very different in different nations; and yet in all has been held in great veneration.

Among the Romans, the first and last day of the year were

were consecrated to Janus; on which account it was that they represented him with two faces.

To them we owe the ceremony of wishing *an happy new year*, which appears to be very ancient. Before the first day was spent they not only visited and complimented each other, but also presented *fræne*, and offered vows to the gods for the preservation of each other.

Lucian represents it as a practice of a very ancient *Itand*-ing, even in his time, and refers it to Numa.

Ovid intimates the same ceremony in the beginning of his *Fasti* :

“ *Postera lux oritur, linguisque animique favete :
Nunc dicenda bono sunt bona verba die.*”

And Pliny more expressly, lib. xviii. cap. 1. “ *Primum anni incipientis diem lætis precatonibus invincem faustum ominantur.*”

In Russia at the new year is annually held a feast of the dead, called *Raditzli Sabol*, on occasion of which every body visits the grave of his relations, lays some victuals upon it, and then hears mass, in payment for which the priests get the victuals. In our own country, the ushering in of the new year, or “ *New Year’s tide*,” with rejoicings, presents, and good wishes, was a custom observed, during the 16th century, with great regularity and parade, and was as cordially celebrated in the court of the prince as in the cottage of the peasant. On the first day of the new year, presents, called new year’s gifts, were given and received with the mutual expression of good wishes, and particularly that of a “ *happy new year*.” The compliment was sometimes paid at each other’s doors in the form of a song; but more generally, especially in the north of England and in Scotland, the house was entered very early in the morning by some young men and maidens selected for the purpose, who presented the spiced bowl, and hailed you with the gratulations of the season. In the reign of queen Elizabeth, the chief officers of state, and several of the queen’s household servants, gave new year’s gifts to her majesty, consisting, in general, either of a sum of money, or jewels, trinkets, wearing-apparel, &c. The largest sum given by any of the temporal lords was 2*ol.*; but the archbishop of Canterbury gave 4*ol.*, the archbishop of York 3*ol.*, and the other spiritual lords 2*ol.* and 1*ol.* Many of the temporal lords and great officers, and most of the peeresses, gave rich gowns, petticoats, smocks, kirtles, silk stockings, cyprus garters, sweet-bags, doublets, mantles, some embroidered with pearls, garnets, &c., looking-glasses, fans, bracelets, caskets studded with precious stones, jewels ornamented with sparks of diamonds in various devices, and other costly trinkets. These presents also consisted of books, and appropriate gifts from physicians, apothecaries, &c. The queen, though she made returns in plate and other articles, took sufficient care that the balance should be in her own favour. In the country, however, with the exception of the extensive households of the nobility, this interchange was conducted on the pure basis of reciprocal kindness and good will, and without any view of securing patronage or support; it was, indeed, frequently the channel through which charity delighted to exercise her holy influence, and though originating in the heaven, then, became sanctified by the Christian virtues.

We shall here add, that the rejoicings on new year’s tide were succeeded by the observance of the “ *Twelfth-day*,” called, from the idea that the Eastern magi, who are said to have visited our Saviour on that day, were kings, the “ *Feast of the Three Kings*.” The “ *Twelfth-cake*,” distributed on that occasion, was almost always accompanied by the *wassail bowl*; which see. Drake’s *Shakspere*, vol. i.

YEAR, Civil, or Legal, in England, formerly commenced on the day of the Annunciation; *i. e.* on the 25th day of March: though the historical year began on the day of the Circumcision; *i. e.* the first of January, on which day the German and Italian year also begins.

Stowe observes, that William the Conqueror having been crowned on the first of January, that henceforth became the first of the year for historians, &c. though, in all civil affairs, they retained the ancient manner of accounting, which began the 25th of March.

The part of the year between these two terms was usually expressed both ways, as 1748-9, or 1748. But by the act for altering the style, the civil year now commences with January 1. See *NEW STYLE*.

Since the Conqueror, the king’s patents, charters, proclamations, &c. are usually dated by the year of the king’s reign.

The church, as to her solemn service, begins the year on the first Sunday in Advent, which is always that next St. Andrew’s day, or the 30th of November.

The Jews, as most other nations of the East, had a civil year, which commenced with the new moon in September; and an ecclesiastical year, which commenced from the new moon in March.

The month *Tifri*, which began about the time of the autumnal equinox, was the first month of the Jewish year, till it was changed at the time of the coming up of the children of Israel out of Egypt. For that happening in the month of Abib, afterwards called Nisan, this month was for this reason reckoned the first month of the year in all ecclesiastical matters. Before this period, *Tifri* was reckoned the commencement of the year, because it was thought that the world was created and first began at the time of the autumnal equinox. And for this reason, the Jews do still in their era of the creation of the world, as well as in their era of contracts, compute the beginning of the year from the first of *Tifri*, and all their bills and bonds, and all other civil acts and contracts, are still dated among them according to the same computation; and from this month also they began all their jubilees and sabbatical years. And therefore, although their ecclesiastical year began from Nisan, and all their festivals were computed from it, yet their civil year was still reckoned from *Tifri*, and the first day of that month was their new year’s day; and for the more solemn celebration of it, the feast of trumpets seems to have been appointed.

The French year, during the reigns of the Merovingian race, began on the day on which the troops were reviewed; which was the first day of March. Under the Carolingians it began on Christmas-day; and under the Capetians, on Easter-day; which, therefore, varied between the 22d of March and the 25th of April. The ecclesiastical year in France begins on the first Sunday in Advent. But for the civil, Charles IX. appointed, in 1564, that for the future it should commence on the 1st of January.

For an account of the change that took place in the year of France, see *French or Republican CALENDAR*. The French calendar was of no long duration. It was abolished in the course of thirteen years; and the Gregorian was restored, and ordered to be used in all dates after the 1st of January, 1806.

The Mahometans begin their year the minute in which the sun enters Aries. The Persians in the month answering to our June. The Chinese, and most of the Indians, begin it with the first moon in March. The Brachmans begin it with the first moon in April, on which day they hold a feast called *samewat saradi paduga*, *q. d. feast of New-year’s day*. The Mexicans, according to D’Acofta, begin the year on

our 23d of February, when the leaves begin to grow green : their year consists of eighteen months, having twenty days each, which make three hundred and sixty days; the remaining five days are spent in mirth, and no business is suffered to be done, nor even any service at the temples. Alvarez relates much the same of the Abyssinians; who begin their year on the 26th of August, and have five idle days at the end, which they call *pagomen*. At Rome there are two ways of computing the year; the one beginning at the Nativity of our Lord: this the notaries use, dating a *Nativitate*. The other on the 25th of March, on occasion of the Incarnation; and it is by this the bulls are dated, *anno Incarnationis*. The Greeks begin their year of the world from the first of September. See *YEAR supra*.

Years are also distinguished with regard to the epochs whence they are numbered: thus, *years of our Lord*, are those reckoned from the birth of Jesus Christ. *Years of the world*, are those elapsed since the Creation. *Years of Rome*, of the *Hegira*, of *Nabonassar*, &c. See the difference between these years, under the article *ΕΡΟΧΑ*.

YEAR is also a word used by some of the chemical writers to express any product of their operations, which may serve as a medicine, whether internally or externally.

YEAR and Day, in *Law*, &c. is a time that determines a right in many cases, and is in some an usufruct, and in others a prescription.

Thus, in the case of an estray, if the owner, proclamation being made, challenge it not within a year and day, it is forfeit. In like manner is the year and day given in cases of appeal, of descent, of entry or claim, of non-claim upon a fine, or writ of right, of the death of a man sore bruised, or wounded, of protections, effoins in respect of the king's service, of a wreck, and on many other occasions.

YEAR, Day, and Waste, Annus, Dies, et Vestium, is a part of the king's prerogative, by which he challenges the profits of the lands and tenements of persons attainted for petit treason, or felony, for the space of a year and a day, whoever is lord of the manor to which they belong.

Formerly the king had only a liberty of committing waste on the lands of felons, by pulling down their houses, extirpating their gardens, ploughing their meadows, and cutting down their woods. But this tending greatly to the prejudice of the public, it was agreed in the reign of Henry I. that the king should have the profits of the land for one year and a day in lieu of the destruction he was otherwise at liberty to commit: and, therefore, *Magna Charta* provides, that the king shall only hold such lands for a year and a day, and then restore them to the lord of the fee; without any mention made of waste. But the statute 17 Edward II. *de prerogativa regis*, seems to suppose, that the king shall have his year, day, and waste, and not the year and day instead of waste; which Sir Edward Coke, and the author of the *Mirror*, before him, very justly look upon as an encroachment, though a very ancient one, of the royal prerogative.

This year, day, and waste, are now usually compounded for; but otherwise they regularly belong to the crown: and, after their expiration, the land would naturally have descended to the heir (as in gavel-kind tenure it still does), did not its feudal quality intercept such descent, and give it by way of escheat to the lord. *Black. Com. book iv.*

YEAR-Books, in *Law*. See *REPORTS*.

YEARS, Estate for, in *Law*, is a contract for the possession of lands or tenements for some determinate period: and it happens when a man letteth them to another for the term of a certain number of years, agreed upon between the lessor and the lessee, and the lessee enters thereon.

If the lease be but for half a year, or a quarter, or any less time, this lessee is reputed as a lessee or tenant for years, and is so styled in some legal proceedings; a year being the shortest term which the law in this case takes notice of. An estate of this kind, even for a thousand years, is only a chattel, and reckoned part of the personal estate; and, therefore, a lease for years may be made to commence in *futuro*, though a lease for life cannot.

With regard to emblements, or profits of land sowed by tenant for years, there is this difference between him and tenant for life: that where the term of tenant for years depends upon a certainty, as if he holds from Midsummer for ten years, and in the last year sows a crop of corn, and if it is not ripe and cut before Midsummer, the end of his term, the landlord shall have it; for the tenant knew the expiration of his term, and therefore it was his own folly to sow what he never could reap the profits of. But where the lease for years depends upon an uncertainty; as, upon the death of the lessor, being himself only tenant for life, or being a husband seized in right of his wife; or if the term of years be determinable upon a life or lives: in all these cases, the estate for years not being certainly to expire at a time foreknown, but merely by the act of God, the tenant or his executors shall have the emblements in the same manner as a tenant for life, or his executors shall be intitled to it. But not so, if it determine by the act of the party himself; as if tenant for years does any thing that amounts to a forfeiture; in which case the emblements shall go to the lessor, and not to the lessee, who hath determined his estate by his own default. *Blackf. Com. vol. ii.*

YEARLINGS, in *Rural Economy*, a term applied to young neat cattle of the heifer kind in the second year. It is observed in the Gloucestershire Report on Agriculture, that until within these few years, it was there esteemed a bad practice to let them be put so early to the bull, but that now it is even thought that this method improves them as milkers; and that from the increased value of stock, it is advantageous to anticipate a year, as a heifer in calf, at two years old, will be worth nearly as much as it would be if kept three. See *LIVE-Stock*.

YEARN, in *Hunting*, signifies to bark, as beagles properly do, at their prey.

YEARNING, in *Rural Economy*, a term applied to runnet, used for curdling milk in some places. See *DAIRY-ING* and *RUNNET*.

YEAST, Yest, or *Barm*, the foam or flower of beer, or other liquor in fermentation.

The yeast of beer is used for a leaven or ferment in the making of bread: as serving to swell or puff it up very considerably in a little time, and to make it much lighter, softer, and more delicate. But when there is too much of it, it renders the bread bitter.

The use of yeast in bread is but of late standing among us: it is not above a century since the avarice of the bakers first introduced it; and then it was only done by stealth. Though Pliny witnesses it to have been used by the ancient Gauls.

The faculty of medicine of Paris, by a decree of the 24th of March, 1688, solemnly maintained it noxious to the health of the people; yet even that censure could not prevent its progress.

Common ale-yeast may be kept fresh and fit for use several months by the following method: Put a quantity of it into a close canvas bag, and gently squeeze out the moisture in a screw-press, till the remaining matter be as firm and stiff as clay.

In this state it may be close packed up in a tight cask, for securing

YEAST.

securing it from the air; and will keep fresh, sound, and fit for use for a long time.

This is a secret that might be of great use to the brewers and distillers here, who, though they employ very large quantities of yeast, seem to know no method of preserving it, or raising nurseries of it; for want of which they sustain a very considerable loss; whereas the brewers in Flanders make a very great advantage of supplying the malt-distillers of Holland with yeast, which is rendered lasting, and fit for carriage, by this easy expedient. Shaw's Lectures.

Mr. Henry has repeatedly prepared an artificial yeast, by impregnating flour and water with fixed air, with which he has made very good bread, without the assistance of any other ferment: and he proposes this method of procuring fresh fermented bread at sea.

The process is as follows: Boil flour and water together to the consistence of treacle; when the mixture is become cold, fill a small cask with it. This cask is to be filled up in the manner represented in *Plate XV. fig. 7. Pneumatics*, and described under *PLYMOUTH Water*, for the impregnation of water with fixed air; and the process is to be conducted in a similar way, except that the cask is to be agitated as often as the mixture rises to about two-thirds of the capacity of the funnel *k*; and after each agitation, which should continue during several minutes, the unabsorbed air is to be let out, by withdrawing the plug from the orifice *m*, till that part of the mixture which remained in the funnel has returned into the cask. The orifice at *f* should also be larger than is necessary in the other operations, on account of the superior viscosity of the mixture. When, after repeated agitation, the mixture which has ascended into the funnel does not subside into the cask, it may be supposed incapable of absorbing more air.

Pour the mixture, thus saturated, into one or more large bottles, or narrow-mouthed jars; cover it over loosely with paper, and upon that lay a slate or board with a weight to keep it steady. Place the vessel in a situation where the thermometer will stand from 70° to 80°, and stir up the mixture two or three times in twenty-four hours. In about two days, such a degree of fermentation will have taken place, as to give the mixture the appearance of yeast.

With the yeast in this state, and before it has acquired a thoroughly vinous smell, mix the quantity of flour intended for bread, in the proportion of six pounds of flour to a quart of the yeast, and a sufficient portion of warm water. Knead them well together in a proper vessel, and covering it with a cloth, let the dough stand for twelve hours, or till it appears to be sufficiently fermented, in the above-mentioned degree of warmth. It is then to be formed into loaves and baked.

Mr. Henry adds, that perhaps the yeast would be more perfect, if a decoction of malt were used instead of simple water.

When the operation is finished, the cask, in order to prevent its contracting a disagreeable taint, should be well washed. Henry's Account of a Method of preserving Water at Sea, &c. p. 26, 1781.

YEAST, Chemical Properties of. The nature of yeast has been briefly discussed under the head of **FERMENTATION**. Since that article was written, however, some additional experiments have been published on the subject, which deserve to be noticed here.

The active and essential principle of yeast, as observed under the article *Fermentation* above alluded to, appears to be a species of *gluten*. When yeast is kept for some time in cylindrical glass vessels, a white substance, not unlike curd, separates and swims upon the surface. If this substance be removed,

the yeast loses the property of exciting fermentation. This substance possesses many of the properties of gluten, though it differs from it in others. Its colour is much whiter. It has not the same elasticity, and its particles do not adhere with the same force. It dissolves more readily in acids. Dr. Thomson considers this as the real fermentative principle, and thinks it may be considered as gluten somewhat altered, and rendered much more capable of decomposition. He thinks also that it existed in the raw grain originally, but underwent considerable modifications by the malting process, and perhaps others during the fermentation of the beer from which it separated.

The same distinguished chemist states, in support of this opinion, the experiments of Fabroni and Thenard. Fabroni, by heating the juice of grapes, and passing it through a filter, separated an adhesive matter, which possessed the properties of gluten, and deprived of which the juice refused to ferment, though it fermented as well as usual when this principle was again added. Thenard likewise found in the juices of all the fruits he examined a substance similar to that described by Fabroni, and which, according to him, is absolutely the same with pure yeast. This substance is insipid, does not change vegetable blues, is insoluble in water, loses three-fourths of its weight when dried, and is decomposed like animal substances. When eight parts of it were distilled, they left 2.83 of charcoal, and yielded 1.61 of water, 1.81 of oil, and a quantity of ammonia, which, when saturated with muriatic acid, formed 1.46 of muriate of ammonia. The gas obtained weighed 0.33, and consisted of one-fifth of carbonic acid, and four-fifths of carburetted hydrogen, requiring $1\frac{1}{2}$ times its bulk of oxygen to consume it. Nitric acid, even when much diluted, converts it into a species of tallow. With potash it forms a soap, while ammonia is disengaged. When mixed with sugar and a sufficient quantity of water, fermentation takes place, carbonic acid is disengaged, and a vinous liquor formed. By this action, the ferment loses the whole of its azote, and becomes incapable of exciting fermentation when mixed with a new portion of sugar. In farther corroboration still of this opinion, Dr. Thomson adduces an experiment of Kirchoff, which he thinks throws considerable light on the nature of yeast. Barley-meal contains both gluten and starch. Pure starch infused in hot water is not converted into sugar; nor does gluten become saccharine matter when heated in the same manner. But if a mixture of pure dried pulverized wheat-gluten and potatoe-starch be infused in hot water, the starch is converted into sugar. During the process an acid is said to be evolved. The gluten is little changed in appearance or quantity, and may most of it be separated by filtration. What is singular, however, it is incapable of inducing the same change upon starch a second time.

The following are the constituents of yeast, according to Weistrub, as quoted by Dr. Thomson. From 15.360 parts he obtained,

Potash	-	-	-	13
Carbonic acid	-	-	-	15
Acetic acid	-	-	-	10
Malic acid	-	-	-	45
Lime	-	-	-	69
Alcohol	-	-	-	240
Extractive	-	-	-	120
Mucilage	-	-	-	240
Saccharine matter	-	-	-	315
Gluten	-	-	-	480
Water	-	-	-	13.595
				15.142

Besides some traces of phosphoric acid and filica. But it is evident, as Dr. Thomson observes, that all these ingredients are not essential, and he considers the gluten only as deserving that appellation.

Some of the French chemists have considered the principle of fermentation to reside in an imperfect species of sugar, which they have denominated the *sweet principle*, and which they state to exist in combination with real sugar in all fruits containing that principle. This *sweet principle* they suppose to differ from pure sugar, in being incapable of crystallizing. A familiar example of it we have in *treacle* or *molasses*, which, according to them, is the *sweet principle* of the sugar-cane. This doctrine, however, has not met with many adherents; for, as Dr. Macculloch observes, although chemistry has not hitherto discovered the means of separating the sugar from the *sweet principle*, the results of fermentation leave no doubt that the latter consists of sugar combined with the vegetable extractive matter, or gluten, as it is denominated by most chemists. Thus molasses consists of a certain portion of *real sugar*, in such a state of combination with a variety of substances, and the fermentative principle among the rest, that it cannot be made to crystallize or be otherwise obtained in a separate state. This is demonstrated by the well-known fact, that molasses may be made to undergo the fermentative process, and to yield alcohol, in precisely the same manner as a simple mixture of sugar and yeast. The *sweet principle* of molasses, therefore, must be in fact nothing else than sugar, unless we suppose two different substances capable, by the same means, of producing the same result, which is totally unprecedented in chemistry, besides being in itself extremely improbable.

Upon the whole then, in the present state of our knowledge, we are obliged to conclude that the essential principle of yeast, or the real fermentative principle, is either identical with gluten, or closely allied to it. Of its real nature, however, and *modus operandi*, we are totally ignorant, and shall probably long remain so.

The yeast of beer is that most generally employed, and is of the utmost importance in the manufacture of bread, and of fermented liquors from malt. If carefully dried and preserved from moisture, it retains its properties for a long time, and it is a pity this practice is not more generally resorted to, as fluid yeast in warm weather soon becomes acerbic and putrid, and not only loses its properties, but imparts a most disagreeable flavour to the bread, &c. with which it is mixed. Yeast may be readily dried by first separating its watery parts as much as possible, and afterwards exposing it in shallow vessels to the air, or to a gentle heat in a stove. In this way, it may be obtained in thin laminae, and requires only to be preserved in close vessels in a dry place, when it will be always ready for use, by diffusing it in a little warm water. A popular method of preserving yeast is by drying it upon bunches of twigs. See BREAD, BREWING, FERMENTATION, and WINE.

YEAST, Medicinal Properties of. Yeast has been highly extolled as an antiseptic remedy in diseases, when a putrid diathesis was supposed to prevail; as in low typhus fevers, gangrene, &c. A good method of exhibiting it is, to mix one or two table-spoonfuls of it with a quart of infusion of malt or mild porter, and to take a wine-glassful of this mixture frequently. Many practitioners also have spoken highly of the good effects of a fomenting poultice composed partly of yeast, when applied to foul and gangrenous ulcers. The good effects of this remedy, if in reality it possesses any, may probably be attributed to the carbonic acid gas generated by its agency. See FEVER.

YEATS, Mrs., in *Biography*, the celebrated tragic

actress, who, in conjunction with Mrs. Brooke, the novelist, a lady of considerable literary merit, undertook, in 1773, at all risks, the conduct and government of the opera, and all its dependencies; an enterprise for which they were but sparingly qualified. In the first place, Mrs. Yeats, though possessed of strong natural parts, and an inherent spirit of government, knew no language but English, was ignorant and indifferent about music, dancing, painting, machinery, and decorations. She and her husband had saved a considerable sum by their salaries and benefits at our national theatres, and in hopes of accumulation previous to retirement, they quitted employments for which they were extremely well fitted, and in which their success was certain, to govern a most froward family by deputation, at the extreme hazard of being ruined.

Mrs. Brooke, who had resided some time at Quebec, after its conquest, with her husband, the Rev. Dr. Brooke, chaplain to the army in that colony, indeed knew French, had a good taste in books, and wrote in a good style; but was ignorant of music, and totally unacquainted with all opera concerns. Yet it was during this female regency, that the best composers, the greatest singers, and the most capital and renowned dancers, were engaged: for during nine years, from 1773 to 1782, we had Sacchini, Truetta, and Anfosfi, to compose; Pacchierotti, Anfani, and the Gabrielli, to sing; and Madlle. Heynel, the Veltris, and Le Picq, to dance.

Mrs. Yeats did not enrich herself by her opera sovereignty; but she had the address to escape ruin. And Mrs. Brooke, who risked no property, lost no reputation by imprudence, or the want of talents in the persons she engaged.

YECATY, in *Geography*, a town of Hindoostan, in Myfore; 20 miles N. of Seringapatam.

YECORA, a town of New Mexico, in the province of Hiagu; 50 miles E. of Riochico.

YEDACOTTA, a town of Hindoostan, in Myfore; 15 miles N. of Dindigul.

YEDAPADY, a town of Hindoostan, in the Carnatic; 8 miles N. of Sankerdurgam.

YEDAPILLY, a town of Hindoostan, in Myfore; 2 miles N.W. of Vencatighery.

YEDDIMUNGALUM, a town of Hindoostan, in the Carnatic; 18 miles E. of Tanjore.

YEDKAST. See JEZDKAST.

YEGUE HOTUN, a town of Chinese Tartary; 418 miles E.N.E. of Peking. N. lat. 43°. E. long. 124° 19'.

YEHEENAGUR, a town of Hindoostan, in Lahore; 15 miles N.N.E. of Jallindar.

YEHUNGSCHAUL, a town of Hindoostan, in Lahore; 40 miles W.N.W. of Lahore.

YELASURAM, a town of Hindoostan, in Palnada; 20 miles S.W. of Timerycotta.

YELCHORE, a town of Hindoostan, in the circle of Guntoor; 3 miles N.E. of Innaconda.

YELCOUR, a town of Hindoostan, in the Carnatic; 15 miles N. of Chittoor.

YELDOOR, a town of Hindoostan, in Myfore; 12 miles N.E. of Colar.

YELFOLA, a town of Spain, in Galicia; 18 miles N. of Santiago.

YELION, a word used by some of the barbarous writers to express glass.

YELL ISLAND, in *Geography*, one of the Shetland islands, 20 miles long, and about 7 broad, but intersected by a number of bays, by the inhabitants called *Voes*, which afford good harbours. The principal part of the arable land is confined to the neighbourhood of the coast; the inland parts are mountainous,

tainous, and covered with peat moss: there is but little heath, but abundance of a rough sort of grafs called *lubbo*, which grows naturally, and affords tolerable pasture for sheep, horses, and black cattle. Though the crops raised are not sufficient for above eight months' consumption, yet the inhabitants, by the advantage of having plenty of fuel, and catching immense quantities of small fish, live comfortably, and as well as the generality of the peasants of Scotland. N. lat. 60° 56'. W. long. 1° 20'.

YELLAGOOD, a town of Hindoostan, in Golconda; 45 miles S.E. of Nacoul.

YELLAMOODY, a town of Hindoostan, in the province of Madura; 25 miles W. of Madura.

YELLANG, a town of Burmah; 14 miles S. of Mellene.

YELLOOR, a town of Hindoostan, in Baramaul; 6 miles N.N.W. of Namcul.

YELLOW, a bright colour, reflecting the most light of any after white. See COLOUR.

The word is formed from the Italian *giallo*, or the German *gel*, which signifies the fame; or from the Latin *galbanus*, bright, gay.

There are divers yellow substances that become white, upon wetting and drying them again several times in the sun: such as wax, linen cloth, &c. (See BLEACHING.) And the same bodies, if they be already white, and continue a long time in the air without being wetted, turn yellow.

Paper and ivory, applied near the fire, become successively yellow, red, and black. Silk, when turned yellow, is whitened again with the fumes of sulphur.

YELLOW, in *Dyeing*, is one of the five simple and mother colours. See COLOUR.

The only materials used by the calico-printers for the production of fine yellows are the quercitron-bark (see QUERCUS), and the *Weld*, or *Reseda Lutcola*, which see. In order to obtain calicoes of the finest yellow or more delicate lemon colour, it is necessary to dry the pieces in the open air, as the stow would not fail to injure such colours; stow-drying having a tendency to change a yellow into an orange. In the operation of dunging the mordants for these pale yellows, care should be taken that it be not done at a higher temperature than 96° or 100°, as such a high temperature would impair their beauty. But besides, by dunging at this low temperature, the dyeing may be completed at about 110°, which will give a much livelier colour than if a higher temperature had been employed. For all the different shades of reds and yellows, the mordant employed by calico-printers is the acetate of alumine; which is prepared by a mixture of the sulphate of alumine with acetate of lead, both in a state of solution; so that, on the theory of double decomposition, sulphate of lead is formed, which precipitates while the acetate of alumine remains in solution. Of late this article has been prepared from the pyroligneous acid, by means of lime and alum, in the following manner:—The pyroligneous acid is first passed through a still, to divert it of a portion of the tar which is always dissolved in it: it is then saturated with lime or whiting; and the acetate of lime thus formed is decomposed by a heated solution of sulphate of alumine. The result of this double decomposition is sulphate of lime, which precipitates, and acetate of alumine, which is drawn from the sediment of the calcareous sulphate, and preferred for use. Mr. Parkes cautions the manufacturer against the use of lime in the process for making acetate of alumine; and he says that the true mode of making it, though more expensive, is that recommended by Berthollet, which consists in decomposing sulphate of alu-

mine by means of saccharum faturni, or acetate of lead. Mr. Parkes mentions a method of producing yellows on calico, which, though not often practised, has nevertheless a very good effect. The process is as follows:—A strong decoction of bark, thickened with gum tragacanth, is to be mixed with a portion of very pure muriate of tin; and this, when printed with the usual management, will produce a colour of great brightness and durability. This mode possesses one very important advantage; viz. that if it should be necessary to pad a piece in diluted acetate of alumine to obtain a pale lemon ground, the yellow figures previously done by the above process will not give out any part of their colour to the second mordant; whereas, whenever a strong yellow has been produced in the common way, the pattern is very apt to spread, and to become irregular, and often to stain the ground, when the piece comes a second time into the acetate of alumine. Parkes's Ess. vol. ii.

Turmeric likewise gives a good yellow; though not the best.

Woolen cloth, impregnated with a solution of alum and tartar, acquires on being boiled with the watery decoction, an elegant, but not very durable orange-yellow or gold-coloured dye. It is rarely made use of by the dyers, on account of its price, and the perishableness of its colour.

There is also an Indian wood that gives a yellow colour bordering on gold. This wood, called *fustick*, is a species of mulberry-tree, of a deep sulphur-yellow colour, which it readily gives out both to water and spirit. The watery decoction dyes prepared woollen of a very durable orange-yellow: the colour is imbibed by the cloth in a moderate warmth, without boiling.

The *fusset* or *fussel* of the French is a yellow wood or root, very different from our fustick: it gives a fine orange dye to woollen, but the colour is extremely perishable in the air. This is called *coinus coriaria*, or *Venice sumach*.

The leaves of many kinds of herbs and trees give a yellow dye to wool or woollen cloth that has been previously boiled with a solution of alum and tartar. There is, indeed, no colour for which we have such plenty of materials as for yellow.

Mr. Hellot observes, in his Art de Teindre, that all leaves, barks, and roots, which on being chewed discover a slight astringency, as the leaves of the almond, peach, and pear trees, ash-bark (especially that taken off after the first rising of the sap in spring), the roots of wild patience, &c. (see LEAF), yield durable yellows, more or less beautiful, according to the length of time that the boiling is continued, and the proportions of alum and tartar in the preparatory liquor: that a large quantity of alum makes these yellows approach to the elegant yellow of weld; that if the tartar is made to prevail, it inclines them to an orange; and that if the roots, barks, or leaves, be too long boiled, the yellow proves tarnished, and acquires shades of brown. Neumann's Chemical Works, by Lewis, p. 384. 434.

The Chinese are famous for their yellows in dyeing, which never change with washing. They make this dye of the flowers of the acacia, in a manner in which we might use several of our productions to a great advantage.

It is thus: they gather the flowers before they are perfectly ripe, and dry them in an earthen vessel over a gentle heat, till they crisp up in the manner of tea-leaves: they then add to them the ripe seeds of the same tree in different proportions; and then boiling them in river water, with alum, they give the yellow in any degree that they please.

They have three kinds of yellow, which they distinguish by the names of *Ngo-boang*, *king-boang*, and *hoang* alone.

The first of these is the brightest yellow: to dye five or

fix ells of silk of this colour, they use a pound of the flowers of the acacia, about two ounces of the seeds, and four ounces of alum.

The *king-hoang* is a somewhat deeper yellow: to dye this, they use the same ingredients in the same proportion as in the former case; and when the silk is dry from the dipping in this, they give it a second dipping in a slight tincture of Brazil wood: this brings it to the fine strong yellow we see.

The *hoang*, or pale yellow, is made of the same ingredients as the first, only instead of four ounces of alum they put in but three ounces: river water is found to be greatly preferable to any other for the extracting of these colours; but even in that there is great difference, some doing the business much better than others.

The Chinese are so expert in judging on this occasion, that they can tell by the taste of water whether it will or will not do; and if it taste faint they know it is faulty; but they dip the pieces twice into it instead of once, and the colour succeeds well.

The flowers of the acacia, when they have been prepared by roasting in this manner, may be kept all the year round, and employed in dyeing as occasion requires, only there is to be longer boiling for the dried flowers than the fresh ones; and it is always found that the fresh flowers give the brightest colour. Obs. sur les Coutum. de l'Asie, p. 254.

Greens are usually made of water and blue mixed. With yellow, madder red, and goat's-hair prepared with madder, are made the golden yellow, Aurora, pansy, nacarate, Isabella, and chamois colour, which are all casts or shades of yellow.

Mr. Peter Woulfe has given the following receipt for making the yellow dye:—Take half an ounce of powdered indigo, and mix it in a high glass vessel, with two ounces of strong spirit of nitre, which should be previously diluted with eight ounces of water, for preventing the indigo's being set on fire by the spirit; because two ounces and a half of strong spirit of nitre will set fire to half an ounce of indigo: let the mixture stand for a week, and then digest it in a sand-bath for an hour or more, and add four ounces more of water to it; filter the solution, which will be of a fine yellow colour. If the indigo be digested twenty-four hours after the spirit of nitre is poured upon it, it will froth and boil over; but after standing about a week, it has not that property.

One part of the solution of indigo in the acid of nitre, mixed with four or five parts of water, will dye silk or cloth of the palest yellow colour, or of any shade to the deepest, and that by letting them boil more or less in the colour. The addition of alum is useful, as it makes the colour more lasting: according as the solution boils away, more water must be added. None of the colour in the operation separates from the water, but what adheres to the silk or cloth; and consequently this colour goes far in dyeing.

Cochineal, Dutch litmus, orchil, cudbear, and many other colouring substances treated in this manner, will all dye silk and wool of a yellow colour.

The indigo which remains undissolved in making Saxon blue, and collected by filtration, if digested with spirit of nitre, dyes silk and wool of all shades of brown, inclining to a yellow.

Cloth and silk may be dyed green with indigo; but they must first be boiled in the yellow dye, and then in the blue. Phil. Transf. vol. lxi. part. i. p. 129, &c. See DYEING.

Painters and enamellers make their yellow of masticot, or, as some write it, masticot, which is ceruse raised to a yellow colour by the fire; or with yellow ochre. Limners

and illuminers make it with saffron, French berries, orca-nette, &c.

Mr. Boyle tells us a most beautiful yellow may be procured by taking good quicksilver, and three or four times its weight of oil of vitriol, drawing off, in a glass retort, the saline menstruum from the metalline liquor, till there remains a dry snow-white calx at the bottom: on pouring a large quantity of fair water on this, the colour changes to an excellent light yellow.

He says he fears this colour is too costly to be used by painters, and he does not know how it would agree with every pigment, especially oil colours. Works abr. vol. ii. p. 91. See VITRIOL.

Branton observes, that it was anciently the custom to paint a man's door yellow, and threw his house with salt, to declare him a traitor to his king.

YELLOW and other Colouring Matters of Flowers, in *Rural Economy*, the different colouring matters thus produced. The nature of the colouring matters of flowers has not yet been much examined into. Such colouring matters are in general very transient, especially those of the blue and red kinds. The yellow colouring matters of this sort are said to be the most permanent. It is noticed by a late writer, that the carthamus contains a red and a yellow colouring matter; that the yellow is easily dissolved by water; that from the red, rouge is prepared by a process which is kept secret; that the colours of most flowers are changed by alkalis to green, and by acids to red; that an imitation of the colouring matter may be made by digesting solutions of gall-nuts with chalk; a green fluid is produced, which becomes red by the action of an acid; and that has its green colour restored by means of alkalis.

YELLOW Copper, in *Mineralogy*, copper pyrites. See COPPER ORES.

YELLOW Earth, a soft yellow mineral substance, found at Wehraw, in Upper Lusatia, associated with clay and argillaceous iron-stone: it is sometimes used as a yellow pigment. The characters given of this substance do not seem to entitle it to be regarded as a different species from some of the ochreous clays which occur in the coal-strata in England. It is classed by professor Jameson with the lithomarge family, and is thus described by him. Its colour is ochre-yellow, of different degrees of intensity; it occurs massive; it is dull in the cross fracture, but glimmering in the principal fracture. In the large, the fracture inclines to flaty; in the small, the fracture is earthy. The fragments are tubular, or indeterminate angular. It becomes shining in the streak; it is opaque and very soft, passing into friable; it soils the fingers slightly, and adheres to the tongue; its feel is rather greasy; it is rather light, but the specific gravity is not given. Before the blow-pipe, yellow earth is converted into a black and shining enamel. We have no analysis of this earth.

YELLOW Tellurium Ore, an ore of tellurium, hitherto found only at Nagygy, in Transylvania. See TELLURIUM.

YELLOW Cow-Wheat, in *Agriculture*. See WEED.

YELLOW Dead Nettle. See WEED.

YELLOW Devil's Bit. See WEED.

YELLOW or French Berries. See AVIGNON, and LYCIUM.

YELLOW Fever, an epidemic disease of frequent occurrence in America and the West Indies. See FEVER, *Yellow*.

Vessels arriving in Great Britain or Ireland, or the islands of Guernsey, Jersey, Alderney, Sark, or Man, from places where the yellow fever is known to exist, or where it is deemed likely to break out, are subjected by various laws and orders of his majesty in council to the restraint of quarantine; the same as ships arriving from countries subjected

to the *Plague*, for the details of which, see that article in the *Addenda*.

YELLOW-Hammer, in *Ornithology*, the name of a very common English bird, called by authors *emberiza lutea*; and by Linnæus *emberiza citrinella*; and by some *hortulanus*; by others *luteus*; and by others *chloræus*.

The bill is of a dusky hue; the crown of the head is of a pleafant pale yellow; in some almost plain, in others spotted with brown; the hind-part of the neck is tinged with green; the chin and throat are yellow; the breast is marked with an orange-red; the belly yellow; the lesser coverts of the wings are green; the others dusky, edged with rufst colour; the back of the fame colours; the rump of a rufly red; the quill-feathers dusky, edged on their exterior fides with yellowifh-green; the tail is a little forked; the middle feathers are brown; the two middlemoft edged on both fides with green, the others on their exterior fides only; the interior fides of the two outmolt feathers are marked obliquely near their ends with white.

This fpecies makes a large flat nest on the ground, near a bush or hedge, of mofs, dried roots, and horfe-hair; it lays fix eggs, of a white colour, with dark purple veins; and in winter frequents our farm-yards with other small birds. Pennant.

There is befide this another kind, which is much smaller, and of a browner colour on the back; this is called by fome authors *zivalo*.

YELLOW Hawk-weed, in *Agriculture*. See WEED.

YELLOW Jaundice, in *Medicine*. See JAUNDICE.

YELLOW, King's, is a pure orpiment, or arsenic coloured with fulphur, ufed for painting in oil and varnish; of an extreme bright colour, and when good a true yellow: when ufed alone, it will stand well; but mixed with white lead, and feveral other pigments, its colour lies or changes. It is fometimes mixed with blue pigments, to form a green colour. This pigment may be prepared by mixing fulphur and arsenic by fublimation: taking of arsenic powdered, and flowers of fulphur, in the proportion of twenty parts of the first to one of the fecond, and putting them into a sublimer, and fubliming them in a fand-heat by means of a furnace particularly adapted to the purpose. When the operation is completed, the king's yellow will be found in the upper part of the glass, which must be feparated with care from any foul parts adhering to it in the glass, and levigated into an uniform powder. It may be also obtained from common orpiment by fubliming it in the fame manner. This pigment may be rendered warmer, or more inclined to orange, by increafing the proportion of the fulphur, and vice versa. Handmaid to the Arts, vol. i. p. 17.

YELLOW Ladies' Bed Straw. See WEED.

YELLOW Meat, in *Rural Economy*, that which is much tinged with a yellow colour. It is faid to be a peculiar property in fome forts of animals, of both the fheep and cattle kinds, to afford meat which has a yellow cast or appearance.

It is fuffeged that this defect must be hereditary, as no pasture or particular food can either produce or remove it, as fheep which have been tried in the manner here described and found yellow have been sent to the Thames marshes, kept there a year, and when slaughtered have proved as yellow as gold. It may probably depend upon fome physiological principle, which mere examination after death has not yet shewn. These remarks are equally applicable to beef as mutton, and are the result of information on the fubject derived from a well-experienced Smithfield falefman.

YELLOW, Naples. See GIALLOLINO.

YELLOW Oat-Grass, in *Agriculture*, a fort of grass which thrives well in meadows and pastures, as well as upon hills where the foil is of a calcareous nature, flowering in the middle of summer. It is a rather coarse grass, which, though tolerably sweet, is thought by many to be much inferior to the meadow and fescue grasses; and which Withering has asserted not to be relished by cattle; but which Swayne thinks one of the best grasses of this kind for the ufe of the farmer.

The proportional value which the grass, at the time the feed is ripe, bears to that at the time of flowering, is as 9 to 15.

The proportional value which the grass of the latter-math bears to that at the time of flowering, is as 5 to 15; and to that at the time the feed is ripe, as 5 to 9.

It is remarked, that this fpecies of grass is pretty generally cultivated in many districts and parts of this country; and that it would appear from the above details to be a valuable grass, though inferior to many others. See AVENA *Flavescens*, GRASS, and GRASS-LAND.

YELLOW Ochre. See OCHRE.

YELLOW Rattle. See WEED.

YELLOW Scour or Milk, a difeafe in lambs, which takes place while they are young, and in which they appear quite dull and spiritless; their ears instead of being upright lie flat and afunder on their heads; they are very lank in the fides and bellies, and their breathing is very short and unequal. These appearances are fucceeded by a purging of a yellowifh milky coloured matter, which, in fome cafes, has come on before the difeafe is noticed; but at other times, the lambs die without having had any or only a flight difcharge of excrement. The body or carcase appears well fed; the excrement in the intestines, which last are fometimes in fome degree fwelled, refembles in colour that passed at the anus, while the ftomach is particularly full of coagulated milk.

It is a difeafe which never appears or shews itself in hard seasons, but only when the weather is warm, growing, and genial, and there is great plenty of new grass. In general it does not affect them after they are three weeks old. It is mostly afcribed to their sucking more milk than they can digest; and it is even faid, that they not unfrequently fuck until their ftomachs burft.

The lambs being young, and of little value, remedies to prevent or remove the difeafe are feldom tried; but thofe of the aromatic cretaceous kind, with a little opium, may often be ufed with much advantage in preventing and curing the complaint.

YELLOW Vetchling, in *Agriculture*, a plant of the rare kind, that may be cultivated by the farmer in many cafes with profit. The writer of the *Essays on Rural Affairs* states, that it grows with great luxuriance on stiff clayey foils; that it continues annually, for any length of time, to afford a great weight of produce, which is of the very best quality; that it is equally fit for pasture herbage or for hay, and that it may be applied to one or other of these purposes at any period as convenient; that it has likewise this advantage, that as it continues to grow with equal strength in the end as in the beginning of the summer season, it may admit of being pastured upon in the early spring, when necessary, without endangering the loss of the hay-crop, which cannot be the cafe with any other plant usually cultivated, except clover, which is unfit both for early pasture and for hay; and that it is still more valuable, as growing to the greatest perfection on such foils as are wholly unfit for producing *sain-foin*, the only fort of plant yet cultivated in the

the field, which seems to have qualities approaching to those of this plant.

The principal objection to its cultivation is the difficulty of procuring the seeds of it in plenty, which may probably be obviated by proper management. It is, however, an abiding plant, and one which increases fast by its running roots, and which may readily be propagated in this way in the field. See *LATHYRUS Pratensis*.

YELLOW-Berry Wash, is a solution of the gum of the French berries in water; and may be prepared by boiling a pound of the berries in a gallon of water with half an ounce of alum, in a pewter vessel, and filtering the fluid; and by evaporating the fluid in the boiler till the colour appears to be of the requisite degree of strength.

This is used as a washing colour in water-painting: it will stand extremely well, and being more diluted, or laid on thicker, will, in consequence of its transparency, give a variety of shades.

YELLOW Wash of Saffron. See *Tincture of SAFFRON*.

YELLOW Wash of Turmeric. See *TURMERIC*.

YELLOW Breeches Creek, in *Geography*, a river of Pennsylvania, which runs into the Susquehanna, N. lat. 40° 13'. W. long. 76° 52'.

YELLOW Creek, a township of Ohio, in the county of Columbiana, with 491 inhabitants.—Also, a river of America, which runs into the Ohio, N. lat. 40° 34'. W. long. 80° 44'.

YELLOW River, a small river of Ireland, in the King's county, which joins the river Boyne.

YELLOW River. (See *HOANG*.) Mr. Barrow, supposing, without the possibility of exaggeration, that the breadth of the Yellow river, where Macartney's embassy passed it, about 70 miles from the sea, was only three-fourths of a mile, the mean depth five feet, and the velocity of its course four miles an hour, concludes, from these data, that the river discharges into the Yellow sea, in every hour, a volume of water equal to 418,176,000 solid feet, or 2,563,000,000 gallons of water, or 1100 times as much as appears to be furnished by the Ganges. By another computation, he estimates the quantity of mud washed into the sea by this river in every hour to be equal to 2,000,000 solid feet, or 48,000,000 in every day, or 17,520,000,000 in every year. Supposing the mean depth of the Yellow sea to be 20 fathoms, or 120 feet, the quantity of earth brought down by the Yellow river would, if accumulated together, be sufficient to fill up, even to the surface of the sea, an island one mile square in 70 days. By extending the calculation, a curious inquirer may find in what space of time the Yellow sea itself might be filled up by the successive depositions from the Yellow river alone; for supposing that sea to extend northward from that river, and to include the gulfs of Pe-che-lee and Leao-tong, the number of square miles on the surface of this extent would be about 125,000, which, multiplied by the number (70) of days necessary for consolidating one mile square, would make 8,750,000 days, or 24,000 years.

The velocity of the Yellow river at the place where the embassy crossed it was so great, as to require, agreeably to the superstitious notions of the Chinese crews, a sacrifice to the spirit of the river, in order to ensure a safe passage over it. With this view, the master presented a cock, and having wrung off his head, which he threw into the sea, consecrated the vessel with the blood spouting from the body, by sprinkling it upon the deck, the masts, the anchor, and the doors of the apartments, and stuck upon them a few of the feathers of the bird. Various kinds of provisions were then ranged across the deck; and when the

captain had made three profound inclinations of the body: with his hands uplifted, he muttered a few words, as if of solicitation to the Deity. The loo, or brazen drum, was in the mean time beaten forcibly; lighted matches were held towards heaven; papers, covered with tin or silver-leaf, were burnt; and crackers fired off in great abundance by the crew. The captain afterwards made libations to the river, by emptying into it from the vessel's prow the several cups of liquids which he had provided, and concluded with throwing in also that which held the falt. All the ceremonies being finished, and the bowls of meat removed, the people seated on it; and afterwards launched with confidence the yacht into the current. As soon as she had reached the opposite shore, the captain returned thanks to heaven, with three inclinations of the body. Sacrifices are also offered to obtain a fair wind, and to avert any impending danger.

Besides these offerings, great exertions were necessary to overcome the violence of the Yellow river, and to transport large yachts in safety to the opposite shore. Embassy to China, vol. ii.

YELLOW Sea, an extensive but shallow inland sea between Corea and China, hardly any where exceeding forty-five fathoms in depth, and often not more than twenty; with a bottom of clay or mud: the alluvion, without doubt, of the rivers that are poured into it from the mountains and plains of China. See *LEAO-TONG*.

YELLOW S, in *Animals*, is a disease which is incident to horses, neat-cattle, and sheep, in which there is a yellow jaundice-like appearance, especially in the eyes.

It is a disease that takes place in horses in all states of them, but which in those of the young kind is often unaccompanied with fever, or any sort of irritation.

It shews itself by a particular yellowness in the eyes and the inside of the mouth, with a considerable degree of constipation of the bowels in some cases.

The complaint is frequently much relieved by the use of a ball composed of one ounce of aloes in powder, with one drachm of calomel, and half an ounce of Castile soap, made up with a sufficient quantity of treacle; and the second morning afterwards giving one constituted of half an ounce each of nitre, resin, and Castile soap, made up with honey; and if the yellowness should continue in the eyes and mouth, repeating the latter after an interval of four days.

Some, however, advise to have first recourse to bleeding, clysters, and purges; in the last of which intentions the composition directed below may be found useful: One ounce and a half of Indian rhubarb, two drachms of saffron, and six drachms of foccotrine aloes, formed into a ball with syrup of buckthorn. But if the rhubarb should be thought too expensive, it may be omitted, and the same quantity of cream of tartar, and half an ounce of Castile soap, with four drachms more of aloes, be added. This may be repeated two or three times, giving intermediately the remedies directed below: Half an ounce of Æthiops' mineral, and one ounce of Castile soap, formed into a ball, and one of them given every day, washing it down with a pint of the following decoction: Madder and turmeric-root, each four ounces; burdock-root sliced, half a pound; monk's rhubarb, four ounces; and liquorice sliced, two ounces; boiled in one gallon of forge-water to three quarts; the liquor then strained off, and sweetened with honey.

In this disease, balls of Castile soap and turmeric alone are likewise often had recourse to, even to the quantity of three or four ounces or more in the day; and not unfrequently succeed in recent cases.

By means of this sort, the disease for the most part abates

abates in the course of a week or ten days, which may be known by the alteration in the eyes and mouth of the horse; but the remedies are to be continued until the yellowness is wholly removed. Should, however, the disease prove obstinate, and not give way to such modes of treatment, it will be necessary to have recourse to more powerful remedies, such as those of the mercurial purging kind, repeated two or three times at proper intervals, and then to give the balls composed of the substances directed below: Two ounces of salt of tartar, four ounces of cinabar or antimony, three ounces of filings of steel, and soap half a pound, formed with honey into balls the size of a pullet's egg, giving one night and morning in a pint of the above decoction drink.

On the recovery of the horse, some advise two or three mild purges; and if he be strong and fat, to put in a rowel.

He should have mashes and warm water frequently, and be exercised daily, and warmly covered with cloths.

In order to prevent a relapse, the first purging-ball may sometimes be used with great advantage; and a powder formed of the following ingredients be mixed, with the feeds of corn every night for a fortnight: Æthiops mineral, nitre, and aniseeds, each half an ounce, mixed together.

Salt-mashes, too, have often been found very useful in the cure of this disorder, and when taken in time rarely fail in restoring the animal.

The yellows in neat-cattle is a common disease, arising from obstruction in the gall-ducts, and consists in a diffusion of the obstructed bile through the whole body of the animal. It is first distinguished in the white of the eyes, which has a particular yellow appearance; and as it increases, the whole of the skin becomes tinged with the same yellow colour: but the ears, tail, eyes, and mouth, are the parts in which it is the most conspicuous. The animals are affected with great weakness and debility in every stage of the disease, and there is a littleness, with indisposition to move, and a want of appetite for their food. When in the pastures, they mostly wander about by the sides of the hedges, or other fences, in a lonely manner. Milch cows are particularly subject to the disease in the spring and at the fall of the year; though they are not exempt from having it at all other seasons. The most unfavourable state of the disease is when it proceeds from an induration of some part of the liver, as there is then but little hope of the disease being permanently removed. As the changing state of the weather has often a great effect in retarding or hastening the removal of the disease, care should be taken to house the animals in all unfavourable seasons.

On the first appearance of the disease, it may often be removed by the composition directed below: Salt of tartar, Castile soap, and grains of Paradise, each one ounce; turmeric-root, and coriander-seeds, in powder, each two ounces; the whole being made into a drink, by pouring three pints of hot ale upon the ingredients in a proper close vessel, first slicing the soap in a thin manner, and covering them well up until they become about new milk warm, when two ounces of honey or treacle may be added, and the whole given as a drink. It must be repeated at the distance of every day or two, for two or three times, or as there may be occasion.

Where the beast is strong, a little blood may sometimes be taken away with advantage; but it should not be turned out into the pasture the same day.

When the disease does not give way to these remedies, it may be necessary to have recourse to a strong purge or two. After which a drink composed as below may be given: Salt of tartar, one ounce; Castile soap sliced, two ounces;

well rubbed down with an ounce of balsam of copaiva, and then two ounces each of valerian-root, ginger-root, and Peruvian bark in powder added, and the whole given in ale or gruel as above, repeating it every other day.

It is necessary to keep the bodies of the animals well open through the whole of the disease; in which intention a drink composed as below may often be useful: Barbadoes aloes, in powder, one ounce; castor-oil, four ounces; syrup of buckthorn, two ounces; mixed and given in a quart of oatmeal-gruel when about new milk warm, and repeated until the proper effect be produced, using the first saponaceous drink at the same time.

When this complaint is removed, the general health of the animals may soon be restored by the proper use of cordial strengthening drinks, formed of the different aromatic pectoral seeds in the powdered state.

The yellows is not a very common disease among sheep, and consequently has not been very accurately described; but probably confounded with many other affections to which they are subject. It is supposed by some to be in general confined to the South-Down and new Leicester breeds, which, from their more tender constitutions, are more liable to complaints.

The appearances of the disease are a yellowness over the whole body, but particularly distinguishable in the white of the eye. The wool, too, has a little of the tinge, and is slightly hard. The passages of the belly are of a whitish colour, and the urine is found to tinge any thing immersed in it of a yellow hue. Sometimes there is a degree of fullness and hardness in the right-side, about the seat of the liver. The causes are any thing which has a tendency to obstruct the gall-ducts, but they are by no means evident; their effect, however, seems generally to harden the liver, and invariably to impede the passage of the bile from it into the bowels. In some cases, small stones, formed in the gall-bladder, produce it; and at other times, it is caused, as in the rot, by the swelling of the glands impeding the flow of the bile in the ducts, in which case it is mostly incurable.

The removal of the disease is to be attempted by the use of strong purgatives, and such remedies as act strongly on the stomach. A strong solution of purging salts will partly tend to produce this effect; and ten grains of ipecacuanha, given every three hours in a little warmed strong beer, is said to be attended with the most beneficial effects, when continued for five or six days together, and a dose of purging salts given after it, so as to clear the bowels. Calomel and soap may likewise be often given with great benefit, as well as some of the above saponaceous remedies.

YEMANA, or JEMAMA, in *Geography*, a country and city of Arabia, which M. D'Anville, probably misled by some map and uncertain accounts, places on a river called Altan, and which he represents as a stream in Nejed, though Niebuhr mentions it merely as a wadi or brook, which runs after rains. D'Anville says, that Jemama is in Al Kardjé, which is the grand province of Kerjé of Niebuhr, on the E. of Hedjaz and Yemen; and in this province, according to the Danish geographer, is the city of Amamé or Imamé, renowned for the prophet Moseilama, whom the historian Gibbon ascribes to Yemama, and which town is in the district of Surfa. But this cannot correspond with D'Anville's Jemama, which is in the province of Ared, bounded only by that of Lahfa on the E. Niebuhr also informs us, that Ajjana, a town of Ared, is remarkable for the new prophet Wabbab; and therefore Gibbon seems to have erred by supposing it to be the same with Yemama, the latter being probably a town of Kerjé, not far to the E. of Hedjaz. After all, the province and city of Jemama

are probably mere fictions, which should be excluded from the maps, together with the river of Altan, which, if it existed, would certainly be followed by the caravans from Lahfa to Mecca, while they seem to prefer a sandy desert. Pinkerton's Geography.

YEMBA. See EMBA.

YEMELLA, a town of Hindooistan, in Golconda; 24 miles E.N.E. of Rachore.

YEMEN, a province of Arabia, comprehending the finest and most fertile part of Arabia, representing, as Gibbon has observed, the Arabia Felix of antiquity, surrounded by the Red sea, or Arabic gulf, and by the province of Hadramaut, Nedsjed, and Hedsjas. Yemen is naturally divided into two parts, differing greatly in soil and climate: that bordering on the Red sea is a dry and sandy plain, nearly two days' journey in breadth, and is scorched by the most torrid heats; the other, extending immediately beyond this, is a high-lying country, full of precipitous yet fertile hills, and enjoying a much more temperate air. Yemen is, like the rest of Arabia, parcelled out among a number of different sovereigns in unequal portions. Some of them are princes of considerable power; but many are petty schieks, who are, however, perfectly independent: the most considerable of these princes is the imam, who resides at Sana. There are several other independent states, as Aden, Kaukeban, Kobail or Hafchid-u-Bekil, Abu-Arifch, a large district between Abu-Arifch and Hedsjas, inhabited by free Bedouins; Khaulan, Sahan, comprehending the principality of Saade; Nedsjeran, Kachtan, Nehhm, East Khaufan, Dsjof or Mareb, Jafa, and several others. The same intermixture of fertile and barren territory, and the same productions, appear every where through the whole province: the imam, however, seems to be master of the richest, the most agreeable, and the most interesting part of this tract of country. It would not be easy to explain distinctly the extents and limits of this sovereign's territories, as they are so inter-fected by the domains of a number of petty princes. The general division of Yemen into Tehama the Lowlands, and Djebal the Highlands, obtains in the imam's dominion as well as elsewhere. Upon this grand division depends the subdivision of the kingdom of Sana into thirty governments or counties. Tehama contains six of these governments, and the Highland country twenty-four: the small governments are not all alike populous or remarkable. There are in the territory of the imam many schieks dispersed among the mountains, who acknowledge not his authority, and are but in a very slight degree dependent upon him. From the expulsion of the Turks in the year 1630, the reign of the imams began; their great ancestor Khallem Abu Mahomed was the chief author of that revolution. The throne of Yemen is hereditary; if generally approved of by the subjects, the eldest legitimate son of an imam is his rightful successor. But in the despotic governments of the East, indeed, no order can be closely observed, because there are no fundamental laws. The imam is an absolute prince, and the more so by uniting in his own person supreme authority, both spiritual and temporal, over his subjects. His jurisdiction in ecclesiastical matters, however, extends not over the dominions of other sovereigns of the same sect: these states have each a mufti, or cadi, for its spiritual use. Although the imam be absolute, he is checked in the exercise of his authority by the supreme tribunal of Sana, of which he is only president: this tribunal, consisting of a certain number of cadis, possesses the sole power of life and death. The imam may not order any of his subjects for execution, but such as have been condemned in consequence of a criminal prosecution before this court.

The cadis are generally esteemed to be persons of incorruptible integrity, of blameless lives, and devoted to the faithful discharge of their duties: they are not changed here so often as in Turkey, but hold their offices usually for life. Every petty district in the dominions of the imam has its governor: if not a prince, or one of the higher nobility, this governor is called wali and dola, or sometimes emir, when he happens to be a person of low birth. In every little town, a sub-dola, with a small garrison, consisting sometimes of five or six foldiers, resides to maintain order. The chief of a large village is a schiek; he of a small one a hakin. Every city in which a dola resides has also a cadi, dependent on the chief cadi of Sana; the cadi is sole judge in civil and ecclesiastical affairs, nor may the dola interfere to contradict his sentences, or render them inefficacious. The cadis in the provinces, no less than in the capital, are in high reputation for wisdom and integrity. The revenue of the imam is fluctuating and precarious; Niebuhr states it at about 500,000 crowns a month. This revenue arises from a land and poll tax, and from duties payable upon articles of merchandize. The military force consists ordinarily of 4000 infantry and 1000 cavalry. These armies use no artillery, nor do the Arabs know how to manage cannon. As the imam has no dread of enemies or corsairs upon the Arabic gulf, he has no occasion for a naval force; and his subjects are therefore generally unskilled in navigation. The fishermen venture far to sea in small canoes scarcely furnished with oars. The manufactures of a people of so little industry cannot but be very trifling: no sabres are manufactured in Yemen, nor any edged weapon, except a kind of crooked knives, called *jembea*. The making of match fire-locks has been attempted here within these few years: it succeeds but indifferently. It is only of late that glass works have been established at Mocha; some coarse cloth is manufactured here, but not so much as is required for the use of the country: broad cloths are neither made nor worn here. The English brought some goods of this sort to Mocha, but were obliged to carry them back to India unfold. A country which affords so few articles for sale cannot have a great trade. Coffee is almost the sole article exported from Yemen; a valuable commodity, in exchange for which many of those things which this country needs from abroad may well be obtained. All the commerce of Yemen is carried on by Mocha, except only that some small quantities of coffee are exported by Loheia and Hodeida. Agriculture seems to be farther advanced in Yemen than in the other parts of the East. Wheat, in the best cultivated districts, is said to yield an increase of fifty-fold; durra, in the Highlands, 140; and in the Tehama from 200 to 400: and the inhabitants of Tehama reap three successive crops from the same field in the same year. In many parts of Yemen, whole fields are cultivated like a garden, and watered in the rainy season by canals from the hills. The inhabitants of the plain are obliged to encamp their fields with dykes, that the water may remain for some time upon the surface of the ground. In the upper parts of Yemen, the inhabitants collect the water necessary for their fields in dams formed at the foot of the hills. In some districts of Yemen, maize and durra are planted with the hand. The husbandry of Tull and Du Hamel, says Niebuhr, although novel in Europe, is very old in Arabia. In order to guard their fields from depredation of birds and other destructive animals, the peasants watch them by turns. In the Highlands, he who watches seats himself on a tree; in the Tehama, on a sort of scaffold, with a roof raised over it. Niebuhr's Travels.

YEN, a river of China, which runs into the Hoang, 17 miles S.E. of Yen-tchang.

YEN-CHIN-TCHING, a town of China, in Chantong; 45 miles E.S.E. of Tci-nan.

YENDON, a river of England, in the county of Stafford, which runs into the Churnet.

YENGHI IMAN, a town of Curdistan; 70 miles S.E. of Kerkuk.

YENGI, a town of Corea; 25 miles N.E. of Kang.

YENISSEI, or YENISSEY, or *Eniffi*, a river of Russia, which the Tartars and Mongoles, who inhabit the superior regions of it, above the Tunguska, call Kem, and the Ostiaks, Gub or Kheses, signifying the Great river, and which is at first composed of two rivers, the Kamfara and the Veikem, originating in the Chinese Soongaria, or Bucharia, and forming a conjunction in N. lat. 51° 30', and E. long. 111°. About the mouth of the Bom-Kemthyug it enters on Russian ground, and hence first takes the name of Yenissey. After various windings it turns northward, and in N. lat. 70', and E. long. 103° 30', forms a bay containing several islands; and at last, in 3° 30' of length, falls into the Frozen ocean. In autumn, when its water is at the lowest, its breadth, *e. gr.* at the town of Yenisseisk, is about 570 fathom, whereas in the spring it is 795 fathom and upwards. The coasts of the Frozen ocean, between the mouths of the Yenissey and Oby, are called the Yuratzkoi shore. The more considerable streams taken up by the Yenissey are the following: on the right, the Ufs, the Tuban, the Kan, and the three Tunguskis, *i. e.* the Upper, the Middle, or Podkammenaia, and the Lower Tunguska; on the left, the Abakan, the Yelovi, and the Turukhan. In its superior regions, the Yenissey flows over a very stony bed; and its shores, particularly the eastern, are mostly beset with lofty mountains and rocks. Its course is in general very rapid, though near its mouth it flows so gently, that the current is hardly perceptible. In the neighbourhood of Turukansk and elsewhere it forms some considerable islands; and between the cities of Yenisseisk and Krasnoyarsk several cataracts are to be seen. The Yenissey is navigable from its mouth as far as Abakan, and affords abundance of the best fish. Near this river, as well as in some other steppes of Russia, are stone-tombs, which represent in rude sculpture human faces, camels, horsemen with lances, and other objects. Between this river and the Oby, or Ob, is a vast space extending from the north of Tomsk to the Arctic ocean, which is regarded as a steppe, being a prodigious level with no appearance of a mountain, and scarcely of a hill. The same term is applied to the wider space between the Yenissey and the Lena, between the Arctic ocean in the N., and the river Tunguska, or Angara, in lat. 63°; and to the parts beyond the Lena as far as the river Kolyma or Covima. Tooke's Russ. vol. i.

YENISSEISK, or ENISSEISK, a small town of Russia, in the government of Tobolsk, situated on the above described river, the forges of which yield a considerable tax to the Russian revenue. Its jurisdiction is extensive, and it pays annually a tribute in skins to the crown of Russia; 400 miles E.N.E. of Kolivan. N. lat. 58° 16'. E. long. 91° 50'.

YENITE, in *Mineralogy*, *Lieovrite*, Werner, a mineral found in the island of Corfica, which from the great quantity of iron that it contains might properly be classed with the ores of iron. It is arranged by professor Jameson with the chrysolite family, but it differs greatly in the proportions of its constituent parts from all the other species which he has classed with this family. The appearance of this mineral resembles hornblende, or rather black epidote:

it occurs both crystallized and massive. The form of the crystals is that of a rhomboidal prism, the alternate angles of which measure about 113 and 67 degrees: the prisms are terminated by low four-sided pyramids, the faces of which are set on the lateral planes of the prism. It is also crystallized in rectangular prisms, bevelled on the extremities, and the bevelling planes set on the obtuse edges. These figures are also variously modified by the edges or angles being bevelled. The crystals are sometimes very minute or acicular, and sometimes half an inch in thickness; they are frequently aggregated in diverging radii, and sometimes imbedded. The prisms are striated longitudinally. The structure is imperfectly lamellar, with joints parallel to the sides, and to the short diagonal of the rhomboidal prism. The fracture of yenite is uneven, and imperfectly conchoidal, with a lustre between vitreous and resinous. The colour is black passing into brown; it does not change its colour in the streak. The hardness of yenite is about equal to that of common feldspar; it is easily frangible. The specific gravity of yenite varies from 3.825 to 4.061.

It is fusible with ease by the blow-pipe into a black glass, which has a metallic aspect, and is attracted by the magnet, but does not possess polarity; it dissolves with borax with a slight ebullition. It is acted upon by the mineral acids, but does not gelatinize with them. When exposed to heat it becomes magnetic. Its colour is changed by heat from black into dark reddish-brown, and it loses about two per cent. of its weight.

The constituent parts of yenite are,

Silex	-	from	-	28	to	30
Alumine	-	-	-	1	-	1
Lime	-	-	-	12	-	14
Oxyd of iron	-	-	-	51	-	58
with manganese	}	-	-			

Yenite decomposes gradually on exposure to the air, and is reduced to a yellowish-brown ochre. According to Brongniart, yenite occurs in dispersed crystals and groups, and in compact kidney-shaped masses, in a thick bed of a greenish substance nearly resembling yenite, but which has not been accurately examined. It is accompanied with epidote, quartz, and arsenical pyrites. This bed at Rio la Marino, in Corfica, covers a rock of primitive marble mixed with talc. At the Cap de Calamite, it is accompanied with magnetic iron-stone, garnets, and quartz.

YEN-KING, in *Geography*, a city of China, of the second rank, in Pe-tche-li; 52 miles N.N.W. of Peking. N. lat. 40° 30'. E. long. 125° 30'.

YENLADE, or STRAY, a channel between the Thames and Medway, which separates the island of Grain from the coast of Kent. It was formerly the usual passage for vessels to and from London.

YENNE, a town of France, in the department of Mont Blanc, near the Rhône, supposed to be the ancient Epanna, where Sigismund, king of Burgundy, assembled a council at the end of the fifth century; 14 miles N.W. of Chambery.

YEN-NGAN, a city of China, of the first rank, in Chen-li, on the river Yen; 390 miles S.W. of Peking. N. lat. 36° 44'. E. long. 108° 49'.

YEN-PING, a city of China, of the first rank, in Fokien; 820 miles S. of Peking. N. lat. 26° 40'. E. long. 117° 54'.

YEN-TCHEOU, a city of China, of the first rank, in Tche-kiang. Near this town are mines of copper, and trees that yield varnish, which give a value to the cabinet-work so much esteemed in Europe; when this varnish is once dry, it never melts again, and will bear boiling water.

The paper manufacture of this place is in equal esteem, and for which they have a great demand. Six towns of the third order are under its jurisdiction; 650 miles S.S.E. of Peking. N. lat. 29° 38'. E. long. 119° 14'.—Also, a city of China, of the first rank, in Chan-tong. The territory depending upon this capital is inclosed between two considerable rivers, which abound with fish, and make the soil very fruitful. The country is very well cultivated, the mountains are covered with woods, and the air is mild and temperate. There are twenty-seven towns within the jurisdiction of this capital; four of the second order, and twenty-three of the third; 267 miles S. of Peking. N. lat. 35° 44'. E. long. 116° 36'.

YENTCHERU, a town of Hindoostan, in the circar of Cuddapa; 20 miles N.N.E. of Comban.

YEN-TCHING, a town of China, in Chan-tong, where a peculiar species of glass is manufactured, of so delicate a nature, that it will not endure the inclemency of the air; 45 miles S.E. of Tei-nan.

YEO. See YEovil.

YEOMAN, the first or highest degree among the plebeians of England; next in order to the gentry.

The yeomen are properly the freeholders, who have land of their own; and so called from the Saxon *gemane*, or *geman*, common.

The word *youngman* is used for yeoman in the statute 33 Hen. VIII., and in old deeds it is sometimes also written *jeoman*, which, in the German, signifies *any-body*.

According to Sir Thomas Smith, a yeoman is a free-born Englishman, who can lay out of his own free land in yearly revenue to the sum of forty shillings sterling.

The yeomanry of England are capable of holding lands of their own to a good value; are adjudged capable of certain offices, as constables, churchwardens, jurymen; and are also to vote in elections to parliament, and to serve in the army, and to do any other act where the law requires one that is *probus et legalis homo*.

The yeomen were famous, in ancient times, for military valour, being particularly expert at the management of the bow; whence the infantry was composed chiefly of them.

They frequently constituted the body-guard of our kings; and in process of time gave rise to the institution of *yeomen of the guard*.

In many cases, the law conceives a better opinion of the yeomanry that occupy lands, than of tradesmen, artificers, &c.

By a statute, 2 Hen. IV., it is enacted, that no yeoman shall take or wear a livery of any lord, upon pain of imprisonment, and a fine at the king's pleasure.

YEOMAN is also a title of office in the king's household, of a middle place or rank between a gentleman and a groom. Such are the yeoman of the buttery; yeoman of the scullery; yeoman of the wine-cellar, ewry, wood-yard, &c. There are also the yeoman of the mouth, yeoman of the kitchen, yeomen-porters, &c.

YEOMAN, in *Sea Language*, an officer under the boat-swain or gunner of a ship of war, usually charged with the stowage, account, and distribution of their respective stores.

YEOMEN-Warders. See WARDERS of the Tower.

YEOMEN of the Guard, properly called *yeomen of the guard of the king's body*, were anciently a body of men of the best rank under gentry, and of larger stature than ordinary; every one being required to be six feet high.

Their number has varied in almost every reign, and formerly consisted of a certain number in ordinary, and an

indefinite number extraordinary; and in case of a vacancy in the former, it was supplied out of the latter number.

In the reign of king Edward VI. this corps was very numerous. In the reign of queen Elizabeth, the yeomen attending her in her different progresses were occasionally mounted. In the reign of queen Anne, the arms of half this band were arquebuses, which are said by Chamberlain to have been disused ever since the reign of king William; the other half had partisans, and those of both classes had swords. They had their wages and diet allowed them; so that in a MS. of the expences of the royal establishment for the year 1727, the charges of the table of the yeomen of the guard were 273*l.* 15*s.* But their diet has been discontinued since that reign. Their duty was to wait upon the queen in her standing-houses; forty by day, and twenty by night. At St. James's, they waited in the first room above stairs, called the guard-chamber. It is also their duty to attend the foreveign abroad by land or water.

At present there are but one hundred yeomen in constant duty, at 39*l.* 11*s.* 3*d.* per annum each; eight of whom are called *ufhers*, who have 10*l.* per annum each more than the other yeomen; six are called *yeomen hangers*, and two, *yeomen bed-goers*, who have the same pay as the *ufhers*; and seventy more not on duty; and as one of the hundred dies, his place is supplied out of the seventy.

The officers are, a captain, who has 1000*l.* per annum; a lieutenant, at 500*l.* per annum; an ensign, at 300*l.*; and four exons, at 150*l.* per annum each; and a clerk of the checque at the same salary.

Their origin is traced to the year 1485, when king Henry VII. ascending the throne, immediately after his coronation, instituted a guard of fifty archers to attend him and his successors. They were probably then, as they are now, called the *yeomen of the guard*.

It is observed, that this is the first instance of any established or permanent military guard in England; its kings, till that time, except in times of war and infurrection, contenting themselves with the guard of their proper domestics and retinue. And. Hist. Com. vol. i. p. 302.

Most of the writers, however, against standing armies commence that establishment with the sergeants at arms, who were first instituted by king Richard I. Their dress is that which was worn in the reign of king Henry VIII., and which on many occasions was put on by that king; it consists of a scarlet coat reaching down to the knees, guarded with garter blue velvet, and with badges of the rose and crown on their breasts and backs; their breeches also are scarlet, guarded with blue velvet; their caps are of black velvet, with broad round crowns, adorned with ribbands of the royal colours, viz. red, white, and blue.

The officers and yeomen are at the disposal of the captain; but the captain is at the appointment of the king.

YEOMAN of the Salt Stores. See ACATERY.

YEOMANRY CAVALRY, a denomination given to those troops of horse which were levied in the late war among the gentlemen and yeomen of the country, upon the same principle with the volunteer companies. The yeomanry cavalry were to be allowed pay when called out on actual service, and each corps was liable to be put upon duty within its district: all contingent expences, properly and unavoidably incurred, were to be reimbursed after an investigation at the war-office. One sergeant and a trumpeter per troop were to have constant pay, with the same allowances as sergeants and trumpeters of regular cavalry. Some accoutrements were to be furnished by the ordnance, or an equivalent

equivalent in money to be given in lieu of them, and 14*s.* 2*d.* per man for hollers.

YEOVIL, in *Geography*, a large and populous market-town in the hundred of Stone, county of Somerset, England, is situated on the confines of the county, at the distance of 9 miles S.S.E. from Somerton, and 122 miles W.S.W. from London. It derives its name from the river Yeou, which rises near Sherborne, and passes this place under a stone bridge of three arches, separating the counties of Somerset and Dorset. The town of Yeovil consists of upwards of twenty streets and lanes; many of the former are of considerable width: the houses in general are respectable, and many of them are built of stone. Part of the town is called the Borough, and is governed by a portreeve and eleven burgesses, out of whom the portreeve is annually chosen. Here is a spacious market-house, seventy feet in length, and twenty in breadth, supported by stone pillars, in the centre of which are the remains of an ancient cross. A considerable market is held on Fridays for corn, cattle, pigs, butter, cheese, and flax: here are also two annual fairs. The woollen trade was formerly extensive here, but has decreased: the chief business of the town is the manufacture of leather gloves. In the return of the year 1811, the population of this parish was estimated at 4118; the number of houses at 459. The church, a large ancient structure, consists of a nave, chancel, two aisles, and transept: the length of the whole is 146 feet; the breadth 50. At the west end is a plain tower, ninety feet high, with a stone balustrade at the top. Dissenters have several meeting-houses in the town. Here is an alms-house, founded in the year 1476, by the Rev. Mr. Woburne, minor canon of St. Paul's, London, and by him endowed with considerable landed property for the maintenance of a master, two wardens, and twelve poor persons of either sex. He also built a chapel for the use of his poor, and ordained divine service to be performed in it every day.—Collinson's History of Somersetshire, vol. iii. Beauties of England and Wales, vol. xiii. Somersetshire.

YEOUNGBENZAH, a town of Birmah, on the Irawaddy; 36 miles N.N.W. of Rangoon. N. lat. 17° 30'.

YEOU-TUN-OUEI, a town of Chinese Tartary. N. lat. 41° 8'. E. long. 121° 9'.

YEOU-YU, one of the small islands in the Chinese Archipelago; 62 miles S.W. of Macao.

YEOWAH, a town of Birmah; 15 miles S. of Pegongmew.

YEPES, a town of Spain, in New Castile; 17 miles E. of Toledo.

YERAPATTA, a town of Hindoostan, in Myfore; 8 miles S. of Dalmacherry.

YERCO, a town of Thibet; 90 miles S.E. of Lassa.

YERE, a river of France, in the department of the Lower Seine, which runs into the English Channel, at Eu.

YERGHIEN. See **YARKAN**.

YERK, in *Horser*, a term signifying to strike out backwards. A horse is said to yerke, or strike with the hind legs, when he flings and kicks with his whole hind quarters, striking out the two hinder legs near together, and even to their full extent. Horses of this sort are very dangerous, and should be parted with as soon as possible, whether they are of the farm or the saddle kind.

YERKIE, in *Geography*, a town of Russia, on an island at the mouth of the Volga, where vessels take their departure for the Caspian sea. Here ships formerly entered and cleared, but the island is now almost overflowed, and the

trade of the place much decayed since 1747; 60 miles S. of Aftrachan.

YERMA. See **JERMAH**.

YERMUK. See **YARMUC**.

YERTNAGOODAM, a town of Hindoostan, in the circar of Rajamundry; 17 miles S.W. of Rajamundry.

YERVA-MORA, in *Botany*. See **BOSEA**.

YERVILLE, in *Geography*, a town of France, in the department of the Lower Seine; 12 miles N.N.E. of Caudebec.

YESCOKING CREEK, a river of North Carolina, which runs into Pamlico sound, N. lat. 35° 29'. W. long. 76° 14'.

YESD. See **YEZD**.

Yesb, a town of Persia, in the province of Laristan; 40 miles N. of Lar.

YESDECAST. See **JEZDKAST**.

YESID, a town of Persia, in the province of Chufistan, or Kuzistan; 18 miles N. of Toliar.

YEST. See **YEAST**.

YETCHERADAW, in *Geography*, a town of Hindoostan, in Myfore; 9 miles E. of Rydroog.

YETEOPAUK, a town of Hindoostan, in the circar of Cicacole; 15 miles S.W. of Coffimcotta.

YETHAN, a river of Scotland, which runs into the German sea, 10 miles N. of Aberdeen.

YETHOLM, or **ZET-HAM**, a market-town in the district of Kello, and shire of Roxburgh, Scotland, is situated nine miles S.E. from Kello, on the small river Bowmont, which divides it into two parts, respectively named Town Yetholm and Kirk Yetholm. A weekly market is held on Wednesdays; and two fairs annually. Many tinkers and gypsies reside in this town. The parish extends about four miles in length, and two in breadth; and is bounded on the east and south by the English border. The surface is hilly, but the hills are covered with verdure, and pastured by a very considerable number of sheep. In the population return of the year 1811, this parish is stated to contain 213 houses, and 1138 inhabitants. King Robert III. granted the barony of Yetholm in the fourteenth century to Archibald Mac Dougal, whose descendant still enjoys it.—Carlisle's Topographical Dictionary of Scotland, 1813.

YETTUS, in *Natural History*, a name given by the writers of the middle ages to a species of marble of a deep red, which was used by some as a touch-stone.

YEU, in *Geography*, a small and insignificant isle, situated on the W. coast of France.

YEVA CHARRUM, in *Natural History*, a name given by the people of the East Indies to a kind of litharge, which is very common in that part of the world, and is said to be made partly from lead and partly from zinc.

It is less heavy than our yellow litharge, and of a paler colour. It is used as a caustic in all the occasions of surgery there.

YEVERING, in *Geography*, a village of England, in the county of Northumberland, where the Scots were defeated in 1415, by Sir Robert Humphreil and the earl of Westmoreland. Near it is a mountain called Yevering Bell, belonging to those called Cheviot; 6 miles W.N.W. of Wooller.

YEULA, a town of Hindoostan, in Baglana; 5 miles E. of Bahbelgong.

YEVRE LE CHATEAU, a town of France, in the department of the Loiret; 6 miles S.E. of Pithiviers.

YEW, or **EUGH**, in *Botany*. (See **TAXUS**.) De Theis traces these English words, whose antiquity cannot be

doubted, to the Celtic *If* or *Iaw*, green, alluding to the evergreen foliage of this tree. The French have retained *If* unaltered to the present day.

Yew, as some say, may be derived from the Greek *ἰστύω*, *to hurt*; and probably because before the invention of guns our ancestors made their bows of this wood: they therefore took care to plant the trees in the church-yards, where they might be often seen and preserved by the people.

Yew is also a term used by the salt-workers of Lymington, and some other parts of England, to express the first rising of a scum upon the brine in boiling.

In the places where they use this term, they add no clarifying mixtures to the brine, for it ferments in the cisterns, and all its foulness sinks to the bottom in form of a thin mud; they admit only the clear liquor into the pan, and boil this briskly till it yews, that is, till a thin skin of salt appears upon its surface; they then damp the fire, and carefully skim off this film, and clear only the scum or calcareous earth, which separates to the bottom.

They do not collect this into scum-pans, as at many of the other works, but they rake it up to one side of the pan, and take it out; they there add a piece of butter, and continue the fire moderately strong till the salt is granulated. They keep a brisker fire on this occasion at Lymington than in most of the other works; so that they will work three pans in twenty-four hours. See *SALT*.

Yew-Tree, in *Agriculture and Rural Economy*, a well-known evergreen tree, the timber of which is much esteemed for different uses and purposes in husbandry, and where toughness, elasticity, and durability, are required.

Trees of this sort may be easily propagated, in most cases, by sowing their berries when divested of the pulp in autumn, as soon as they are ripe, upon a bed of fresh undunged soil, either over the whole or in drills, covering them over about half an inch thick with the same earth: but the latter is the better mode. In the spring, the bed must be carefully cleared from weeds, and if the season prove dry, it will be proper to refresh it with water now and then, which will promote the growth of the seeds; many of which will come up the same spring, but others will remain in the ground until autumn or spring following; but when the seeds are preserved above ground till spring before they are sown, the plants never come up till the year after, so that by sowing the seeds as soon as they are ripe there is often a whole year saved.

The plants, when they come up, should be kept constantly well cleared from weeds, which, if permitted to grow amongst them, would cause their bottoms to be naked, and frequently destroy the plants when they continue long undisturbed.

In this bed, the plants may remain two years; after which, in autumn, there should be a spot of fresh undunged soil prepared, into which they should be removed about the beginning of October, planting them in beds about four or five feet wide, in rows about a foot asunder, and six inches distant from each other in the rows, observing to lay a little litter or mulch upon the surface of the ground about their roots, as also to water them in dry weather until they have taken root; after which they will require no farther care, but to keep them clear from weeds in summer, and to train them according to the purpose for which they are designed, — for timber in a straight manner.

In these beds they may remain two or three years, according as they have grown, when they should again be removed into a nursery, placing them in rows at three feet distance, and the plants eighteen inches asunder in the rows,

observing to do it in the autumn, as before directed, and continue to trim them in the summer for what they are intended; after they have continued three or four years in this nursery, they may be transplanted where they are to remain, always observing to remove them in autumn where the ground is very dry; but on cold moist land it is better in the spring.

These trees are very slow in growing, but there are many very large trees upon some barren cold soils.

It is observed in the Gloucestershire Report on Agriculture, that the yew-tree should not be suffered to grow in or near cow-pastures. The leaves are poisonous to horned cattle and horses, though the berries are esteemed inoffensive. In January 1805, in consequence of some fences being broken down by a violent wind during the night, a number of cows belonging to a farmer in Sandhurst entered an inclosed shrubbery, where there were many yew-trees growing, and continued in it till the morning. Soon after they were driven out, all of them were seized more or less with a kind of madness, or such acute pains as made them run about in a very furious manner, sometimes leaping to a considerable height, then beating their heads against whatever opposed them, and at last falling instantly dead. Oils of different sorts were poured down their throats, as there was an opportunity of securing them, which seemed to produce a good effect on some; but notwithstanding every effort, nine out of thirty died in a few hours after they were discovered. On their being opened, it appeared that the whole quantity they had eaten, put together, would not have filled a peck.

An opinion prevails, that the leaves are not poisonous in the summer: this, however, is probably erroneous, at least it is not confirmed sufficiently by fact to justify the farmer in subjecting his cattle to the experiment. If cattle come within reach of the yew-tree at that time of the year, they may perhaps reject it altogether, giving the preference to other green food, more palatable, and in plenty around them.

These trees should therefore in all cases be carefully kept out of the hedge-rows and all other parts of fields, where cattle are suffered to feed and pasture.

YEYEAPOUR, in *Geography*, a town of Hindoostan, in Lahore; 16 miles S. of Nagorcote.

YEZD, or *YESD*, a large and populous city of Persia, situated in a sandy desert, contiguous to a high range of mountains running nearly E. and W. This is the grand mart between Hindoostan, Bucharia, and Persia, and is, therefore, a place of considerable trade. The bazaar is well supplied, and the city contains 20,000 houses; besides those of the Guebres, or worshippers of fire, which are estimated at 4000. The Guebres were an industrious people, but are greatly oppressed, being taxed at twenty piastres a-head, in addition to the various other exactions of the Persian government. Many opulent Hindoos formerly resided here; but the late governor, wishing to enrich himself by plundering their property, they all fled in one night towards Candahar, where they have since established themselves. The present khan has, in vain, endeavoured to recall them, and there are now only nine Hindoos in Yezd. The city imports the greatest part of its corn from the neighbourhood of Ispahan. Cattle are also scarce, and an ass will sometimes sell as high as fifty tomanis. The manufacture of silk stuffs is superior to any in Persia; and the numuds or thick felts of Tuft, a small village, distant eight miles, are equally famous. The sort of Yezd has but a mean appearance; and the town is destitute of a wall.

That

That territory which lies between Yezd and Ispahan is the most arid part of Irak. The soil is poor, light, and sandy; and here is a general scarcity of wood and water: the climate also is hot, though not unhealthy. The small towns of Arditan, Nain, Aujdah, Mynboot, and Sezdabad, are badly built, and contain from 100 to 200 houses each. M'Kinneir's Persia.

YEZDEGERDIC YEAR, in *Chronology*. See **PERSIAN Year**.

YEZDICAN, in *Geography*, a river of the Persian empire, in the province of Azerbaijan, which has its source about 60 miles to the E. of the lake of Van, and which, pursuing a N.E. course, passes under the walls of Yezdican and Kurs, and meets the Araxes a little to the N. of Nuchshivan.

YEZEDI, the name of a Persian sect, of which several tribes inhabit the mountains of Sinjar, about eight or ten miles from Nisibis. They are numerous in the vicinity of Mosul, and are said to worship, or rather deprecate, the devil, entertaining an idea that he possesses an unlimited power over mankind. They even dislike to hear the name of the evil spirit mentioned in their presence. They are the descendants of those Arabs who followed the banners of Yezid, and fought against Houssain, in the battle of Kerbela; and scheik Ade, the founder of the sect, is interred near Mosul. They adore one Supreme Being as the creator and benefactor of the human race, drink wine and other strong liquors, and circumcise like the Mahometans. The Yezedi are hated by the Turks, to whom they are mortal enemies, and who have never been able to subdue them. They lie in ambush behind the rising grounds which skirt the road between Mosul and Merdin; and as travellers are obliged to pass a lonely wild, twenty furlongs in length, they are liable, if not numerously attended, to be murdered by these miscreants. Sinjar affords abundance of pasture, and also yields a sufficient quantity of grain for the consumption of its savage inhabitants. M'Kinneir's Persia.

YFFINIAC, a town of France, in the department of the North Coasts; 6 miles S.E. of St. Briec.

YGEA, a town of Spain, in Old Castile; 12 miles S. of Calahorra.

YGGEDE, or **UGGADE**, in *Ancient Geography*, a place of Gallia Lyonnensis. Anton. Itin.

YGIN, in *Geography*, a town of Corea; 28 miles S.S.W. of Haimen.

YGROMETER. See **HYGROMETER**.

YGUALADA, in *Geography*, a town of Spain, in Catalonia; 28 miles N.W. of Barcelona.

YGUISAN, a small island among the Philippines, near the north coast of Panay. N. lat. $11^{\circ} 35'$. E. long. $122^{\circ} 32'$.

Y-HO, a river of China, which rises in Chan-tong, and runs into the Hoang, near Sou-tcheou, in the province of Kiang-nan.

YIAN-CHAN, a town of Corea; 28 miles E. of Hetfin, or Etfin.

YICHKENISH, one of the smaller Western islands of Scotland; 1 mile N. of Benbecula.

YIELD or *Slack the Hand*, in the *Manage*. See **SLACK**.

YIELDING and *Paying*, a law phrase, formed by corruption from the Saxon *geldan*, or *gildan*, to pay. Hence, in Domesday, *gildare* is frequently used for *solvere*, *reddere*; the Saxon *g* being easily converted into a *y*. See **GELD**, and **GILD**.

YIETI, in *Geography*, a town of South America, in the province of Paraguay; 120 miles S.E. of Assumption.

YIN, a word used by some of the chemical writers to express verdigrise.

YISSER, in *Geography*, a river of Algiers, anciently called Serbetis, which runs into the sea at Jinnett.

YKINA, a town of Sweden, in the province of Finland; 45 miles N. of Biornborg.

YLANE, a town of Sweden, in the government of Abo; 27 miles N. of Abo.

YLAG. See **ILA**.

YLAGAN, a town on the north coast of Mindanao.

YLIKANNUS, a town of Sweden, in the government of Wafa; 24 miles E.N.E. of Gamla Karleby.

Y-LIN, a city of China, of the second rank, in Houquang; 617 miles S.S.W. of Peking. N. lat. $30^{\circ} 52'$. E. long. $110^{\circ} 44'$.

YLISTARO, a town of Sweden, in the government of Wafa; 24 miles E.N.E. of Wafa.

YLIVIESKA, a town of Sweden, in the government of Ulea; 38 miles S. of Ulea.

YLO, or **ILO**, a sea-port town of Peru, in the diocese of Arequipa, situated near the mouth of a fresh-water river of the same name, which is dry from the beginning of October to January; 25 miles W. of Moquegna. S. lat. $17^{\circ} 38'$.

YLIST. See **ILEST**.

YLUO OE, a small island of Denmark, in the Little Belt. N. lat. $55^{\circ} 8'$. E. long. $10^{\circ} 7'$.

YLWISKA, a town of Sweden, in East Bothnia; 28 miles S. of Brahestad.

YNATILAN, a town on the west coast of the island of Sibiu. N. lat. $10^{\circ} 21'$. E. long. $123^{\circ} 22'$.

YNCA, **YNCAN**, or **INCA**, an appellation anciently given to the kings of Peru, and the princes of their blood; the word signifying literally, *lord, king, emperor, and royal blood*.

The king himself was particularly called *capac ynca*, i. e. great lord; his wife, *pallas*; and the princes simply *yncas*. These yncas, before the arrival of the Spaniards, were exceeding powerful. Their people revered them to excess, as believing them to be sons of the sun, and never to have committed any fault. If any person offended the royal majesty in the smallest matter, the city he belonged to was totally demolished.

When they travelled, whatever chamber they lay in on the road was walled up as soon as they departed, that nobody might ever enter in after them. The like was done to the room in which the king died; in which, likewise, all the gold, silver, and precious furniture, were always immured, and a new apartment was built for his successor.

His beloved wives, domestics, &c. likewise sacrificed themselves, and were buried alive in the same tomb along with him. See the History of the Yncas, by Garcilasso de la Vésia. See also **INCA**.

YNG, or **YN**, in *Geography*, a city of China, of the second rank, in Chan-fi. N. lat. $39^{\circ} 40'$. E. long. $112^{\circ} 49'$.

YNIESTA, a town of Spain, in New Castile; 20 miles S.E. of Alarcón.

YNING, a town of Corea; 33 miles E.N.E. of Tintcheou.

YN-PING, a town of Corea; 38 miles S.W. of Koangtcheou.

YN-TCHENG, a town of Corea; 25 miles E. of Ouchtchen.

YN-YUEI,

YN-YUEL, a city of China, of the second rank, in Yun-nan; 1300 miles S.W. of Peking. N. lat. 25° 58'. E. long. 98° 24'.

YOAK, in *Agriculture*. See YOKE, and YOKING.

YOAK, *Jugum*, in *Antiquity*. The Romans made the enemies they subdued pass under the yoke, which they called *sub jugum mitere*; that is, they made them pass under a sort of furca patibularis, or gallows, consisting of a pike, or other weapon, laid across two others planted upright in the ground. This done they treated them with humanity enough, and sent them home again. See FURCA.

The same measure was sometimes dealt them by their enemies upon the same occasion. Thus Cæsar (lib. ii.) observes, that the consul L. Cassius had been killed by the Swifs, and his army defeated, and made to pass under the yoke.

YOAK of Land, *jugata terra*, in our *Ancient Customs*, was the space which a yoke of oxen, that is, two oxen, may plough in one day. See HIDE, YARD-Land, &c.

YO-CHIN, in *Geography*, a town of Corea; 10 miles N.E. of Han-tcheou.

YOCKLET. See JOCKLET.

YOCOM CREEK, in *Geography*, a river of Virginia, which runs into the Potomack, N. lat. 38° 6'. W. long. 76° 36'.

YOCOTE, a town of Hindoostan, in Dowlatabad; 27 miles S.S.W. of Mahur.

YOGESWARA, in *Hindoo Mythology*, a name of the Hindoo god Siva; which see. It means lord of ages, or of time; yug, or yog, being vast periods of time into which Hindoo chronologists arrange the past. The addition of Iswara, the powerful, a name of Siva, seems to give a satisfactory derivation. (See ISWARA.) For an account of those periods, see JOGUES. Some have derived the name of Yogeswara from lord of Yogis, supposing the sect of fancified beggars so designated as being more immediately under the protection of Siva; but this is in fact nearly the same thing, for yog signifies union or junction, and these periods of time re-unite all things in the Deity; and the Yogi by intense contemplation effects a similar union. But this metaphysical dogma cannot be explained here. See KALPA, YOGI, and YUG.

YOGI, a description of wandering fairs, much respected by many of the natives of India, though by others they are strongly suspected to partake more of the impostor than the enthusiast. There are many descriptions of these itinerants among the Hindoos; and we are not aware that the distinctions between them have been accurately pointed out. The appellation Yogi means a devout man, devoted to spiritual things, especially to the contemplation of the attributes of the Deity. It is derived from yog or yug, which, among very many significations, means primarily union or junction, and is applied in this sense to one who by intense meditation is united to the divine nature; a mysticism easily understood by the initiated and enthusiastic Hindoos, though not recognizable by others. There is a difference, we believe, between the Yogi and Sanassi, but we cannot exactly say in what it consists. In the latter part of the article SECTS of Hindoos, some particulars of these two will be found. Perhaps the Yogi may be the designation of the Vainhnava, and Sanassi of the Saiva sect. (See SAIVA, VAISHNAVA, and YOGESWARA.) Both profess poverty, purity, and austerities. When the latter are carried to any extent, the zealot is honoured with the title of Tapaswi, of whatever sect he be. Of such, and their austerities, see under TAPAS. We sometimes read of female anchorets denominated Yogni; but they are, we believe, merely enthusiastic females, who become ascetics and not

the wives of the fancified males. Among the oriental manuscripts presented to the Royal Society by sir W. Jones, is one entitled "Hatha Pradipaca, or Instructions for the Performance of the religious Discipline called Yoga."

In the Gita, Krishna describes the Yogi as being "more exalted than the Tapaswi, the zealot who harasses himself in performing penances: he is respected above the learned in science, and superior to those attached to moral works." This passage is quoted in the latter part of our article SECTS of Hindoos, but being erroneously pointed is scarcely intelligible. This article being thence referred to, we take the opportunity of correcting another error or two in it:—In the second column, the name of the Mahratta Brahman general, Purferam Bhow, is twice spelled Bhon; in the fifth column, the name of Vopadeva, the author of the Sri Bhagavata, is spelled Vapadeva; in the next column, line 21 from the bottom, a comma is wanted after Krishna. Having referred above to the article TAPAS, we will here correct an error in that also:—In second column, line 11, for inflexions read inflections.

YOHOGANY, in *Geography*. See YOUGHIOGENY.

YOIDES, in *Anatomy*, the bone of the tongue, commonly called hyoides. See HYOIDES.

YOINGT, or JOINGT, in *Geography*, a town of France, in the department of the Rhône and Loire; 7 miles E. of Roanne.

YOITSBACH, a river of Silesia, which runs into the Queis, near Friedberg.

YOKE, in *Agriculture*, a frame of wood hollowed out and lined for receiving the neck part of the ox or other cattle in working. Yokes are constructed in different manners, as single and double, in order to be used differently. They are fixed with bows over the necks of the oxen or other cattle when in use; by which means, in the latter sort, the two animals are coupled together, and attached to the plough or other vehicle. See YOKING.

YOKE, in *Sea Language*, a name formerly given to the tiller, when communicating with two blocks or sheaves affixed to the inner end of the tiller. It is now applied to a small board or bar which fits on the upper end of a boat's rudder at right angles, and having two small cords extending from its opposite extremities to the stern-sheets of the boat, by which she is steered as with a tiller.

YOKED LEAF, in *Botany*, *folium conjugatum*, or *bina-tum*. See LEAF.

YO-KEOU, in *Geography*, a town of Corea; 38 miles S. of Haimen.

YOKING, in *Agriculture*, the practice of putting the animals into the yoke or other sort of team.

In the business of yoking or harnessing oxen for the purpose of draught, different methods have been followed by different farmers. And the modes of harnessing and yoking oxen are even different in different counties, and districts of the same county. The most common practice in the southern parts of this kingdom, is that of working them in harness in the manner of horses; while in the northern counties, the yoke and bows are still much employed. On the continent, as in France, Portugal, &c. the head is the part to which the draught is chiefly attached.

In the first case, the shoulder is made the principal point of draught; but in the second method, the neck and shoulder conjointly have the weight of the draught; and in the last mode, the principle of draught is, in one case the head, and in the other the joint power of the neck and base of the horn, which lord Somerville has considered a purchase as great perhaps as can be given to the animal.

It is "effected by a long leathern strap, wrapped round the

YOKING.

the base or bottom of the horns, and again fastened to the yoke." It has been observed by a writer in the ninth volume of the *Agricultural Magazine*, that with respect to the second method which has been noticed above, the "usual form of the yoke is a frame of wood fitted over the necks of the oxen, by which they are coupled, and harnessed to the plough. It consists of several parts, as the yoke properly so called, which is a thick piece of wood, lying over the neck; the bow, which compasses the neck about; the flitchings and wreathings, which hold the bow fast in the yoke, and the yoke-ring and ox-chain," which is supposed "a method which is evidently founded on a total mistake in the anatomy of the ox."

And that in the first we have "imitated the gear used with the horse, without considering that the strength and agility of the ox are placed by nature in a different situation. The neck of the ox is a tower of strength; if the foil resist, he projects this part of his form with that prodigious muscular force with which nature has provided him for his own defence; but without attending to her operations, we impose a load of timber on his withers, we lacerate his flesh, and press him down to the earth."

The third or French mode of yoking is thus described in the words of Mr. Hughes. "The labourer passes a piece of wood, of about one-sixth of the weight of the English yoke, across the forehead of his cattle, having previously neatly hollowed out the extremities of it to fit the mould of the head, and lined those hollows with a piece of woolly sheep-skin, to answer the purpose of a soft pad or cushion. This light and easy yoke he braces to the horns with a small thong of leather, attaches the beam of his plough to the middle part of it, and the animal is completely equipped for his labour."

It has been observed by lord Somerville, in his *System of the Board of Agriculture*, that oxen, "whether worked in harness, or in the yoke and bow, as in England, by the joint power of the yoke and horn, as in Portugal, or by the head, as in France, they cannot fail to benefit their employer. As, however, the yoke and bow have prevailed for a considerable length of time, it is probable that the practice may still prevail, in which case the Portuguese mode of draught will apply with the utmost ease and success to our yoke and bow, so as gradually and imperceptibly to cheat oxen into its use. This in itself is an obvious advantage, because it gives two points of draught instead of one, and thereby relieving each admits of a lighter yoke, which in this country has ever been far too heavy and oppressive; and if hereafter the French method should be preferred, for which there are not wanting advocates, it is the best preparatory step to its introduction. It would be almost superfluous to remark that the strong points of an ox are in his head and neck. It is ordained by nature, that where the strength of an animal lies, there he will resort for defence; the horse to his heels, the man to his arms, and the ox to his head; and in cases of the greatest exertion, the beast ever puts his nose close to the ground."

In objection to the harnessing of oxen, it has been observed in the paper noticed above, that "the article of gear is an oppressive annual charge, from the perishable nature of the commodity employed. The tackle there recommended for twelve oxen would not amount to six-and-thirty shillings, whereas the leathern harness for the same number of animals, according to the new method, would cost six-and-thirty pounds, and the annual expence of repairs would exceed thrice the original cost of the former." And that "by the French mode of yoking, at least one-third more of the power of the animal is obtained. In the common way, the

shoulder being bruised by the unyielding bow, no vigour is exerted, excepting what is imparted by the goad; and the finews of the neck are not brought into employment; hence the sublime and gigantic force with which he is endowed is not rendered subservient in the important duties he has to perform for the supply of human subsistence. The cattle proceed in the French team bold and erect; no pain oppresses them, and they chew the cud cheerfully as they pace along the furrow. On the contrary, in this country the painful pressure obstructs the progress of the animals, they lean against each other, scarcely capable of supporting their own weight, and the fine intelligent eye which nature has given them to express the generosity of their temper is clouded with anxiety." That "the trial of this method has at least two recommendations; it may be made at very little expence, and under the fair expectation of success." See **TEAM**.

The methods of yoking cattle in ploughs are also different in different places; but the only circumstance worthy of being considered is, whether the cattle should be yoked in pairs, or in a line before each other. It may, therefore, be useful to consider the advantages and disadvantages attending each mode, and to compare them.

The most common way of yoking cattle in ploughs is in pairs. There are some disadvantages attending this way that are obvious. In ploughing the furrows betwixt ridges, the land-cattle go upon the ploughed land, and tread it down with their feet: this, especially if the land be wet, poaches and hurts it very much. And there is another disadvantage which is very obvious. When there is but as much of the ridge unploughed as to allow the land-cattle to go upon it with difficulty, they are frequently either going into the opposite furrow, and thereby giving the plough too much land, or, which is worse, they are jostling the furrow-cattle upon the ploughed land.

In order to remove the inconveniences which attend the ploughing with cattle yoked in pairs, some yoke them in a line before each other. It is obvious, that cattle yoked in this manner, going always in the furrow, neither tread upon the ploughed land nor jostle one another. In these respects, the yoking the cattle in a line before each other seems to have the advantage. It is to be observed, however, that this method is not quite free from inconveniences. When examined, it may, perhaps, be found attended with as great inconvenience as the other. Where cattle are yoked in a line, they go all in the furrow. This makes it necessary to give the plough more land than ordinary, either by the fock or the muzzle; for if this be not done, the head and fock being in the same direction with the beam, and the cattle yoked to the middle of it, the plough will directly follow the cattle without taking any thing off from the land. Now it is inconvenient to be obliged to give the plough land either by the fock or muzzle; for when the fock is turned out of the plane of the beam, it makes the plough heavy to draw; and when the muzzle puts the draught too much to one side of the beam, it prevents the plough from going upright. The yoking of the cattle in pairs is attended with none of these inconveniences; for in this case, the quantity of land which the plough has naturally, when right made, is sufficient to make it take off a proper furrow.

There is another inconvenience that attends yoking cattle in a line, arising from the nature of the animals, which is, that as they like their ease, they are disposed to throw the burden upon their fellows. They they have a better opportunity of doing when yoked in a line before each other than when yoked in pairs. When yoked in a
line,

line, each pulls by the traces of the one behind him; and therefore, though it may be known when the foremost neglects his work, by the slackening of his traces, it cannot be known when any of the rest neglect their work; for though one of them does this, yet by the pulling of the one before him his traces may be fully stretched. But this is easily discovered when the cattle are yoked in pairs; for then every one of them has a separate draught.

There is still another inconvenience that attends the common way of yoking cattle in a line before each other. When the fore cattle are all yoked to the traces of the hindmost, it is obvious, that as the beam to which the draught is fixed is much lower than his shoulders, by which the rest pull, such a weight must be laid upon his back or shoulder, as must render him incapable of giving any assistance. Besides, as the whole force is applied in the direction of the traces of the hindmost, it cannot have such influence on the plough, as when a part of it is in a direction more horizontal. When a body is to be moved forward in any direction, the nearer that the direction of the force applied approaches to the direction of the body, it acts with greater influence; and, therefore, as the plough moves horizontally, and as the direction of the united draught of a plough with the cattle yoked two abreast is more horizontal than the direction of the draught in a plough with cattle yoked in a line, the same force applied will have greater influence.

When these two different ways of yoking cattle in ploughs are thus considered and compared together, it is difficult to determine which ought to be preferred. Each of the two seems preferable to the other in a certain situation. When the land is stiff, and the labour severe, the yoking the cattle in pairs seems preferable, as it is certainly the strongest draught; and when the land is wet, and in danger of being much hurt by the treading of the cattle, the yoking them in a line before each other seems preferable; as thereby they are confined to the bottom of the furrow, which is the firmest part of the land, and prevented from doing harm.

In wet lands and seasons, as long teams answer best, for the most part, collars and trace-chains become of considerable utility in most cases in yoking of cattle; and in which ever way neat cattle are geared for work, they should constantly have bridles or bit-halters, with blinders, as by such means they are rendered docile, tractable, and easy to manage in the business of team labour. Much information on this subject may be seen in the Corrected Report on Agriculture for the County of Suffex.

YOKULS, in *Geography*, the highest mountains in Iceland, perpetually clothed with snow. Of these, Snezial, hanging over the sea on the S.W. part of the island, is said to be the highest, its height being computed at 6860 feet. The mountains are said to be chiefly sand-stone, pudding-stone, with petroflex, steatite, and argillaceous schistus.

YOLK, or YELK, in *Natural History*, the yellow part in the middle of an egg. See EGG.

The chicken is formed out of and nourished by the white alone, till it be grown to some bulk: after which the yolk serves it for nourishment; which it likewise does, in part, after it is hatched. For a good part of the yolk remains after exclusion; being received into the chicken's belly: and being there reserved, as in a store-house, is by the ductus intestinalis, as by a funnel, conveyed into the guts, and serves instead of milk. Willughby's Ornithol. lib. i. cap. 3.

This was even known to Pliny:—"Ipfum animal ex

albo liquore ovi corporatur: cibus ejus in luteo est." Lib. x. cap. 53.

Yolk, in *Rural Economy*, the peculiar nutritious secretion which exudes through the skins of sheep, and which by intermingling with the pile of the wool renders it soft, pliable, and in proper condition. It has somewhat the same effect on it which oil has upon a thong of leather, when kept in and perfectly saturated with it. The disposition to the production of this substance in sheep is favourable to the valuable properties of the wool, and should be attended to by the sheep-farmer in fixing and regulating his flock. It is noticed by a late writer on *Agricultural Chemistry*, that wool often washed in calcareous water becomes rough and more brittle than usual, as the carbonate of lime has the power of dissolving or decomposing the yolk of it, which is an animal soap that naturally defends it; that the finest wool, such as that of the Spanish and Saxon sheep, is most abundant in yolk; that M. Vauquelin has analysed several different species of yolk, and has found the principal part of all of them a soap, with a basis of potassa, that is, a compound of oily matter and potassa, with a little oily substance in excess; and that he has likewise found in them a notable quantity of acetate of potassa, and minute quantities of carbonate of potassa and muriate of potassa, and a peculiar odorous animal matter.

The same chemical writer has stated, that he found some specimens of wool lose as much as forty-five per cent. in being deprived of their yolk; and that the smallest loss in his trials was thirty-five per cent.

It is suggested in the above work, that the yolk is the most useful to the wool on the back of the sheep in cold and wet seasons; and that probably the application of a little soap of potassa, with excess of grease, to the sheep brought from warmer climates in our winter, that is, increasing their yolk artificially, might be useful in cases where the fineness of the wool is of great importance. A mixture of this sort is more conformable to nature, it is thought, than that ingeniously adopted by the late Mr. Bakewell; but that at the time his labours began, the chemical nature of the yolk of wool was not known. See WOOL, WASHING Sheep, &c.

YOLK of the Seed, *Vitelus*, in *Botany and Vegetable Physiology*, a part first described by Gartner, and thus named by him, from its supposed analogy with the yolk of an egg. This analogy, and even the existence of the part in question, have been disputed, as Mr. Brown hints, in *Prodr. Nov. Holl.* v. 1. 306, by M. Correa de Serra, and by the writer of the present article. We have never at any time communicated on this subject with our learned and sagacious friend, now the Portuguese minister at New York; so that we are ignorant how far his objections extend, or on what they are founded. Nor does Mr. Brown know more of this matter, than a simple record of M. Correa's opinion, in *De Candolle's Flore Française*, v. 1. 157. This coincidence, however, from such a quarter, gives us great confidence in our own opinion, which was first offered to the public in *Introductio Botany*, chap. 19, published in 1807. On a more attentive and full consideration of the question, the same sentiments were more explicitly detailed and defended in a paper read before the Linnæan Soc. Nov. 3, 1807, and printed in that Society's Transactions, v. 9. 204.

Gartner states the *Vitelus*, or Yolk of the Seed, to be "distinct from the *Cotyledons*, as well as from the *Albumen*, and for the most part situated between the latter and the *Embryo*." (See SEED, where a reference is made to VITELUS, under which head the substance of the present article

was designed to have been inferted.) Gærtner considers the part of which we are about to treat, as "of all the internal parts of a feed the most singular, and by far the most unferquent." Its importance therefore cannot be very confiderable. The principal diagnoftics of the *Vitellus*, according to this eminent carpologift, are the following: 1ft, "It is moft clofely connected with the *Embryo*, fo as not to be feparable therefrom, without injury to its own fubftance. 2dly, Notwithftanding this intimate connection, it never riles out of the integuments of the feed, as the *Cotyledons* ufually do, in germination, fo as to become a feminal leaf; but, rather like the *Albumen*, its whole fubftance is destroyed by the feeding plant, and converted into its own nourifhment. And 3dly, If the *Albumen* be likewise prefent, the *Vitellus* is always fituated betwixt that and the *Embryo*, in fuch a manner, however, that it may be feparated from the *Albumen* with great eafe, and without injury." For thefe reafons, Gærtner confiders the organ in queftion as "allied on the one hand to the *Albumen*, on the other to the *Cotyledons*," but truly diftinct in nature from both.

We prefume to differ from this decifion of the great writer, whofe words have juft been quoted, for the following reafons: 1ft, The *Vitellus* is certainly not more clofely connected with the *Embryo* than the greater number of *Cotyledons* are, as any perfon may find by examining feeds in the firft ftage of their germination, and as the faithful delineations of Gærtner himfelf every where fhew. 2dly, That the *Vitellus* never riles out of the ground, is a circumftance likewise common to many *Cotyledons*, allowed by Gærtner to be fuch, as in various leguminous plants, as well as in *Æfculus*, *Cyamus*, *Tropæolum*, and many others. The difference between *Cotyledons* which grow up into feminal leaves, and thofe which remain and decay under ground, is of fo little importance as to the claflification of plants, that the moft natural order of *Papilionaceæ*, or *Leguminofæ*, contains decided inftances of both; *Lupinus* and *Vicia* affording examples of the former mode of growth, *Lathyrus* of the latter. And 3dly, The fituation of the *Vitellus*, between the *Albumen*, if the latter be prefent as a feparate organ, and the *Embryo*, is only a neceffary confequence of the more intimate connection between the *Vitellus* and the *Embryo*, than either of them has with any other part, except that of the *Cotyledons* and *Embryo*, which is as ftrict as can poffibly be. Hence we cannot confider the *Vitellus* of Gærtner to differ from the fubterraneous *Cotyledons* above-mentioned. We prefume their offices muft be exactly fimilar, to perform the neceffary functions relative to air or oxygen, till the leaves come forth, and afsume thofe functions in greater perfection, with the co-operation of light. This appears to us more fatisfactory than the hypothefis of Gærtner, that the organ of which we are treating affords nourifhment to the *Embryo*; becaufe this is abundantly fupplied by the copious *Albumen* of a multitude of feeds, whofe *Vitellus* is very inconfiderable, fuch as graffes; and it is recurring to two caufes to explain what is evidently accounted for by one alone. If the vegetation of corn be obferved, the *Vitellus* will be found to dwindle away, with fcarcely any change in its very inconfiderable bulk, when the firft leaves are unfolded, exactly as happens to the fubterraneous *Cotyledons* of *Lathyrus odoratus*, &c. The fame thing very often takes place as fpeedily in *Cotyledons* which rife out of the ground. Some which are more permanent, as in cruciform and umbelliferous plants, being only more of the nature of leaves. In graffes, the fcale taken by Gærtner for a *Vitellus* is moftly fo thin and unfubftantial, as not poffibly to contain any material portion of nourifhment; ample fupplies of which are furnifhed by the plen-

tiful *Albumen* of thofe plants. But its expanded figure is very well calculated, like that of the leaves, for functions analogous to vegetable refpiration; and it has the evident afpect of a fubterraneous leaf, quickly rendered fuperfluous by the production of real leaves, and withering away, as the firft of thofe leaves themfelves do, when more vigorous ones come forth. It is remarkable, that the pretended *Vitellus* appears not to be neceffary to all plants furnifhed with this diftinct kind of *Albumen*, as *Palme* and *Orchideæ* have it not; while, on the other hand, no inftance prefents itfelf of a fupposed *Vitellus*, and a real *Cotyledon*, or *Cotyledons*, in the fame plant. Gærtner takes the *Plumula* for *Cotyledons* in *Rhizophora* (fee his t. 45.), as well as in fome of the *Scitamineæ*; for we cannot conceive the tubular part, embracing the *Embryo*, in *Amonum*, (fee Gært. t. 12, which he erroneoufly calls *Zingiber*.) to be any thing but a *Cotyledon*, notwithstanding the opinion of our learned friend Mr. Brown, who, like Gærtner, terms it a *Vitellus*. The name would be of little importance, if the fupposed ufe of it did not convey, as we prefume to think, an erroneous idea; in attributing to thefe feeds two diftinct and feparate fources of nourifhment. That two fuch diftinct parts exift in this natural order, and perhaps, as Mr. Brown obferves, in *Nymphæa* and *Nuphar* likewise, we are ready to admit; and we are therefore more fatisfied to attribute to each a feparate and appropriate office. We have had no opportunity of obferving the germination of *Amonum*, or any true fcitamineous plant; but as far as we have been able to judge, it appears that the *Albumen* of every feed, when feparate from the other parts, is always totally abforbed, or removed, leaving its fkin empty; whereas a *Cotyledon* withers and fhinks in its whole fubftance, like a decaying leaf. If the albuminous matter, neceffary for the temporary nourifhment of perhaps every feed, in one form or other, be lodged in the fubftance of the *Cotyledons*, as in *Zamia*, the leguminous and cucurbitaceous tribes, and many others, fuch parts fhink the more, but do not lofe any one particular portion of their fubftance, fo as to have only a fkin left behind. Perhaps a confufion of ideas has arifen, from the firft confideration of this fubject, in confequence of the term monocotyledonous as contrafted with dicotyledonous. The firft had an evident reference to the *Albumen*, in corn, palms, &c.; and when Gærtner had emancipated himfelf from this error, he feems to have transferred the idea to the *Embryo*, which he calls *monocotyledonous*, as if he meant by that word to exprefs its own fimple form. Prepofted with this idea, when a feparate organ manifefted itfelf, as in the *Scitamineæ*, he thought a new appellation requifite. Mr. Brown objects to the term *Cotyledon* in this cafe, becaufe he fays there is no point of union between the part in queftion and the *Embryo*. If fuch be the cafe, which we cannot underftand, it would be not at all lefs difficult to conceive how this part could, as a *Vitellus*, fupply the *Embryo* with nourifhment, than it would be to imagine how it could perform any fervices towards that organ with refpect to air, in its capacity of a *Cotyledon*.

It feems to us, that by confidering the *Vitellus* of Gærtner as a *Cotyledon*, all ambiguity refpecting the anatomy or component parts of any feed is removed. When the *Cotyledons* are two or more, the albuminous matter is either lodged in their fubftance, or forms a feparate part. In the latter cafe, it has no more connection with the *Embryo* than is abfolutely neceffary, being in fact not an organic part, but a mere refervoir of food or nourifhment, immediately undergoing a chemical change, after which its whole fubftance is fpeedily abforbed. Such is the economy of corn- and palms; even the large *Albumen* of the cocoa-nut foon dif-

appearing, for the evolution and fufurance of the little *Embryo*, lodged in a cavity of its bafe; while the *Cotyledon* of the not very diftant genus *Zamia* fhinks indeed confiderably, from lofing the albuminous part of its fubftance, but does not difappear; becaufe the remaining part deftined to perform the effential office of a *Cotyledon*, refpefting air, merely decays when its purpofe is anfwered, and floughs off, like any other dead portion of the vegetable body.

We have already (fee GERMINATION) adverted to thefe two different fituations of the albuminous matter. That fubftance muft be prefent, in fome fhape or other, for the nourifhment of the young *Embryo*, at the firft period of its evolution, when fo great an alteration of bulk takes place, till it can fupply itfelf from the earth. The idea of this nutritious fubftance, whether of an oily, mucilaginous, or farinaceous nature, being always, when not a diftinct body, lodged in the *Cotyledons*, throws additional light on the nature and phyfiology of thefe laft-mentioned parts, and in a very beautiful manner confirms their analogy with leaves. The tap of plants (fee CIRCULATION of the Sap) being carried into the leaves, and there acted upon by air, light, heat, and moifture, is returned in the form of various fecretions, into the different parts of the vegetable body. Under the influence of light, the upper furface of their leaves abforbs carbonic acid gas, and the under gives out pure oxygen. But in the dark, leaves abforb oxygen. So the *Cotyledons* of feeds, in their dark fubterraneous fituation, being moreover often guarded exprefsly from light by a brown or even black fkin, abforb oxygen, which, as we have faid in the article above cited, is known to be neceffary to germination. They are already ftored with albuminous matter, abounding with the carbonic principle. This, by the action of oxygen, becomes faccharine and milky, fit to be tranfmitted, through the returning veffels, which the *Cotyledons*, in common with *Leaves*, poffefs, into the item of the *Embryo*; all thefe important parts having already begun to fwell, from the abforption of moifture, and the ftimulant effects of heat. Hence we fee why light proves hurtful to incipient germination, and why carbonic acid gas may be given out by feeds during that procefs. It is evident that the proper functions of *Cotyledons* are beft performed under ground, and that when they rife into the air and light, it is not till after their primary deftination is fulfilled, and then only becaufe, being fundamentally of the nature of leaves, they are moftly capable of affuming the functions of thofe organs, with refpect to light. *Cotyledons* of feeds are fubterraneous leaves, juft like the fcales of a bulbous root. Both are ftored with albuminous or nutritious matter, and when acted upon by oxygen perform under ground thofe functions, which leaves perform in the open air, with the affiftance of light. It is worthy of notice that the *Cotyledons* are fo placed, in all feeds, that the oxygen gas muft be imbibed by their under furface only, that very fame part which, in leaves, gives out this kind of gas during the day, and probably abforbs it at night. "It would," as we have elfewhere obferved, Tr. of Linn. Soc. v. 9. 213, "have evinced a ftrange contrariety in the conftitutions of two organs otherwife fo analogous, the *Leaves* and *Cotyledons*, if the upper furface of the latter, while in the unexpanded feed, had been prefented to receive the oxygen gas."

By taking the *Vitellus* of Gertner for a *Cotyledon*, we throw no new difficulties in the way of the claffification of plants by this organ. Its form is always, as far as we know, fimple and undivided, fo that the plants in which it occurs remain only the more fteadily fixed in their place of *Monocotyledones*, as oppofed to the *Dicotyledones*; witnefs *Gramina*, *Scitamineæ*, &c. thus indeed acquiring a right to

ſuch an appellation, which they could otherwife fearcely claim, having, according to Gertner's principle, no *Cotyledon* at all.

YOLOTOU, or YULDUZ, or *Cyalis*, or *Chialifh*, in *Geography*, called by the Turks Keraffer, or the Black City, a town of Little Bucharia, fituated in a country abounding with fprings and fine meadows; 85 miles N.N.W. of Hami.

YOM-NIM-KIEN HOTUN, a town of Chinefe Tartary, on the E. coaft of the gulf of Leao-tong; 263 miles E. of Peking. N. lat. 40°. E. long. 121° 34'.

YOM-TA-HOTUN, a town of Corea; 648 miles E.N.E. of Peking. N. lat. 42° 55'. E. long. 129° 37'.

YON, a river of France, in the department of the Vendée, which paffes by La Roche fur Yon.

YONGHELAHE, a river of the ifland of Madagafcar, which runs into the fea on the weft fide of the ifland, S. lat. 23° 50'. E. long. 47° 4'.

YONG-LI, a town of Corea; 30 miles S.E. of Koang-tcheou.

YONG-NGAN, a city of China, of the fecond rank, in Quang-li; 1027 miles S.S.W. of Peking. N. lat. 24°. E. long. 110°.

YONG-NGAO, a fmall ifland near the coaft of China, in Quang-tong; 20 miles S.S.E. of Macao.

YONG-NING, a city of China, of the firft rank, in Yun-nan, on the borders of Tibet. A little to the E. of this town is a lake; 1095 miles S.W. of Peking. N. lat. 27° 50'. E. long. 100° 24'.—Alfo, a city of China, of the fecond rank, in Quang-fi; 977 miles S.S.W. of Peking. N. lat. 25° 6'. E. long. 109° 14'.

YONG-NING, or *Yung-ning*, a city of China, of the fecond rank, in Koei-tcheou; 1027 miles S.S.W. of Peking. N. lat. 25° 55'. E. long. 104° 57'.

YONG-PE, a city of China, of the firft rank, in Yun-nan; 1150 miles S.W. of Peking. N. lat. 26° 42'. E. long. 100° 34'.

YONG-PING, a city of China, of the firft rank, in Pe-tche-li, on a river which runs into the gulf of Leao-tong. This city is advantageoufly fituated, but its jurifdiction is not very extenfive; it contains but one city of the fecond order, and five of the third. It is environed by the fea, by rivers, and by mountains, covered for the moft part with fine trees: this makes the country lefs fertile, but the neighbouring bay fupplies its want with great plenty of all the neceffaries of life. Not far from this city ftands a fort named *Chum-bai*, which is the key of the province of Leao-tong. This fort is near the beginning of the great wall, which is built, for a league together, in a boggy marfh, from the bulwark in the fea; 115 miles E. of Peking. N. lat. 30° 55'. E. long. 118° 34'.

YONG-SIN, a town of Corea; 113 miles E. of Hantcheou.

YONG-TCHANG, or YUNG-TCHANG, a city of China, of the firft rank, in Yun-nan. This city is large and populous, and is built in the midft of high mountains, on the borders of the province, in the neighbourhood of a favage people, whofe genius and manners the inhabitants of this country partake of. The country produces gold, honey, wax, amber, and a vaft quantity of fine filk. It has within its diftricts one town of the fecond order, and two of the third; 270 miles S.W. of Peking. N. lat. 25° 6'. E. long. 99°.

YONG-TCHEOU, a city of China, of the firft rank, in Hou-quang; 882 miles S.S.W. of Peking. N. lat. 26° 10'. E. long. 111° 15'.

YONG-TONG, a town of Corea; 40 miles E. of Het-tin.

YONI, in *Metaphysics*, the name of a mysterious symbol among the Hindoos; which, although contemplated with respect and awe by that superstitious race, is yet of such a nature as not to be discussed without difficulty in the living language of a country which has happily shaken off the trammels of priestcraft; and views with pity, mixed with just abhorrence, the idolatrous propensities of those still retained in mental bondage; accompanied, as we find they were, among many ancient people, by the indecencies of impure rites, scarcely yet difused, even in Europe, and existing in almost undiminished grossness in the still unenlightened regions of Asia.

The reader is supposed to be more or less aware of the nature of the orgia incident to the worship of such deities as Pan, Priapus, Bacchus, Venus, &c. We do not here inquire particularly into the origin of such rites. In their earlier stages, they were probably an innocent ebullition of gratitude for the experienced bounties of nature. In the lapse of time, a concourse of people of both sexes, warmed by exercise and beneficent feelings, at a genial season most likely of the year, found, as is ever the case, their unrestrained devotion sublimed into enthusiasm; and hurried by such feelings beyond the scope of unassisted reason, gave themselves up to the extravagances of mysticism, and in the end to excesses which not only Christians, but the decent of every sect and country must unite in reprobating. These Bacchic phrenzies were accordingly suppressed or mitigated as to their offensive usages and tangible abominations. Nature, in the phraseology of certain sects, was no longer propitiated through the indulgence of feelings of her own prompting, excited farther by the presence of unequivocal exhibitions. She, still personified, was more decently represented by certain symbols substituted for the earlier types. The cunning priest no longer daring to exhibit their obscenities in shameless nudity, permitted only a portion of indecency to remain in the hands and eyes of their deluded votaries, and concealed their origin and meaning in the various mysteries and hieroglyphics denominated Bacchic, Eleusinian, Phallus, Linga, Yoni, Cone, &c. &c. Some notice of these things, and of the ordinary course and consequences, will be found under the appropriate articles of our work; also in MYSTERY, MYSTICS, and others thence referred to.

By such people Nature was contemplated chiefly under her attribute or property of fecundity; and symbols of generative allusion were those under which her prolific potencies were exhibited. Those prone, like the Hindoos, to resolve almost every thing into sexual allegory, of course fancied the male and female pudenta omni-archetypal. These, in the early days of such perverted devotion, were probably portrayed in India, as elsewhere, without reserve; but were, in most cases, soon corrected into the comparative decency of the hieroglyphics; and the deluded people were cajoled by mummery and mystery, that became less and less understood, and therefore, perhaps, the more revered. We have said in most cases; for in Egypt and Greece the grossness of Phallism is known only in the remains of antiquity; in India it doubtless exists, but divested of obtrusive or conspicuous indecency; and too true it is that among Christians was the primeval infamy of the symbol and usage most tenaciously retained. We can but just allude to the discovery of this curious though lamentable fact, by Sir William Hamilton, in the neighbourhood of Naples. His

communication, with ample commentary and illustration, has been printed, but very properly not published; concealed, though not suppressed; and we therefore make no direct reference to the sufficiently intrusive, though too disgraceful volume, in which this disgusting worship is proved to exist in Christian Europe, and is traced almost all the world over.

Among the Egyptians, Greeks, and Romans, the Phallus and the Cone seem to have been the earliest of the grosser and corrected emblems; the latter contained both the Linga and Yoni, nature active and passive; and similar, familiar, or recondite meanings and allusions were thus readily revived in the minds of the vulgar and the initiated, suitable to the esoteric or ifoteric nature of their capacities and feelings. These fooleries, to give them no harsher name, thus found to have existed among the people just mentioned, and others, have, with great appearance of reason, been suppositively derived from the still more ancient usages of India. Much might be said in support of this, were it worth while; and thus far the inquiry will probably be repaid, that it may bring to light many strange coincidences. If such writers as Colebrooke, Wilford, Faber, and others, who bend their minds to the development and elucidation of Eastern literature and mysteries, continue for a while in the same line of research, we anticipate a confirmation of the surmises long entertained, that nearly all the learning, science, and art, as well as the religion of Egypt and Greece, originated in India, or at least with the Brahmans; however much they may have been improved or embellished by the hands through which they reached us.

India then, or the country of the Brahmans, wherever that was, being in our judgment the region where the superstitious practices now under our consideration originated, we may expect to find its early history teeming with allusions to it. This is indeed the case; though such allusions are not, perhaps, found in its *earliest* works on theology. But as no people have changed so little as the Brahmans and their flock by the innovations of strangers, or the lapse of time, (for frequent subjugations by conquests seem to affect them but little, and persecutions serve only to confirm their prejudices,) we may expect to find their religious institutions and practices more in accordance with those of their early days than the usages of other people who have not disdained to become wiser by the operation of reason and philosophy; and who have been taught to look on the follies of their ancestors with the pity they deserve. In India, we thus find certain hieroglyphics still receiving the external adoration so little their due. There we find the infamous Brahman still teaching his ignorant suppliant to fall down and worship the Linga and Yoni; symbols, in whatever shape exhibited to the public eye, no doubt fitter for the brothel than the temple. The former of these is the attribute of Siva, the Maha-deva, or great divinity presiding over reproduction, or regeneration in the abstract; and the other of his consort Devi, or Parvati, the Magna-Mater, the Bona Dea of the East.

In preceding articles, we have necessarily touched on the character and attributes of the two just mentioned grand divinities of the Hindoos; and refer our readers to PARVATI and SIVA for our remarks thereon, and to LINGA for a brief notice of the Phallic worship of India. In this article, we propose to discuss that still offered to the Juno, the Venus, the Isis, the many-named all-absorbing goddesses of the Hindoos, whose emblem is the Yoni.

Writers on this subject generally, perhaps unavoidably, commix their speculations on the Linga and Yoni. Crude nature

nature is personified, and called Prakriti; she is declared to be nature, or the earth, the womb of nature; she is thence any thing conceiving or containing, or the power or faki of such faculties. In its first state that power was rather a tendency, an aptitude, and laid dormant until excited by the *bija*, or vivifying principle, the *aura* of nature personified in Siva, who in this character is called Parusha, or the primeval male. Here we find nature passive and active: the power or aptitude of nature is symbolized by the Yoni; the vivifying principle by the Linga. Prakriti is found to be one of the names and forms of Parvati, as Parusha is of Siva. Under these names we have taken some notice of their character; but it is not easy, in the short articles to which, in these matters, we must restrict ourselves, to explain fully, were we able, the nature and allusions of these abstract personifications.

The faculty or power of containing, of which the Yoni is the type, is also called Argha by Hindoo mytics. The name is given to a cup or dish, or vessel, in which fruits and flowers are offered in oblation. These vessels, they say, ought always to be *boat-shaped*; and so they frequently are, but sometimes round, oval, or square; mostly, however, circular. All this is mysterious and profound. The rim of the Argha is more especially the Yoni, while the contents of the vessel represent the Linga, which is sometimes more unequivocally figured by an image of Siva standing erect in the centre of the Argha. Hence one of his names is Arghanatha, or lord of the boat-shaped vessel. We may stop a moment here to remark how readily Bryant, Faber, and the race of Noetics, would have recognized the ark, in the arga or arka, or ark, as it may without much licence be written, of the Hindoos. We do not hesitate to hint our belief that many of the fables connected with Colchis, Juno, Io, Ionia, Jonah, &c. are traceable upwards to Hindoo words: many also connected with the names of places or persons, beginning with Col or Kal, or containing its root, that are scattered in unmeaning profusion through the geography and early biography of Europe. But this is not the place to enlarge on this subject.

The Argha, as a type of the *power of conception*, excited and vivified by the Linga or Phallus, Mr. Wilford (A. F. Ref. vol. iii.) supposes to be one and the same with the ship Argo, which, according to Orpheus (Argon. v. lxxi.), was built by Juno and Pallas, or, according to Apollonius (b. ii.), by Pallas and Argus, at the instance of Juno. The word Yoni, as it is usually pronounced, nearly resembles the name of the principal Etruscan goddess; and the Sanskrit phrase Arghanatha Iwara seems accurately rendered by Plutarch (on Isis and Osiris), when he asserts that Osiris was commander of the Argo. That the Sanskrit words *p'bhala*, meaning fruit, and *p'hulla*, a flower, had ever the sense of *phallus*, is not affirmed; but as these are the chief oblations in the Argha, and are confessed to be a representation of the Linga, their founds may easily have been so transferred. We have seen, too, that Mahadeva himself, the prototype of the Linga, is sometimes placed erect in the Argha: this is to complete a mystical triumph of powers; for Vishnu, the principle of humidity and of conservation, is symbolized by a convexity or embossment in the centre of the Argha, over which the image of Mahadeva, or the p'hala and p'hulla, as representing the Linga or Phallus, are placed. The idea that the Sanskrit p'hala or p'hulla may in sense as well as found be cognate with and the source of the Greek phallus, derives strength from the fact that Mahadeva, in his character corresponding with that of Jupiter Marina, or Neptune, bears, like his Roman kinsman, a trident, called

Trifida, and sometimes Triphala, denoting trifurcation and triflorescence. Jupiter Triphylus is thus identified with the three-eyed Siva, who in this form is named Trilokhan and Trifida.

That the Sanskrit language is very widely spread, and is traceable in various dialects, we have the authority of Mr. Colebrooke for believing. In the names of places, we are inclined to think its extension is proved as much as in any point: and we do not deem the idea very extravagant (says our correspondent) that derives the name of Trafalgar, the scene of the last grand triumph of the British Neptune, from the mythological language of our fellow-subjects of India.

To return to the Yoni or Argha, we have seen that the vessel under the latter denomination is boat-shaped, and a type of the world. In the general Deluge, the generative powers of nature, male and female, reduced to their simplest elements, the Linga and Yoni, assumed this shape for the preservation of mankind. Brahma, the creative power, is represented to have been asleep at the bottom of the abyss. This alludes, we suppose, to the destruction of mankind; man being represented in the abstract by Brahma. The Yoni becoming boat-shaped, the Linga was the mast, and protected by Vishnu rode upon the waters. This, though sufficiently gross, is doubtless an arkite allegory. Every thing hollow or concave having the property of containing, remind mytics of their type the Argha or Yoni, as aspiring objects do of the Linga. Enthusiasts see these two principles; that is, they say, nature passive and active, dormant and revived, every where and in every thing,—the earth, the sea, a boat, a well, a pond, the hollow of the hand, clefts in rocks, excavations, caves, commensures of branches, &c. partake of relationship with the one,—mountains, especially if insulated and conical, pyramids, cones of any sort, fire, a mast, a tree, especially if denuded of branches, obelisks, &c.—all these connect themselves with ideas of Mahadeva and the Linga. The earth is typified by a boat; the Argha of the Hindoos, and the Cimbium of the Egyptians. Osiris is represented in a boat carried by men: in India, Mahadeva erect in the Argha refers to the same allegory. All over India, the Argha, and Linga of stone inserted in it, is found an object of worship. It is strewed with flowers, and water is poured on the Linga, and conveyed off by the rim or Yoni; the fossa navicularis or mystical boat of Isis.

Caves we have noticed as types of the Yoni, from their property of hollowness or containing, and also from the shape of their mouth. It will be recollected, that the most ancient oracle and place of worship at Delphos was that of the earth in a cave, which was called Delphi; an obsolete Greek word, synonymous, according to Mr. Wilford (A. F. Ref. vol. vi.), with Yoni in Sanskrit. Similar superstitions have prevailed farther westward. Perforations and clefts in stones and rocks were called Cunni Diaboli by early Christians, who usually bestowed the appellation of devils on the deities of the heathens. One of the wonders of the peak in Derbyshire retains an appellation still coarser: but Mr. Wilford thinks improperly; for this wonderful cave, or one he says very like it, particularly noticed in the Puranas, is declared to be the sacred Yoni. The cleft called Guhyasthan, in Nepal, answers fully and literally to the coarse appellation of its relative in Derbyshire, (Guhya, or Podex,) and is devoutly worshipped by numerous pilgrims from all parts of India. Perforated rocks or stones, as well as the mouths of caves, are mystically contemplated in India. A regeneration is effected by passing through them; or, if the hole be too small, a hand or a foot thrust through, with a sufficient faith, will nearly answer the same purpose.

It is difficult to discuss such subjects as these without feeling a certain degree of contempt, pity, and wonder, at the fooleries of creatures called rational. But when we recollect that many millions, hundreds of millions probably, of our fellow mortals are, or have been, thus misled, and have been similarly misled in all parts of the world, the origin and spread of such usages become a subject not unworthy the inquiry of the philosopher: as connected probably with the history of stupendous events in sacred history, it claims also the attention of the theologian; and the total disuse of all such irrational superstition among ourselves is a matter of gratulation to us as reformed Christians. We are disposed, however, to view it in all cases as an invention and engine of priestcraft, and not much more to be charged on the religion of the Hindoos and others, than the mummeries practised at Loretto, Naples, and elsewhere, are justly chargeable on Christianity.

Connected with the symbols and rites of the Yoni, we had prepared to offer some remarks shewing the spread of similar superstitions almost all over Europe, as well as in other regions. And, indeed, although their origin and allusion are now wholly forgotten, curious observers may discern in still existing usages occasional relics of this species of devotion even in England. It is inexpedient, however, to indulge in this extended view.

Adoration of stones is found similarly spread through the superstitious ages of all nations. The Hindoos retain it with undiminished bigotry; and will affirm, and indeed go night to prove, that such objects, from the sacred monolithic subject of the Kaaba at Mecca, or the obelisks of Egypt, to the trilithic temple at Stonehenge, with many intermediate, are no other than their Linga, under various forms and denominations. The Bætilia of antiquity are nearly related to it. Under BÉTYLOS, CROMLECH, KISTVAEN, STONEHENGE, and other articles of this work these referred to, the reader may, if desirous, see the extent of speculation to which the superstition connected with *Lithijm*, if such a term may be allowed, has given rise.

Clefts in rocks, rent by the hand of nature, may therefore be supposed to be profoundly venerated by such enthusiasts as are Hindoo mytics. One of the most celebrated in India, as far as we have heard, is at the promontory on the island of Bombay, called by the English Malabar point. The promontory itself, thrusting its apex into the sea, which there forms a sandya, or junction, (see JUNCTIONS,) is *Lingaic*. It used to be much resorted to, and its sin-expelling potency much relied on, before its purity and privacy were polluted and interrupted by the presence of strangers, and the increasing population of the island. The unequalled density of its present population, and the extending prevalence of foreign manners, have lessened the sanctity of this spot, now the constant resort and abode of persons who look on the local superstitions with an eye too rational or curious—or severe shall we say?—to encourage their continuance. Like the Lithic Linga temple of its neighbouring island of Elephanta, as the English call it, the Yoni of Malabar point will soon cease to be resorted to. Its fine temple is levelled to the rock whence it arose, and some of its spoils adorn the Museum at the India House. The neighbourhood of Bombay was in former times a grand assemblage of Hindoo temples. The great beauty and salubrity of the situation, the forms of the hills and islands, and other real and fanciful advantages, combined to give it high charms to the tasteful and cunning Brahman. An island rising conically is, we have seen, itself a Linga, its shores a Yoni, the ocean an Argha. The demoralizing effect of this perverted philosophy on the mind

of the simple Hindoo might be exemplified by a citation from our great dramatic poet, slightly altered:

“ — And this their life, exempt from public haunt,
Found Lingas in stones, Arghas in running brooks,
Yonis in rocks, and gods in every thing.”

Passing through such clefts as we have just noticed with a peculiar or expiatory view is, or rather has been, of extensive prevalence. We could shew it to have existed in many parts of Europe. Relics of it still exist in England. And indeed such is the recent rage of theological innovation, and the amazing increase of credulity, that a zealous sectarian need not despair of seeing these, or usages equally ridiculous, revived among us. But it would not suit the crafty Brahmans to allow rich delinquents to ease an expiation as the passage through a cleft or Yoni of rock. In certain cases of desilement, it is required that an image of pure gold be made of the female power of nature, either in the form of a woman or of a cow: in this statue, the person to be regenerated is enclosed, and is protruded through the usual channel. As this evidently must be enormously expensive, it is of course rarely resorted to. An instance is given in the Hindoo Pantheon, p. 398. of a recent case where a Yoni of gold was the medium of regeneration to two Brahmans, who had suffered pollution by coming to England. The desilement of a natural birth is done away by the protrusion of the person or head through a sacred thread called *Zennar*. (See that article.) This regeneration is essential to Brahmanical purity, and is also required of the two next tribes. The individuals thereafter are denominated *twice-born*. The fourth tribe is not allowed to be thus purified, and is therefore considered as base and unclean. See *SECTS of Hindoos*.

Enough has been said under this article to shew the mysterious bearing of its title. It is a subject which, connected with the Linga, meets the observer or inquirer directly or allusively, though not ostensibly, or very often in an offensive form, at every step he takes in the investigation of Hindoo literature or antiquities. Respecting the non-offensiveness of their appearances, we refer to our article LINGA; of which indeed this may be considered as a continuation. The subject is inexhaustible, but to us not inviting, though it must have been so to others. It might not be exaggeration, if it appear so, to say, that more speculation exists hereon in the languages of India than would fill a volume equal to our whole Cyclopædia! Reference to earlier articles descriptive of the Yoni and its attributes and allusions enables us to abridge this, which is, however, even combined with what is said in those articles, still and necessarily incomplete. See KAMALAYONI, LILESWARA, LOTOS, MERU, PATRA, RADHA, SAIVA, SAMI, SAMI-DEVI, and *SECTS of Hindoos*. From the article SAMI reference is made to this, and we take this occasion to correct an error in the former: in col. 2, line 24 from bottom, for *friction* read *friction*.

Individuals, chiefly of the sect called Sakta, meaning worshippers of the Sakti, or female energy of Mahadeva, the deity of reproduction, propitiate the goddesses under the form of the Yoni, the mystical matrix of nature. Of this, see under SAKTA and SAKTI. Such individuals have the sectarian appellation of Yonija. In what they differ from the Sakti, if they differ at all, we are not informed. These sects may be supposed to comprise but few persons; but this is a point on which information is obtained with difficulty. Respectable individuals, if there be any such belonging to it, are ashamed to avow being Saktas; and from persons of a different sort information is not to be relied on.

Writings,

Writings, too, on these subjects, are very obscure; their endless Scholia equally so, and can be critically understood by very few Europeans, even with the assistance of a learned native, who, assumed probably of what he is desired to explain, will, with almost laudable delicacy or deceit, gloss over the half-revealed obscenities of his brethren.

The common tendency in the nature of the adoration of the Linga and of the Yoni might, one would think, have united their worshippers in a community of object and view. But such are the anomalies and perversities of the human mind, that it appears to be a historical fact, that the Lingajas and Yonijas have actually not only disputed and quarrelled respecting the comparative merits of their respective hieroglyphics, or, in other terms, the paramount potentiality of the archetype; but that bloody wars have arisen between them on the question, which, as far as now appears, seems really to have been one of physiology: the only instance, probably, in which such a question hath ever operated as a cause of holy war, manifold as those causes unhappily have been. The Yonijas insisted, it seems, on a superior influence in the female over the male nature in the production of a perfect offspring. The consequent disputes and warfare the Hindoo writers have, as usual, recited in extravagant allegories, which we should call obscene, but which they consider as awfully sacred.

"This diversity of opinion," says Wilford, "seems to have occasioned the general war which is often mentioned in the Puranas (see PURANA), and was celebrated by the poets of the West as the basis of the Grecian mythology: I mean that between the gods led by Jupiter, and the giants, or sons of the earth, or, in other words, between the followers of Iwara (see ISWARA) and the Yonijas, or men produced, as they asserted, by Prithu, a form of Vishnu (see PRITHU and VISHNU); for Nonnus (Dionys. b. xxiv. v. 241.) expressly declares, that the war in question arose between the partisans of Jupiter and those who acknowledged no other deities than water and earth. According to both Nonnus and the Hindoo mythologists, it began in India, whence it was spread over the whole globe, and all mankind appear to have borne a part in it.

"These religious and physiological contests were disguised in Egypt and India under a veil of the wildest allegories and emblems. On the banks of the Nile, Osiris was torn in pieces; and on those of the Ganges, the limbs of his consort Isis, or Sati, (see OSIRIS, ISIS, ISI, and SATI,) were scattered over the world, giving names to the places where they fell, and where they are still superstitiously worshipped. In Sanskrit books, we find the Grecian story concerning the wanderings of Bacchus; for Iswara, having been mutilated through the imprecation of some offended Munis, (see MUNI and SAMI-DEVI,) rambled over the whole earth, bewailing his misfortune; while Isis wandered also through the world singing mournful ditties in a state of distraction. There is a legend in another book, of which the figurative meaning is more obvious. When Sati, after the close of her exile as the daughter of Daksha, sprang again to life in the character of Parvati, or mountain-born, (see MERA and MENA,) she was re-united in marriage to Mahadeva. This divine pair had once a dispute on the comparative influence of sexes in producing animated beings, and each resolved, by mutual agreement, to create apart a new race of men. The race produced by Mahadeva was very numerous, and devoted themselves exclusively to the worship of the male deity; but their intellects were dull, their bodies feeble, and their complexions of different hues. Parvati had at the same time created a multitude of human

beings, who adored the female power only. These were well-shaped, with sweet aspects, and fine complexions. A furious contest ensued between these Lingancitas and Yonijas: the former flood their ground pretty well at first, but were in the end defeated, and shamefully routed in the battle, through the potency of the sacred Yoni. Mahadeva enraged was about to destroy them by the fire of his eye: but Parvati interposed; and to appease him, made use of the same artifice that Baubo did to put Ceres into good humour, and shewed him the prototype of the Lotos. Mahadeva smiled, and relented on condition that the Yonijas should instantly leave the country.

"It is evident that this strange tale was invented to establish the opinion of the Yonijancitas, or votaries of Parvati or the Yoni, that the good shape, strength, and courage of animals depend on the superior influence of the female parent, whose powers are only excited and put into action by the male *aura*. But the Lingancitas maintain an opposite doctrine. There is also a sect of Hindoos, by far the most numerous of any, who, attempting to reconcile the two systems, tells us, in their allegorical style, that Parvati and Mahadeva found their concurrence essential to the perfection of their offspring; and that Vishnu, at the request of the goddess, effected a reconciliation between them: hence the *navel* of Vishnu, by which they mean the *as tinca*, is worshipped as one and the same with the sacred Yoni." Wilford, in Af. Ref. vol. iii.

YONIJA, the name of a sect of Hindoos, who worship the hieroglyphic of Parvati, called *Yoni*; which see.

YONKERS, in *Geography*, a post-township of the state of New York, in West Chester county, on the E. bank of the Hudson, above New York island, 20 miles N. of New York, extending near eight miles along the Hudson, and having a medial breadth of near three miles. The surface is broken, but the lands are cultivated and productive. In 1810 the whole population consisted of 1365 persons, with 93 electors, and 204 taxable inhabitants.

YONNE, a river of France, which rises about four miles S. from Château-Chinon, in the department of the Nievre, passes by or near to Monceaux, Clamecy, Coulanges, Cravant, Auxerre, Joigny, Villeneuve, Sens, Pont sur Yonne, &c. and joins the Seine at Montereau.

YONNE, one of the nine departments of the central region of France, formerly *Yonne*, E. of Loiret, in N. lat. 47° 50', about 70 miles long, and from 30 to 40 broad, containing 7740 kilometres, or 373 square leagues, and 333,278 inhabitants; bounded on the N.E. by the department of the Aube, and on the S.E. by the department of the Côte d'Or, on the S. by that of the Nievre, on the W. by that of the Loiret, and on the N.W. by that of the Seine and Marne. The river Yonne, from which it receives its name, crosses it from S.E. to N.W. It is formed of the Auxerrois, formerly reckoned a part of Burgundy. Its capital is Auxerre. It is divided into five circles, or districts, 34 cantons, and 484 communes. The circles are, Sens, comprehending 57,285 inhabitants; Joigny, 81,933; Auxerre, 103,882; Tonnerre, 47,394; and Avallon, 42,784. According to Hauffenratz, its extent in French leagues is 29 in length, and 25 in breadth: its circles are 7, its cantons 69, and its population consists of 364,969 persons. In the 11th year of the French era, the total of its contributions was 3,093,023 fr.; and its expenses, administration, judiciary, and for public instruction, were 297,935 fr. 66 cents. The soil is various; it has some dry and indifferently fertile tracts, diversified with little hills; the western part is of a clayey soil, covered with woods and pools:

pools: the cantons to the S. and E. are planted with vineyards; and the northern district is tolerably cultivated. The department, in general, is fertile, producing grain in abundance, with wine, fruits, and excellent pastures.

YOO L ISLANDS, a cluster of small islands in the Pacific ocean, so called by captain Forreſt, in the year 1774. In 1788 they were by Mr. Meers called Tattee islands.

YOO-MIOU, a large town of the Birman empire, ſituated on a ſmall river, which enters the Irawaddy at a place called Yoo-wa. An extenſive tract of country is inhabited by a people called Yoo, who are ſaid to be exceedingly ugly, having protuberant bellies, and white teeth. Theſe Yooſ are ſubjects of the Birman ſtates, and obſerve the ſame religious worſhip. They ſpeak the language of Tavay, which is merely a provincial dialect of the Birman tongue. Symes's Embaſſy to Ava, vol. ii.

YOPA, a town of Mexico, in the province of Culiacan; 100 miles E.N.E. of Culiacan.

YOPAS, LAS, or *Yopez*, a river of Mexico, which riſes in Tlaſcala, and runs into the Pacific ocean, N. lat. 17° 10'.

YO-PING, a town of Corea; 33 miles S.W. of King-ki-tao.—Alfo, a town of Corea; 28 miles S.S.E. of Tin.

YORK, the *Eboracum* of the Romans, is the capital of the great county to which it gives name, the ſee of an archbiſhop, who is primate and metropolitan of England, and the ſecond city in rank in the kingdom. It is of unqueſtionable antiquity, and eminently diſtinguiſhed in Engliſh hiſtory by the important political, eccleſiaſtical, and military tranſactions which have occurred within its walls, or with which it has been in other ways intimately connected. Seated in the midſt of a vaſt plain, by the ſide of a river which was navigable for the largeſt ſhips of ancient times, and too remote from the open ſea to be immediately expoſed to predatory inſaſion, York muſt have early attracted the attention and become the favourite abode of the chiefs of the northern ſtates, and of their ſucceſſful invaders from foreign lands. Eboracum was accordingly ſelected by Roman emperors and commanders as a principal reſidence during their protracted conſtits with the ungovernable inhabitants of the northern parts of Britain. The metropolis of a ſhire unparalleled in the kingdom for extent, population, and productions, York is placed at the point of junction, although independent of them all, of the three ridings or diſtricts into which the ſhire is ſubdivided. The cathedral is ſituated in N. lat. 53° 58', and in W. long. from Greenwich 1° 7'. The city is diſtant, by the ſhorteſt roads, from London, N. by W. 108 miles; from Edinburgh, S.S.E. 201 miles; from Durham, S. by E. 67 miles; from Hull, W.N.W. 38 miles; and from Liverpool, E.N.E. 100 miles. The neareſt point of the ſea-coaſt on the E. is at Bridlington bay, diſtant 33 miles, and on the W. at Lancaſter 90 miles. The poſition of the city is central, with reſpect to both the limits of the county, and the great body of the population, induſtry, and commerce, by which it is diſtinguiſhed. The ancient ſtation of Eboracum was confined between the river Oufe on the W. and the collateral ſtream, the Fofs, on the E., which falls into the Oufe at the ſouthern extremity of the old city. In later times, however, the limits were extended conſiderably on the oppoſite ſides of both rivers. Such a poſition, defended on three ſides by rivers and marſhes, and acceſſible by an enemy on the N. ſide alone, although in the midſt of a plain, but conſequently overlooked by no neighbouring eminence, would, even in the modern art of war, be ſuſceptible of powerful defence: in ancient times it might have been rendered

nearly impregnable. In conſtructing the walls, and laying down the ſtreets, on ground previously occupied by their camps, it was the practice of the Romans to preferve as much as poſſible the form and diſtribution of the prior intrenchment. Of this practice frequent inſtances are found in Britain, as well as in Gaul, and other parts of the continent. The ſame, notwithstanding the many changes to which the city has been ſubjected, may ſtill be traced in York, where evident remains of Roman architecture are yet preferred, and where monuments of antiquity of various claſſes have often been diſcovered.

In its preſent ſtate, the plan of York forms an irregular pentagon, extending from S. to N. about 1340 yards, and from W. to E. about 1360 yards: the area within the walls is therefore about 300 acres. It is divided into four wards, which take their names from the four gates. Bootham-gate-ward, in the N.W., contains three pariſhes; Micklegate-ward, on the W. ſide of the Oufe, contains ſix pariſhes; Monk-ward, in the N.E., five pariſhes; and Walmgate-ward, on the S.E., ſeven pariſhes. But the cloſe of the cathedral is not included in any ward. Some of theſe pariſhes extend beyond the walls; and the two churches of St. Lawrence and St. Maurice, ſituated on the outside of the city, are ſtill commonly reckoned to belong to it. The number of churches, excluſive of the cathedral, is therefore twenty-three. In former times they amounted to forty-five. Although no regular plan can now be traced in the diſtribution of the ſtreets, yet ſome of them are of reſpectable appearance, having of late years been much improved by widening and paving; and new and handſome buildings, public and private, have been erected. The river Fofs, long a piece of ſtagnated water, has again been rendered navigable, and now materially contributes to the ornament of the city as well as to the health of the inhabitants.

York, ſtill inhabited by many genteel families, maintains its importance in no inconfiderable degree; but in point of population and wealth, it has been far excelled by many manufacturing and trading towns in the county, of comparatively modern foundation. According to the reports of the population of the kingdom in 1811, the inhabitants of York were then only 18,217, and the houſes 2743.

Civil Hiſtory.—York, under its romanized name, *Eboracum*, early appears in Britiſh hiſtory. In the year 208, the emperor Severus, with his ſons Caracalla and Geta, viſited Britain; and returning from an expedition againſt the northern inſurgents in the following year, Severus reſided at Eboracum, while his troops were employed in conſtructing acroſs the iſthmus, between the mouths of the Eden and the Tyne, the great wall of defence ſtill known by his name. In this enterpriſe, he followed the example and completed the fortification of his predeceſſor Hadrian, which had been formed in the year 121. While Severus's great work was in progress, the emperor died at York in 210; and his ſucceſſor Caracalla, more intent on the deſtruction of his en- vied brother Geta than on the enlargement or the preſervation of the Roman dominion in Britain, ſoon afterwards returned to the continent. During his reſidence in York, Severus ſtruck money, on which he ſtyled himſelf *Britannicus*; and alſo iſſued a decree reſpecting the recovery of ſlaves, which decree is ſtill preferred in the Roman code, dated at Eboracum, on the 3d of the nones of May, in the conſulate of Fauſtinus and Rufus, correſponding to the year A.D. 209.

Turning his arms againſt the Caledonians, and other Britons, who ſtruggled for freedom in the north, Conſtantius fixed his head-quarters in York, and there ended his life in 306. York was alſo the ſcene of the inauguration of his ſon

son and successor Constantine, who, learning in Asia the indisposition of his father, hastened to York, where he arrived in time to receive his last instructions; and was there proclaimed emperor by the army.

Among the towns specified in the geography of Ptolemy, the Itinerary of Antoninus, and the much later work of Richard of Cirencester, Eboracum is ranked first as a colony, and afterwards as a municipal town. As a colony, or settlement of veteran troops, the inhabitants were citizens of Rome, and governed by the laws of the state. When advanced to the highest station, that of municipium, the inhabitants retaining the privileges of Roman citizens were no longer under those particular laws, but invested with the power of self-government, under magistrates of their own appointment. Besides Eboracum, Britain contained but one other municipal town, Verulamium. In the list of Roman troops stationed in York, the sixth legion, called the victorious, appears to have been there for three successive centuries, down to 446, when the Romans finally renounced all dominion in Britain. The British name of York is lost; but although softened into Eboracum by the Romans, and by their colonies, who copied from them, traces of the original may still be perceived in the Kair-Ebrauc of Nennius and Henry of Huntingdon, and in the Cair-Effroc, or Efrog, of the Welsh. In British compound appellations of places, the descriptive part precedes the proper name: in the language of the Saxons a contrary mode prevailed. Hence Cair-Effroc was by them converted into Efrog-wyc, and Yevor-wyc, from which the present name of York seems to be derived.

York was the capital of Deira, one of the districts into which the Provincia Maxima of the Romans, or the county of Northumberland, was divided; and there, in the beginning of the seventh century, resided Edwyn, who re-united those kingdoms, and acquired the principal ascendancy over Saxon-England. To this prince are ascribed the construction of the castle, and the foundation of the city of Edinburgh (Edwyn's burgh), now the capital of Scotland. He also founded a cathedral in York; but in 633 he fell in the defence of his dominions, against the combined attack of the Saxons of Mercia and the Britons of Wales. Under Oswald, who came to the crown in the following year, Northumberland was again united into one kingdom; and afterwards governed by the celebrated Egbert, who, in 827, out of the Saxon heptarchy, formed the great kingdom of England. After a long series of disasters from Danish invasion, and the internal disorders of the kingdom, York was exposed to utter destruction from the memorable expedition of Harold Hardrad, king of Norway. On the death of Harold of England, an unsuccessful attempt was made by the people of York to place Edgar Atheling on the throne. For this step, William of Normandy besieged the city in 1070, which, after many months, was compelled by famine to surrender. The conqueror inflicted the most horrible vengeance on the inhabitants, the surrounding country was laid waste, and castles were erected within the walls, to keep the conquered citizens in subjection. With the exception of the contests between the metropolitans of York and Canterbury, little is recorded of the former city until 1137, when the cathedral church, thirty-nine parish-churches, and the greater part of the houses, were accidentally burnt down. About 1160, one of the first parliaments of England was held there by Henry II.; and in the reign of his successor, Richard I., in 1190, occurred the horrible massacre of the Jews, which was perpetrated and accompanied with circumstances of peculiar atrocity. In 1299, the courts of justice were removed from London to York by Edward I. during

his expeditions against Scotland. In his reign this city was classed among the sea-ports of England, and required to furnish one ship for his use. In the languinary contests between the houses of York and Lancaster, the former city naturally espoused the cause of the white rose; and in 1483, Richard III. was a second time crowned in the cathedral. The year 1509 was distinguished by the establishment of a printing-press in the minister-yard of York, near the place where the royal presses were afterwards erected in 1642, while king Charles resided in the city. Nothing of moment relative to York is afterwards recorded until the 31st year of Henry VIII., when commissioners were appointed there to conduct the suppression of the northern monasteries. Adhering to the royal cause, the city was, in 1644, besieged by the parliamentary forces under sir Thomas Fairfax. But on the approach of prince Rupert, the siege was raised; and on the 2d of July, the important battle of Marston-moor, about five miles off, was fought, in which the royal party was completely defeated. Returning to the siege, Fairfax, at the end of six weeks, obtained possession of the city, on most honourable terms for the garrison and inhabitants. Notwithstanding the zeal for the royal cause manifested by the citizens of York, their charter was suppressed by Charles II., and never restored. A new charter, however, confirming all the former rights of the city, was granted by his successor James II. in 1685. Down to the 30th of July, 1688, the inhabitants of York continued to express the most determined attachment to James; and on that day, the mayor, aldermen, and commons, congratulated him, in the most energetic terms, on the birth of a young prince.

Civil Government.—The government of York is vested in a mayor, who, like the mayors of London and Dublin, and the provost of Edinburgh, is authorized by the act of Richard II. to assume the title of lord; a recorder, two city-council, twelve aldermen, two sheriffs, seventy-two common-council-men, and six chamberlains. What is styled the privy-council, or the upper house, consists of the lord-mayor, aldermen, and sheriffs, together with those citizens who have passed the office of sheriff. This body, whatever may be its number, is usually called the twenty-four. The mayor, whose office ceases on the 3d of February, is chosen annually from those aldermen who have not borne that office twice, nor within the six preceding years; and during his mayoralty takes precedence of all persons within his jurisdiction. York was early distinguished among the cities of England: in the Domesday-book it appears to be exempted from the payment of geld, except when the same is paid by London and Winchester, and from paying reliefs. In 1396 king Richard appointed two sheriffs, instead of three bailiffs, for the government of the city, which was then constituted a county within itself. The earliest charters of York now preserved are, one granted in 1199, and another by Henry III., who died in 1272: but both recite preceding charters of Richard I., Henry I., and Henry II. Representatives in parliament for the city of York appear in the summons and returns of the 23d of Edward I. For the parliament called to assemble at Shrewsbury, on the 30th of September 1283, which was but the 11th year of Edward, two representatives were summoned from a number of cities and towns, among which York stands the fourth in order; those before it being London, Winchester, and Newcastle-upon-Tyne. Under the jurisdiction of the lord-mayor, aldermen, and sheriffs, besides the city, is a considerable district on the W. of the river Ouse, called the Ainstey, in ancient writings, Ancesty; but its origin and import are now unknown. This tract was once a hundred or wapentake of the West Riding of Yorkshire; but in the 27th year

year of Henry VI. it was annexed to the jurisdiction of the magistrates of York, and has ever since been comprehended in the county of the city of York. The whole district was anciently a forest, but laid open in the reigns of Richard I. and John: it contains 22 parishes subdivided into a number of townships; the inhabitants of the whole amounting, in 1811, to 8205 persons. In all parliamentary assessments the city is called on for three-fifths of the amount, and the Ainstley for two-fifths. Doubts having long been entertained whether the inhabitants of this district could vote for the representatives of Yorkshire in parliament, a decision was obtained in the house of commons in 1735, declaring, "that the persons whose freeholds lie within that part of the county of the city of York, which is commonly called the Ainstley, have a right to vote for knights of the shire for the county of York."

Ecclesiastical History.—The earliest notice respecting the recognized establishment of Christianity in Eboracum, or York, exists in the list of bishops, or pastors, who composed the synod or council of Arles, now Arles, in the south of France, about A.D. 314. The bishops who then appeared on the part of the British church were, Eborius de civitate Eboracensi, Restitutus de civitate Lindinensi, and Adelfius de civitate Colonia Londinenium. By the retreat of the Romans in the middle of the 5th century, and the subsequent overwhelming invasions of the Saxons, Christianity was almost entirely suppressed in the northern parts of the kingdom. At last, about 628, Edwin, king of Northumbria, having married Ethelburga, the sister of Ebald, the converted king of Kent, was, by her persuasion, aided by Paulinus, who attended her to York, induced also to embrace the Christian religion. Paulinus was consequently publicly appointed bishop, or, as some say, archbishop of the renovated church of York. The appointment was confirmed, and the new prelate formally invested with the ensigns of his office, by pope Honorius. In former times, jealousies and contentions occasionally took place between the metropolitans of York and Canterbury; to appease which it was often necessary to appeal to the pope. Under the archbishop of York are placed the bishops of Durham, Chester, Carlisle, and the Isle of Mann; and he is styled in general primate and metropolitan of England: but the archbishop of Canterbury assumes the same titles over all England. At the coronation the latter crowns the king; but the queen has that ceremony performed on her by the archbishop of York. By the removal of the seat of government to the southern parts of the kingdom, and particularly after the Norman Conquest, the prelates of Canterbury and Winchester, situated near the throne, soon acquired an ascendancy over their brothers of York in political favour and power. Among the latter, however, were many men of eminence in the history of the church and of the state. Wilfrid, appointed in 669, founded the celebrated monastery of Ripon. Egbert, the brother of Eadbert, king of Northumberland, was the patron of Alcuin, the enlightened secretary of Charlemagne. In 930 Wulfstan was deprived for aiding Anlof, the Danish king of Northumberland, against Edred of England. Aldred, who succeeded in 1060, was the last prelate of the Saxon race; for dying in 1070, he was succeeded by Thomas, a Norman. Gerard, appointed in 1100, as well as his predecessor, refused obedience to the see of Canterbury; but pontifical authority compelled him to submit. Obedience was again denied by Thurstan, who had been appointed in 1114; but at last he retired to a monastery. In 1153 succeeded William, afterwards canonized. Roger, suspected of being privy to the death of Becket, was acquitted on his oath of purgation. In 1190 the see was filled by Geoffrey

Plantagenet, son of Henry II. and the Fair Rosamond. His successor, Walter de Grey, is said to have transmitted a prodigious sum to Rome for his installation; but for this apparent simony he atoned by purchasing the manor of Thorpe for the country-residence of the archbishops of York, and by contributing materially to the erection of the cathedral. While the see was occupied by John Thoresby, appointed in 1352, in order to remove the contentions between the two archbishops, pope Innocent VI. established the distinction before-mentioned in the metropolitan dignity. Richard Scroope, who succeeded to the see in 1398, was, in 1405, beleaguered for the active part he took in opposition to Henry IV. after the murder of Richard II., who, on various occasions, had shewn a particular favour for York. The fifty-second prelate, appointed in 1464, was George Neville, brother of the famous earl of Warwick, and distinguished by the misfortunes of his latter years, no less than by the unbounded magnificence of his installation. Christopher Bainbridge, appointed in 1508, and ambassador to Rome, was created a cardinal; but was soon after poisoned by an Italian priest, his steward. His successor, in 1514, was the celebrated cardinal Wolsey. By the exertions of archbishop Heath, appointed in 1555, the fee recovered a great part of the revenues it now enjoys, which had been alienated by the arbitrary and avaricious measures of Henry VIII. As a Roman Catholic, he was deprived of his dignities by Elizabeth, who, however, respected his merits, and allowed him to retire to his estate at Cobham. In 1641 the see was filled by John Williams, who, after warmly espousing the royal cause, openly joined the parliament. After him the see remained vacant for ten years until 1660, when, on the restoration of Charles II., it was conferred on archbishop Frewen. Archbishop Dolben, who succeeded Richard Sterne, was an ensign in the army in his youth, and bled in the royal cause at Marston-moor: he died in 1688. The last prelate was Dr. Markham, who had been head-master of Westminster-school, and preceptor to the prince of Wales. Dying in 1808, he was succeeded by the present archbishop, the honourable Edward Vernon.

Antiquities.—That Eboracum possessed temples, palaces, theatres, and the other public edifices with which the politic Romans were in the habit of adorning the principal, and even in some cases the minor cities within their dominions, cannot be doubted; but all such structures have long disappeared. The most remarkable monument of Roman occupation now to be seen is what is called the multangular tower, being a polygon forming the N.W. angle of the Roman wall, near the N.E. bank of the Ouse. The lower part of this tower is faced with rows of regularly squared stones, separated at broad intervals by layers of flat bricks. The upper part of the tower, pierced with loop-holes, is of much later date. Various Roman inscriptions have been and continue to be discovered in York: some are mentioned by Camden, who was the first to record them. In digging for a cellar, in the beginning of the last century, in what is called the manor, or the ruins of St. Mary's abbey, on the outside of Bootham-bar, was found a small bust in bronze. In the environs of the city, particularly on the London road, which follows the course of the ancient Roman way, sepulchral urns of various kinds have been discovered. Coins, seals, fibulæ, and many other relics of Roman antiquity, are abundantly found within and around the city. The coins bear the names of all the emperors, from Augustus to Gratian. In 1807 a small vault of Roman construction was discovered, four feet below the surface, on the outside of Micklegate-bar, containing a stone coffin, with a human skeleton entire, a lacrymatory, &c. In 1813 two large

stone coffins were found without Bootham-bar; and are now preserved in the cathedral. In 1814 was laid open a beautiful tessellated pavement, within Micklegate-bar, but without the Roman town; but unfortunately a part of it only was preserved: this was the first ever found in York. The walls of the city, which probably succeeded to the Roman fortifications, and which are now in rapid and disgraceful decay, still retain sufficient evidences of their ancient strength and importance. When they were erected is now unknown; but their construction on the Roman foundations is generally ascribed to Edward I., about 1280: in the time of Henry VIII. they were in complete repair. The oldest part of the present walls appears to be that adjoining to Walmgate-bar, at the S.E. corner of the city, on the road to Hull, where the remains of the Red tower are still visible. During the last siege of York, in the civil wars, by sir Thomas Fairfax, in 1644, these walls were so shattered as to require three years to repair them: but since that period they have been shamefully neglected by those whose duty it is to preserve them.

York is distinguished among the cities of England for its ancient gates, or bars, as they are termed. Of these, Micklegate-bar, on the S.W. side of the present city, under which is the road from London, is the most remarkable. It consists of a lofty square embattled tower, with loop-holes, &c. and guarded by an adorned work, with bastion-turrets, &c. Bootham-bar, at the N. entrance of the city, not far from the Roman tower, is almost wholly constructed of materials formerly employed in Roman buildings. Monk-bar, on the N.E., and the Walmgate-bar on the S.E., seem to be of equal date, and were probably erected by Edward III. The whole circuit of the ancient walls is nearly two miles and three-quarters.

Castle: Clifford's Tower.—Nearly at the junction of the Ouse and the Foss, on an eminence, is the site of the ancient castle, accessible only from the city on the N., and strengthened on the other sides by the Foss, carried round it in a deep moat. Prior to the Norman Conquest, York possessed a castle, by some supposed to have stood on the W. side of the Ouse. It is, however, much more probable, that the principal fortrefs occupied the position here described, on which William of Normandy erected his castle, which was restored by Richard III. Ceasing to be regarded as a place of strength, it was converted into the prison for the county of York: but becoming ruinous, the whole was, in 1701, taken down, and the present grand structures, still retaining, although very incongruously, the original name, were erected. Within the inclosure of the ancient castle on the N.W. is a high mount, surrounded by a deep ditch, rising 90 feet above the river Ouse, and 30 above the site of the castle. On the summit stands Clifford's tower, consisting of four segments of circles joined together, and so called, it is said, from the first governor, after its erection by William the Conqueror, to whose castle it served as the keep. In the time of Henry VIII. this tower was in a ruinous state: but on the commencement of the disorders in the reign of Charles I., it was repaired and fortified by the earl of Cumberland, who mounted some pieces of artillery on the platform. In the year 1684, the powder-magazine within the tower exploded, and the building was reduced to its external walls, as now existing. Corresponding to Clifford's tower, on the W. side of the Ouse, is another mount, called the Old Baile, or *Vetus Ballium*; also the site of an ancient fortrefs.

Public Buildings.—At the head of the public edifices of York is necessarily placed the venerable minster, or cathedral, which, considered in its totality, is unparalleled in

England. The earliest erection of a *stone* edifice for the service of the Christian religion in York is always ascribed to Edwin, king of the Northumbrians. This church was founded about A.D. 628; but it was completed by bishop Wilfrid, after 669, who covered the roof with lead, and filled the windows with glass. This last invaluable substance must have been imported from the continent; for it was not till 674 that glass-makers were first introduced into England by Benedict Biscop, to glaze the windows of his new monastery at Bishop-Wearmouth. That the cathedral of York suffered with the other parts of the city by the ravages of the Danes in 867 is most probable: but it is not noticed until 1069, when it was destroyed, with a great part of the city, in a conflagration occasioned by the Norman garrison, when attacked by the united Danes and Northumbrians. To punish the refractory people of the city and vicinity, William of Normandy expelled the ecclesiastics, and seized the revenues of the see: but these were soon restored, and his chaplain and treasurer, Thomas, a Norman, was promoted to the archbishopric. By this prelate the cathedral was rebuilt in a magnificent style; but in 1137 it was again destroyed by fire, together with the abbey of St. Mary, and 39 parish-churches. Having for a number of years lain in ruins, archbishop Roger, the strenuous opponent of Becket of Canterbury, began in 1171 to rebuild the choir with its crypt, which he lived to finish. In 1227, his successor, Walter de Grey, erected the transept, with the exception of the N. part, which was the work of John le Romaine, the treasurer, who also raised a central steeple in 1260. In 1291, the son of the preceding being advanced to the see, commenced the nave, which, together with the two noble western towers, was completed by archbishop William le Melton. In 1361, the present beautiful choir was commenced by archbishop Thoreby, who contributed largely to defray the charges of the work. More money having been collected than was required, the surplus was, in 1370, employed to construct the present noble central tower, in the place of one erected by John le Romaine. Thus, in the course of 150 years, the cathedral of York was brought into a form nearly as it now appears. It is a grand and interesting edifice; and consists of a nave with side aisles, a large and lofty transept with aisles, a choir with aisles, and a large space east of the choir, called the lady-chapel, with aisles. Beneath the altar is a crypt; on the south side are three apartments called vestries and treasury; and at the end of the north transept is a fine chapter-house, with a corresponding vestibule. The west end is adorned by two elegantly ornamented towers, whilst another, of larger dimensions, rises at the centre of the transept. All these parts of the church are on a large and magnificent scale; and though not in a uniform style, yet the nave and choir are of corresponding height and width, and very similar in their windows, columns, and other members. The W. front is more richly adorned than any other part of the edifice. Its two towers diminish in dimensions as they ascend, and have been ornamented with several statues, of which now only very few remain. Each tower is surmounted by eight pinnacles; and in the south tower is a set of celebrated bells. In the front are three entrances; that in the centre is divided into two by a pillar. The entire length of the cathedral is above 524 feet; that of the nave, from the west end to the screen at the entrance of the choir, is 250 feet; the length of the choir to the altar-screen 150 feet; and that of the lady-chapel, at the east end, 65 feet. The transept is in length 222 feet. The breadth of the nave, with its side aisles, is 103 feet; that of the nave itself being 63. In the centre of the nave the height to the roof

is 91½ feet; in the transept 103 feet; and in the choir 101 feet. The elevation of the central tower or lantern is 213 feet; that of the towers at the W. end 196 feet. The great windows which occupy the principal part of the W. and E. ends of the church are particularly beautiful. The great E. window, especially, is of uncommon dimensions and richness. It was executed about 1405, at the expence of the dean and chapter; and the glass painted, &c. by John Thornton, of Coventry, glazier, who engaged to finish it in three years, and for which he was paid four shillings *per week*. Spacious, lofty, and light, the interior of this cathedral has a most imposing effect. For although the choir be separated from the body of the building by a screen surmounted by the organ, still from the W. end the eye ranges over all, quite to the great terminating window in the E. The nave consists of a double range of eight lofty pointed arches, supported by slender clustered columns. A similar arrangement prevails in the choir; but the transept is of a different age, style, and character, to all the other parts of the church.

Great labour has been bestowed in the carving of the stalls of the choir, which are of oak. The screen behind the altar is stone, divided into eight pointed arches, the upper parts of which are perforated and glazed. At the entrance of the choir is a very elaborate screen of tabernacle work, perhaps of the time of Henry VI. It is covered with niches, canopies, pediments, pinnacles, &c. and contains statues of fifteen English monarchs; *i. e.* eight on one side of the entrance, and seven on the other side. The whole has been of late years suitably repaired. The central tower, or lantern, as it is usually called, is supported by four lofty arches resting on strong massive clustered piers.

Among the monuments of prelates and other eminent persons preserved within the cathedral of York, is distinguished that of archbishop Walter Grey in the fourth transept. It exhibits his effigy in his pontificals, covered by a magnificent canopy, supported by slender pillars. The whole was enclosed with a handsome railing by the late Dr. Markham. But the most elegant of all is the monument of archbishop Bowet, appointed in 1423, of great height, and in the most florid style of the pointed architecture. A full-length statue, with emblems and an inscription, commemorates the late Sir George Saville. Attached to the fourth side of the choir is a range of low buildings, styled the vestries; in one of which are preserved sundry emblems of the ancient metropolitan dignity of York cathedral. Among these is a famous antique horn, as it is termed, although formed out of an elephant's tooth, by the possession of which the church holds lands of great value, said to have been granted by Ulphus, a Saxon prince of Deira. In the same place is preserved the silver pastoral staff, presented by Catharine of Portugal, dowager of Charles II., to her confessor, who had been appointed popish archbishop by James II. in 1687. Adjoining to the S.W. angle of the transept was a small building, formerly used as a library. A library for the use of the ecclesiastics of the cathedral is believed to have been founded by Egbert the archbishop in 740, and his successor Albert; but the whole was consumed by fire in 1060. By this misfortune no small loss was sustained by the lovers of learning; for according to certain writings of Alcuin, the secretary of Charlemagne, many valuable classic and other works were contained in it. To supply in some measure its place, another library was collected by archbishop Thomas, the Norman; but that also was destroyed by the flames in 1137. From this period, the cathedral is not known to have been furnished with many books until the private collection, consisting of upwards of 3000 volumes, of

archbishop Matthew, was bestowed on it by his relic in the beginning of the 17th century. By various subsequent bequests, presents, and purchases, a large collection of valuable books and manuscripts has been formed, and placed in what was formerly the chapel of the archiepiscopal palace, on the north side of the cathedral. This building has been lately repaired in a style suitable to that of the church, and commodiously adapted to its present destination. Connected by a short passage or vestibule with the N.E. angle of the transept of the cathedral is the chapter-house, an octagon room, 63 feet in diameter, and nearly 68 in height. This building differs from many others of the same kind, in having no central pillar to support the roof: but the pressure of the arched roof upon the walls is effectually counteracted by buttresses at each external angle. From the similarity of the style of building with that of the nave of the cathedral, founded in 1291, the chapter-house is supposed to have been erected about that time. The buildings belonging to the cathedral were formerly separated from the city by walls; and some remains of the gates of communication may still be discovered. Of those buildings, the principal was the archiepiscopal palace, situated on the north of the church. It was erected by the first Norman prelate appointed in 1070; but after a lapse of about 500 years, the great hall was taken down by the Protestant archbishop Young, for the sake, it is said, of the lead on the roof. Since that time other parts of the palace have been leased out. In former times to the see of York belonged various places of residence; but now that of Bishopthorpe alone is occupied. This is agreeably situated on the side of the river Ouse, about three miles south-west from the city. It was purchased and appropriated to the see by archbishop Walter de Grey, in the early part of the 13th century; since whose time it has undergone many important alterations and improvements. The principal front and the vestibule are in the pointed style of architecture, and in the interior are several spacious and elegant apartments, besides the chapel and library. In the minter-yard still remains the residence of the dean of the cathedral, a spacious and convenient edifice of respectable appearance.

Of the parish-churches in York, that of St. Margaret in the fourth-east quarter of the city is remarkable for the porch attached to it, but which is of much higher antiquity than any other part of the edifice. It was removed from the church of St. Nicholas, formerly situated without Walmgate-bar, but ruined during the siege of York in 1644. The arch of the porch is flemicircular, and exhibits alternately the signs of the zodiac and the emblems of the months. The churches of St. Denys and St. Lawrence have also an appearance of considerable antiquity. Next to the cathedral, the church of St. Michael-le-Belfrey is the largest and the most regular in the city, supported by light pillars and pointed arches. The present building was erected on the removal of the former in 1535. The church of All Saints, on the pavement, is distinguished by its open octangular turret, erected on a square tower, in which, according to tradition, a large lamp was suspended in the night, to guide travellers over the broad forest of Galtres, which extended on the north and east of the city. York contains places of meeting for various classes of dissenters from the established church; that for the Society of Friends, lately erected, is large and commodious. A handsome chapel for the use of the Roman Catholics was built in 1782.

Of the numerous religious establishments formerly existing in and near York many vestiges still remain. Of these,

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the principal was St. Mary's-abbey, situated on the bank of the river Oufe, on the outside of the city wall. The foundation of the monastery is of uncertain date; but the church, of which some considerable ruins still remain, was rebuilt in 1270. Having fallen to decay after the general suppression of religious houses, Henry VIII. ordered a palace to be erected out of the ruins, for the residence of the lord-president of the north of England, to be designated the 'king's manor.' This was enlarged by James I. Previously to the Revolution it became an object of popular outrage: but some years afterwards the king's Mint was established in it, and much gold and silver, distinguished by the initial letter Y, was struck there for William III. The site of the abbey and the manor have long been leased from the crown by lord Grantham and his predecessors. Connected with the religious system of former times, it may be noticed, that adjoining to the walls of York, immediately without Micklegate-bar on the London road, is an establishment called the Nunnery. The building was originally acquired in 1686, as a place of education and living for young ladies of Roman Catholic families. The establishment at present consists of the superior and twenty assistants, who wear the dress and conform to the regulations of nuns in Catholic countries, with twelve lay-sisters, and a chaplain. From sixty to seventy boarders are usually accommodated in the institution.

The Guild-hall and the Mansion-house are situated near the river Oufe, in the north-west quarter of the city. The hall, built in 1446, is a noble room, ninety-six feet long, forty-five broad, and twenty-nine feet six inches high. In it are held the law-courts and the courts of municipal justice. The Mansion-house was erected in 1725, and contains every necessary accommodation for the lord-mayor. In the same quarter of the city are the assembly-rooms, the theatre, the subscription library, the principal hotels, &c. As a fortress, York castle has long ceased to be of importance: it is now occupied by several structures. That on the W. side of the area is the county-hall, rebuilt in 1777, in which the assizes are held, and other county business is transacted. The centre building is the prison for debtors and criminals: the third building on the E. contains the record-office, and various apartments necessary for the transaction of the business of the county. Of all these buildings it is but justice to say, that in their construction external elegance and taste have been properly combined with a due attention to their several destinations. The arrangement and management of the prisons have been frequently the subject of commendation. The new city-goal, an extensive stone structure near the Old Baile, on the west side of the river Oufe, and the house of correction, are also deserving of attention.

The charitable establishments for the poor and the sick in York are very numerous, and well conducted. Among these, the county-hospital and the city-dispensary are highly commendable. Schools for the education of youth of both sexes are not wanting in York. In 1647 a petition was presented to the crown from the inhabitants of the city and the county, and from other parts of the north, for the establishment of an university in York: but the unsettled state of the affairs of the kingdom then prevented due consideration of the request; nor has it since been renewed; although, for various important reasons, York seems peculiarly adapted for a place of literary and scientific retirement and study. A seminary or college for the education of ministers and lay-gentlemen among Protestant dissenters, which formerly subsisted at Manchester under the successive care of the Rev. Dr. Barnes and Mr. Walker, and was liberally supported by

voluntary subscription, was on the death of the latter professor removed to York, where it is conducted with great reputation by the Rev. Messrs. Wellbeloved, Kenrick, and Turner.

Bridge.—Communication between the original city of York, and the suburb styled Micklegate-bar on the fourth-west side of the river Oufe, is maintained by a handsome stone bridge, which has lately been erected from the designs and under the direction of Peter Atkinson, esq. of York. In 1154 the bridge was wood: but in 1268 it was probably of stone; for then was founded on it St. William's chapel, in atonement for the death of several persons on the spot in a fray with the people of the town. In 1564 a flood following an intense frost swept away two arches of the bridge, with the houses built on them.

On the south-east side of York, going out by Walmgate-bar, near the village of Hellington, is an establishment for the reception and relief of persons disordered in mind; which has, for some time, been the subject of general approbation. This was called the Retreat, founded by the respectable Society of Friends, and originally intended for members of their class alone. The first idea of this admirable institution was suggested in 1791, by the unfortunate death of one of their society, at a common receptacle for the insane. In 1794 land was purchased, and the building commenced, on a commanding eminence. The general arrangement, management, and system of treatment of the unfortunate patients, have been imitated, as the most perfect of their kind, in various parts of the kingdom and America. See an "Account of the Retreat," 8vo.—Eboracum, or History and Antiquities of York, by Francis Drake, F.R.S. folio, 1736. Description and History of the City and Cathedral of York, 12mo. 3d ed. 1790. Description of York, 12mo. 1816. A Guide to the Cathedral of York, 12mo. 1815, is a rational and judicious vade mecum.

YORK, Custom of. See RATIONABILI parte bonorum.

YORK, in *Geography*, a county of the United States, in the district of Maine, containing 23 towns, and 41,877 inhabitants.

YORK, a district of South Carolina, containing 10,032 inhabitants, including 3164 slaves.

YORK, a county of Pennsylvania, south-west of Susquehanna. It contains 22 townships, and 31,958 inhabitants.

YORK Borough, a town of Pennsylvania, in York county, containing 2847 inhabitants.

YORK, a township of Pennsylvania, in York county, containing 1649 inhabitants.

YORK, a county of Virginia, with 5187 inhabitants, including 2931 slaves.

YORK, a town of United America, in the district of Maine, and county of York, containing 3046 inhabitants; 50 miles N.N.E. of Boston. N. lat. 43° 7'. W. long. 70° 40'.

YORK, a township of Ohio, in the county of Belmont, containing 1349 inhabitants.

YORK, the capital of Upper Canada, situated on the lake Ontario. It is likely to become a city of great importance, as it possesses great facilities for commerce and navigation. It lies in about 43° 35' N. lat., within an excellent harbour of the same name, made by a long peninsula, which embraces a basin of water sufficiently large for containing a considerable fleet. Vessels may ride safely at its entrance during the winter. On the extremity of the peninsula, which is called Gibraltar Point, are erected commodious block-houses and stores commanding the entrance into the harbour. On the main land opposite

YORK.

posite to the Point is the garrison, situated on a point made by the harbour and a small rivulet, which being improved by sluices, affords an easy access for boats to go up to the stores. The barracks being built upon a knoll are well situated for health, and command a delightful prospect of the lake to the west, and the harbour to the east. The government-house has a striking appearance from the lake, and is well calculated for the residence of a governor. Its situation is commanding, about two miles above the garrison, being the head of the harbour. The town is increasing; the society of the place is respectable. The public buildings are designed for the legislative council, house of assembly, and courts of law. The gaol is in a healthy situation. The town is furnished with every convenience, and the market is well supplied with good beef, mutton, venison, fish, &c. The wheat supply is from Montreal: the land around York is in general sandy; but bears good crops of every description. The plan of the town is one mile and a half in length; the streets are tolerably uniform; and the river Don empties itself into the harbour, a little above the town, running through a marsh, which, when drained, will afford excellent meadows. The country round this place is capable of great improvement, and renders it fit for a seat of government. See Boulton's Sketch of Upper Canada, ch. viii.

YORK, a river of Virginia, formed by the union of the North Anna and South Anna, which runs into the Chesapeake, near its mouth.—**Alfo**, a river of America, in the district of Maine, which runs into the sea, a little below York.

YORK Bay, a bay on the fourth-west coast of the island of St. Vincent; 2 miles N.W. of Kingstown bay.—**Alfo**, a bay formed by the union of the East and Hudson's rivers below New York. It communicates with the sea by a channel, called the Narrows.

YORK Fort, a fortrefs at the mouth of Nelson's river, in Hudson's bay. N. lat. 57° 2'. W. long. 92° 46'.

YORK Island, a small island, near the east coast of the island of Antigua; about half a mile N.N.E. of Frier's Head.—**Alfo**, one of the Gallapagos islands, in the Pacific ocean.

YORK Islands, three small islands, in the South Pacific ocean, near York Cape, on the north coast of New Holland.

YORK Minster, a lofty promontory on the coast of Terra del Fuego, so called by captain Cook in 1774. It forms the north-west point of entrance into Christmas sound. S. lat. 55° 26'. W. long. 70° 25'.

YORK Point, a cape in the straits of Magellan. N. lat. 53° 39'. W. long. 73° 32'.

YORK River, a river of America, in the province of Maine, which runs into the Atlantic, N. lat. 43° 7'. W. long. 70° 40'.

YORK Road, a road for ships in the straits of Magellan, near the coast of Patagonia. The only danger of falling into the bay, that is formed by two points in this road, arises from a reef that runs off to about a cable's length from the western point, which once known may be easily avoided. To anchor in this bay, it is safest to bring York Point E.S.E.; Bachelor's river N. by W. half W.; the west point of the bay or reef N.W. half W.; and St. Jerom's found W.N.W. at the distance of half a mile from the shore. There is good watering about a mile up Bachelor's river, and good wooding all round the bay, where the landing also is, in all parts, very good. There is plenty of celery, cranberries, muscels, and limpets, many wild-fowl, and some fish, but not enough to supply a ship's company with a fresh meal. S. lat. 53° 39'. W. long. 73° 52'.

YORK, New, one of the United States of America, situated, according to the statement of Melish, between 40° 33' and 45° N. lat., and 3° 43' E. and 2° 43' W. long. from Washington; extending from N. to S. 198 miles, and from E. to W. 256; and comprehending an area of 46,000 square miles, or 28,440,000 acres. This state is bounded on the N. by lake Ontario and Canada; on the S. by Pennsylvania, New Jersey, and the Atlantic ocean; on the E. by Vermont, Massachusetts, and Connecticut; and on the W. by Upper Canada, lake Erie, Pennsylvania, and New Jersey. This territory, according to Spafford's "Gazetteer of New York," comprises an area of 46,085½ square miles, equal to 29,494,720 acres; but this computation includes all the inland rivers and lakes, one half of lake Champlain, and the St. Lawrence; excluding only all the waters below New York island, and that part of the lakes Ontario and Erie which belong to this state. This statement gives 20.8 persons to a square mile. New York is at present divided into 45 counties, and 452 townships, including four incorporated cities; viz. New York, Albany, Hudson, and Schenectady, as exhibited in the following

Topographical Table.

Counties.	Townships.	Population.	Chief Towns.	
Albany	8	34,661	Albany	9,356
Alleghany	5	1,942	Angelica tp.	439
Broome	6	8,130	Chenango tp.	225
Cattaraugus*	1		Olean tp.	458
Cayuga	10	29,843	Auburn tp.	500
Chatauaque*	2		Chatauaque tp.	1,039
Chenango	14	21,704	Norwich	225
Clinton	5	8,002	Plattsburg tp.	3,112
Columbia	11	32,390	Hudson	4,048
Cortlandt	6	8,869	Homer	350
Delaware	14	20,303	Delhi tp.	2,396
Duchefs	16	51,363	Poughkeepsie	1,800
Essex	11	9,477	Elizabethtown tp.	1,362
Franklin	4	2,617	Ezraville	767
Genesee	10	12,588	Batavia	200
Greene	7	19,536	Catskill	1,000
Herkimer	10	22,046	Herkimer tp.	475
Jefferfon	12	15,140	Watertown	250
King's	6	8,303	Flatbush tp.	1,159
Lewis	7	6,433	Martinburg	150
Madison	11	25,144	Cazenovia	500
Montgomery	15	41,214	Johnstown	605
New York	1	96,373	New York	96,373
Niagara	4	8,971	Buffalo	500
Putnam.*				
Oncida	26	33,792	Utica	1,500
Onondaga	13	25,987	Onondaga	525
Ontario	24	42,032	Canandaigua	685
Orange	11	34,374	Newburgh	2,000
Otsego	21	38,802	Otsego	550
Queen's	6	19,336	Northempstead tp.	2,750
Renssellaer	13	36,309	Troy	2,640
Richmond	4	5,347	Richmond	100
Rockland	4	7,758	Clarkstown tp.	1,996
Saratoga	14	33,147	Saratoga	
Schenectady	4	10,201	Schenectady	2,000
Schoharie	8	18,945	Schoharie	125
Seneca	7	16,609	Ovid tp.	4,535
Steuben	9	7,246	Bath	250
St. Lawrence	12	7,885	Ogdensburg	350

Carry up 372 822,792

Suffolk

YORK.

Counties.	Townships.	Population.	Chief Towns.	
Brought up	372	822,792		
Suffolk	9	21,113	Riverhead tp.	1,711
Sullivan	7	6,108	Thomson tp.	1,300
Tioga	9	7,899	Spencer tp.	3,128
Ulster	13	26,576	Kingston	750
Warren.*				
Washington	21	44,289	Salem	280
West Chester	21	30,272	Bedford tp.	2,374
		452		959,049

* Laid out since the census was taken.

Putnam county was erected in June 1812, from the S. end of Dutchess county, and is formed of the towns of Philips or Philipstown, Carmel, Frederick, Patterton, and South-East. Courts are held in the Baptist meeting-house in the town of Carmel, and this county sends one member to the house of assembly. The towns are, Carmel the chief, including, in 1810, 2020 inhabitants, the electors being 153; Frederick, with 1811 inhabitants, and 98 electors; Patterton, with a population of 1446, and 110 electors; Philips, with 3129 persons, and 165 electors; and South-East, in which the population is 1887, and the number of electors 161.

Warren county was erected from the N.W. extremity of Washington, March 12, 1813. It comprises the towns of Bolton, Caldwell, Chester, Hague, Johnburgh, Luzerne, Queensbury, and Thurman, the last of which is divided into two towns, called Athol and Warrenburgh. The chief town is Caldwell, with a population of 560 persons, and 60 electors; Athol has 443 inhabitants, and its electors are 20; Bolton has 726, and 30 electors; Chester 937, and 120 electors; Hague 398, and 21 electors; Johnburgh 651, and 82 electors; Luzerne 1015, and 85 electors; Queensbury 1948, and 197 electors; and Warrenburgh 887, with 41 electors.

The face of this state exhibits a great variety. To the S.E. its surface is agreeably uneven; in the middle, mountainous; to the N.W. undulating; flat towards the lakes; and hilly towards the southern extremity.

Of the mountains in this state, the chain called Catskill, or Catskill, is the largest and most extensive, and this presents a bifurcation of the Appalachian ridge, which at the Highlands occupy a tract of about 16 miles in width, lying obliquely across the Hudson, and penetrated by that river. These ridges preserving their general direction stretch across Dutchess county, the eastern parts of Columbia and Rensselaer counties, and exhibit some lofty summits. The Taconic mountains are lofty and very rugged, and Hoosack and Williamstown are mountains which deserve the appellation. But the Catberg or Catskill mountains present some summits that are higher than any others of the Appalachian chain, if we except the White-hills in New Hampshire. At the Highlands, the summit of Butter-hill is 1432 feet above the level of the river; that called the Crow's-nest 1330; Bell-hill 1391. About 60 miles N., the Round-top is elevated 3655 feet above the level of the river; the High-peak 3487. These summits are in Windham, Greene county, about 20 miles W. of Hudson, and in full view from that city. A turnpike-road which crosses this range of mountains near those summits, winds up till it reaches the astonishing altitude of 2274 feet. Upon this spot the view is inexpressibly grand. The general altitude of the Catskill mountains may be estimated at about 2000 to 3000 feet across Greene county. From Greene they

pass into Schoharie county with ridges less rugged; and towards the southern part, their continuity is less distinctly defined. Until after forming the falls of the Mohawk, this range traverses Herkimer county, forming a rugged tract, and diminishing in altitude till they cross the St. Lawrence into Canada, at the Thousand Islands. These mountains have obtained from the early Dutch inhabitants the name of Helderberg, or clear mountain, presenting, instead of lofty summits of granitic and schist mountains, an elevated plain of considerable and very uniform altitudes. Around lake George, and to the W. of lake Champlain, we find the Peruvian mountains, which furnish the northern sources of the Hudson, and form the height of land that separates the waters of the Hudson and St. Lawrence. The highest of these is probably that called White-face, which commands a view of Montreal, at the distance of near 80 miles. The altitude of this summit is little short of 3000 feet from the level of lake Champlain. These mountains obtained the name of Peru from the French inhabitants, in allusion to their supposed mineral treasures. With some few exceptions, the whole country S. of the Highlands is underlain by rocks of granite, with superstrata of other rocks, which appear in the elevated tracts. There are some tracts of lime-stone and some of sand-stone, but these are so inconsiderable in extent as to furnish no objection against denominating this the granitic region. Some ranges of hills on the W. of the Hudson, composed of sand-stone, are underlain by granite; and the Catskill mountains are a mass of sand-stone, similar to the Alleghany mountains in Pennsylvania, intermixed with lime; the Helderberg, with some particles of sand-stone, occasionally interperfed. N. and E. of the Highlands the rocks are chiefly schist that form the substratum, while calcareous ridges of great extent occupy the surface. The hills on the eastern border of Columbia and Rensselaer counties are formed chiefly of fragile schist, intermixed with quartz, and occasional superstrata of lime-stone. On the eastern declivities of these hills lime-stone predominates, forming the marble quarries of Stockbridge, Lanesborough, &c. in Massachusetts. The north-western continuation of the Catberg or Catskill presents a kind of calcareous granite, in which the absence of the felspar is supplied by primitive lime-stone. The Peruvian mountains are principally granitic, though ridges of lime-stone, slate, flint, and sand-stone, appear in conglomerate masses, and these are most abundant in mineral treasures. The whole level county of the small western lakes is calcareous. The Taconic hills that border the south-eastern part of Columbia county are granitic.

The rivers of this state are numerous and extensive; and so are its lakes and creeks. The Hudson and the Mohawk are the most considerable rivers, to which we may add the Sacandaga, a branch of the Hudson and Scroon rivers, connected with Scroon and Brant lakes. The creeks of the Hudson and Mohawk are numerous. The Susquehanna rises in this state; and its western branch, the Tioga, is a river of some note, and claims distinction from several creeks belonging to the former river. The Delaware, which receives several rivers and creeks, forms a part of the western boundary of New York; and the Alleghany, a principal branch of the Ohio, has its origin in this state, and its creeks, large and small, are too numerous for our recital. The Chatauga lake discharges itself into Connewong creek. The Cataaraugus and Buffalo creeks run into lake Erie; Tonawanda and Ellicott's creeks into Niagara river, forming a part of the western boundary of the state. Lake Ontario, half of which is in this state, receives the Genesee, the Oswego, and Black rivers, which convey into this lake

the

the waters of several other rivers and creeks. The St. Lawrence washes more than 100 miles of the north-western boundary, and it receives a number of rivers and creeks. Half of lake Champlain also belongs to this state, and it is supplied by several streams. East river also belongs to this state.

The *climate* and *seasons* must in such an extent of country be very various, so that it is difficult to accommodate any general observation to the whole state. In the eastern territory, or wholly S. of the Highlands, where the prevailing winds are southerly through the warm seasons, the weather is very variable; and the changes of temperature, governed by the winds, frequent and sudden. In the northern part of the state, the weather is less variable; but the winters are long and severe, with a clear and settled sky. This region, extending from the southern extremity of lake George, and westward to near lake Ontario and the St. Lawrence, may be distinguished as the region of the "northern climate." That of the "western climate" comprises the great western territory of this state, extending from the Catsberg or Catkill mountains to the great lake. Here south-westerly winds prevail in a considerable proportion throughout the year. A gentle current of air, that may be traced from the gulf of Mexico, and reaching to a distance of more than 1000 miles, prevails almost constantly from the S.W.; and northerly and easterly winds are almost wholly unknown. In this district, the average temperatures are about three degrees higher than in similar latitudes in the eastern climate. Such is the general character of the western climate of the United States, and the distinction is said to terminate, or nearly so, with the region about lake Ontario. The western climate of this state is therefore warmer than the eastern by about 3° of Fahrenheit; and this is attributed to the greater prevalence of warmer currents of air from the S.W. In the region about Albany, the rigours of winter commence about the 20th of December, and end with February, or about the 10th of March, when the ice usually breaks up in the Hudson. From the middle of March to the end of April, the weather is very variable; the changes of temperature great and sudden, though it be generally rainy, with long-continued storms of easterly winds. May is also a variable month; June assumes a summer character; in July, southerly winds are diminished, and drought prevails; August is more showery, and more uniformly temperate, than any month of the year, and affording health and plenty. The former part of September resembles August, and terminating with mild and pleasant weather. October is an agreeable month; early frosts occur about the 26th of September, though corn ripens till the middle of October; and from the 15th to the 25th of this month the foliage of the forest-trees is destroyed, and early falls of snow commence about this time. December is usually cold and showery, and storms from the N. and E. are frequent, and of long continuance. It is observed, that a general modification of temperature, favourable to agricultural interests, has occurred within the last 10 or 15 years.

This state affords facilities for *inland navigation* superior to any other, combining both the objects and the means of intercourse. The connections of the rivers Hudson, Mohawk, Otsego, Delaware, Ohio, Susquehanna, Alleghany, Mississippi, and St. Lawrence, by creeks and streams, and canals with the lakes Oneida, Erie, George, Champlain, Ontario, &c. are peculiarly favourable to internal navigation and commerce. The canal at Rome, which connects the waters of the Mohawk and lake Ontario, and which was completed in 1797, deserves particular mention; and it

should be noticed to the honour of this state, that the western inland lock navigation company is formed for the direct purpose of improving the navigation of the western waters; and that the project of a great western canal for connecting lake Erie and the Hudson by a boat navigation is a very important object.

The state of New York has few *bays*, exclusively of those of Long island, which are very numerous. It has many islands, among which Naffau, or Long island, claims the first place, as it affords more than 100 miles of sea-coast, many excellent harbours, and many advantages for commerce. Its bays are both numerous and large, and it has immediately dependent upon it many subordinate islands. The islands in the bay of New York, as well as that upon which New York itself is situated, and Staten island, and those belonging to the Hudson, Mohawk, Niagara, and St. Lawrence rivers, to lake Ontario, Champlain, George, &c. might be enumerated if our limits would allow. In this connection we might also mention a variety of bridges that serve to facilitate communication and intercourse between the various parts of this state.

The *soil* and *agriculture* of New York deserve our particular attention. The soil is of various characters in different parts of the state. In some districts it is deep and warm, and well adapted to grain or grass; in other parts it is of a looser texture, and is found in various proportions by the admixture of vegetable remains; forming a thick vegetable mould, with a small proportion of earth, and called by the farmers in that country "black muck." This is soon exhausted, and as it rests on a substratum, called "hard-pan" by the farmers, that is cold and stony, it is incapable of being restored or reclaimed by any manure or art of husbandry. The west end of Long island is rich, fertile, and highly cultivated; but the eastern part has a large proportion of sandy barren plains. Below the Highlands, the soil is principally dry and warm, having a gravelly or sandy substratum, or granitic rock. North of the Highlands to the Mohawk, the soil is dry and warm, being either a gravelly or sandy loam in general; and both those which we have mentioned are fitted to be a medium soil. But on the eastern border of the state, the rocks are principally schistose, and a schistose gravel forms most of the soil, which is warm and productive, though not deep. The alluvial flats of Columbia and some part of Rensselaer counties are very extensive and rich; and the valleys, presenting a warm gravelly soil, are also extensive, and furnish much good medium soil. West of Albany are extensive sandy plains, interperfed with marshes, and rather cold and wet till we approach the Helderberg hills. This plain is generally underlaid by clay; but the Helderberg hills are calcareous, and present a better soil, though broken and much diversified.

The agricultural products of this division of the whole territory of the state consists of all the various productions of this country. The west part of Long island, and the counties of West Chester and Dutchess, are well cultivated. The latter is one of the best farming counties in the state. The introduction of gypsum as a manure has marked a new era in the agriculture and rural economy of this region. The west side of the Hudson is considerably behind the eastern. The southern part of Washington county has a warm gravelly medium soil, and abundant crops. Saratoga has much good but more waste land. Its general character is more sandy; and, like that of Albany, rests on clay. Around lake Champlain there is a large extent of clayey soil, extending to the hills that skirt the Peru mountains. With the exception of the alluvial flats, which are extensive and rich, the soil of the country of the Mohawk may be generally

generally denominated a stiff loam, till we go west of the Catskill hills to the Little Falls. Here it assumes a new character. The soil of the mountainous tract of the western region is much diversified: the hills are rocky; the valleys deep and narrow, or spacious and rich. This tract furnishes considerable black muck, or deep vegetable mould, in the valleys. A very large proportion of the soil of this country may be denominated a rich mould, variously intermixed with earth of different kinds; and much of the soil is well adapted for grain and grafs. No part of the state is more rapidly advancing in agricultural improvements than this western region. The soil of the level country east of lake Ontario, and along the St. Lawrence, is a warm sandy loam, with a large proportion of the first rate of medium for agriculture.

The rotation of crops lately introduced into this country marks a new era in its agriculture. We shall close this detail with remarking, that the exertions of the agricultural society of this state have been very beneficial, though its publications need more general circulation.

The *botanical productions* of this state are numerous and various. Its forest-trees are luxuriant. The region of the western climate is principally wooded with deciduous trees, and of the softest growth. Those of the eastern or Atlantic climate are generally deciduous, but less lofty. The most common forest-trees are, oak, maple, beech, walnut, butter-nut, chestnut, birch, tilia or bals-wood, poplar, cherry, sycamore or button-wood, ash, elm, salisfras, hornbeam, sumach, elder, pine, spruce, larch, fir, hemlock, cedar, and in some parts, locust laurel, mulberry, black-walnut, cucumber-tree, crab-apple, and common thorn, of many varieties. The state of New York is essentially agricultural. Wheat is the first object of the farmers; and they also cultivate rye, maize, oats, flax, hemp, peas, beans, &c. and most of the domestic grasses are cultivated with success. Fruits are abundant and various; such as apples, affording cyder of the best quality, peaches, pears, plums, cherries, &c. The garden-fruits are as various as those of any state in the Union.

The *domestic zoology* of the state presents the horse, the cow kind, the merino and other kinds of sheep, which furnish good wool, and swine. The wild animals, not to mention the mammoth, the moose, and the bison, now extinct in this state, are, the deer, bear, wolf, and fox; and more rarely, the otter, the wolverene, the wild-cat, racoon, martin, the weasel, hare and rabbit, squirrel and mouse, &c. The lakes and rivers supply abundance of fish, such as the salmon-trout, trout, sturgeon, chad, herring, pike, and many others. The oysters are in high repute. The number of birds stationary and migrating is very great. Serpents are found in small numbers, and the rattle-snake does not frequently occur; other snakes are numerous. It is needless to mention the insects, of which the number and variety are considerable.

The *mineralogy* comprehends iron-ore, salt, gypsum, lime-stone, marble, slate, native brimstone, coal, ores of lead, copper, zinc, tin, asphaltos, mill-stones, marle and peat, clays, alum, swine-stone, &c. Calcareous petrifications are very common in the calcareous regions. Siliceous sand for the manufacture of glass, plumbago, a variety of ochres, mica, singlars, magnesian stones, amianthus, black flints for muskets, molybdena, iron and copper pyrites, emery, magnetic ores of iron, ores of zinc, ores containing silver and antimony, and rock crystals, are severally found in various parts of this state. Its mineral waters are held in high estimation.

The *constitution* of this state was adopted by a convention of delegates April 20, 1777, and revised in 1801; and its

character is republican. The constitution of the United States was acceded to in this state in 1788: The supreme executive power is vested in a governor and lieutenant-governor, elected every three years by free-holders possessing a clear estate of 250 dollars; as are the senators also. The supreme legislative powers are vested in a senate and house of assembly, which meet at least once in each year. The senators are elected for four years; the members, or representatives, as they are called, who compose the house of assembly, are elected annually. The number of senators is limited to thirty-two; that of members is not to exceed 150. For the convenience of electing senators, the state is divided into four great districts: the southern, which elects five senators, and comprehends six counties; the middle, eight; the eastern, nine; and the western, twenty-two. The general election is held annually. A census of the electors is taken every seven years, and the representation apportioned according to the numbers in the respective counties, increasing the number of representatives each year by the addition of two, until they amount to 150. The senators are divided into four classes, elected at different periods, so that some new senators are chosen annually. The governor is commander-in-chief of the militia, and admiral of the navy, of this state: he has power to convene the legislature; to grant pardons and reprieves for crimes, except treason and murder; and can suspend the execution of sentences in those cases till the sitting of the legislature, which alone has a right to pardon. A council of revision consists of the governor, the chancellor, the judges of the supreme court, or any two of them, whose duty it is to revise all bills about to be passed into laws; and if they object in writing to a bill, a re-consideration takes place, and the same must be amended or approved by two-thirds of both houses before it can then become a law: and this is the negative of the executive power. If the council neglect to return a bill, in ten days it becomes a law, unless the legislature has previously adjourned. A council of appointment consists of the governor, and a senator from each of the four great districts, chosen annually by the legislature. In this council, the governor presides, with only a casting vote. The right to nominate is vested concurrently in the governor and the other members of the council. The list of officers annually appointed by this council is enormous, and consists of most of the subordinate officers of the state.

The chancellor holds courts of equity, and appoints the officers of his court. The supreme court is a court of law. It consists of a chief-justice and four associate judges. County courts consist of a first judge and a number of associate justices. Circuit courts are held in the respective counties by a judge or justice of the supreme court, and the judge and justices of the county. Justices of the peace have cognizance of trials for the recovery of debts to the value of twenty-five dollars; and in New York to the value of fifty dollars. The right of habeas corpus is preserved, and the trial by jury.

The great officers of state are, the governor, lieutenant-governor, a secretary of state, comptroller, treasurer, surveyor-general, attorney-general, council of appointment, commissioners of the land-office, the regents of the university, &c. for the department of state.

Judiciary officers of state, a chancellor, five judges of the supreme court, and a judge of probates.

For the general convenience and the better administration of justice, the whole territory of this state is subdivided into counties, and these into towns.

From the report of the comptroller to the legislature of this state in 1811, the productive funds of this state, in-

vested in stock of banks, United States stock, &c. securities on lands, &c. &c. amounted to 4,191,803 dollars 25 cents, producing an annual revenue of 278,489 doll. 96 cents. To this amount of funds should be added the school fund, amounting to 483,326 doll. 29 cents, producing an annual income of 36,427 doll. 64 cents. The state also owns about 1,000,000 acres of land, which, valued at two dollars *per acre*, amount to 6,675,129 doll. 54 cents. The expenses of government for the year 1811 amounted to 268,366 doll. 22 cents. This estimate draws an excess of revenue amounting to 10,123 doll. 74 cents, and including the balance in the treasury, Feb. 16, 1811, of ready funds, to the amount of 34,129 doll. 86 cents.

The militia of this state consists of every able-bodied male inhabitant between eighteen and forty-five years of age; and the laws have made an honourable exception in favour of those whose religious opinions are averse to war. Agreeably to the annual return of the adjutant-general for 1809, the enrolled infantry amounted to 95,324; the artillery, 3102; the cavalry, 3642; giving a total of 102,068.

The constitution provides for the free exercise of religion in this state in the following terms: "And whereas we are required by the benevolent principles of rational liberty not only to expel civil tyranny, but also to guard against that spiritual oppression and intolerance, wherewith the bigotry and ambition of weak and wicked priests and princes have scourged mankind: This convention doth further, in the name and by the authority of the good people of this state, ordain, determine, and declare, that the free exercise and enjoyment of religious profession and worship, without discrimination or preference, shall for ever hereafter be allowed within this state to all mankind. Provided, that the liberty of conscience hereby granted shall not be so construed as to excuse acts of licentiousness, or justify practices inconsistent with the peace or safety of this state. That no minister of the gospel, or priest of any denomination, shall ever hold any civil or military office or place within this state." In April, 1804, a law was passed authorizing all religious denominations to appoint trustees, for the purpose of superintending the temporal concerns of their respective congregations. And these trustees become a body corporate by that general act, capable of all legal transactions in behalf of the congregation.

All denominations, therefore, are left at liberty to support their own ministry, and maintain the order of their worship, in such way as is most agreeable; and every congregation may designate from three to nine of its members as trustees, who are, with little trouble, invested with corporate powers in behalf of the whole, and authorized to hold estates producing an annual revenue of 3000 dollars. This free toleration has not produced more sects in this than in other states less tolerant of religious opinions. There are many sects however; and in the enumeration of those, no regard is paid to comparative numbers. There are English Presbyterians, Dutch Reformed, Congregationalists, Episcopians, Quakers, Baptists, Methodists, German Lutherans, Moravians, Roman Catholics, Shakers, Jews, and a few of the Universal Friends, or the followers of Jemima Wilkinson, Scotch Cameronians, Anabaptists; and Christian charity would include some Indians, beside those who profess Christianity. But it is worthy of remark, that many of the above sectarian distinctions exist merely in name, while their tenets differ less, perhaps, than those of the same religious society, in the individual opinions.

The manners and customs of this state have undergone a considerable variation during the period that has elapsed from its first settlement to the present day. Among those

who planted the colony of New York, and who for many years afterwards settled in it, a large proportion consisted of Dutch families, who migrated hither from the Dutch Netherlands, and transferred to the societies which they established here, the rural economy of the population of the Netherlands, of Holland, and of the banks of the Rhine. Soon after their arrival, various parts of this state presented buildings resembling those of their native country, and habits of neatness, order, industry, and frugality, which they had practised from their youth. After the conquest of the English in 1664, multitudes flocked hither from various nations of Europe, and produced a considerable change in the original and discriminating character and customs of this colony. In 1685 it had a numerous accession of French Protestants. In 1710 it was augmented by about one hundred families of poor Palatines from Germany; sixty or seventy of which settled Germantown on the east bank of the Hudson, and some at Elopus, now Kingston. Other early German emigrants settled on the Mohawk, in Orange county, on Long island, and in many other parts where their descendants are now found. The early English settled principally at New York and in Long island. The French, at New Rochelle, in West Chester county, and on Staten island. The Scotch fixed themselves, during the more early periods, about Albany, and in Washington county. Massachusetts supplied also the east part of Long island with inhabitants, whose posterity form a large share of the present population. But the Dutch were the original proprietors and first colonists, and therefore their possessions were the greatest and the most valuable: nor did they, or the Germans, next to them in number and importance, altogether abandon their discriminating manners and habits. The Revolution, however, produced a material change in this state, and the change, though effected by sanguinary conflicts, was not unfavourable to its general character. The prosperity that succeeded the peace widely diffused a spirit of enterprise and of emigration; and was followed by a surprising increase of population and wealth. Hence arose those various traits of national character, and those diversified habits, manners, and customs, which have distinguished this state. It is observed, that the new character imparted by the influx of emigrants is beneficial to the state; more especially as the New England people have introduced their improved agriculture, their spirit of enterprise, their ingenuity in the arts, and their social habits. In this state, it is said, there are about 100,000 freeholders; and freehold estates are known to produce for their proprietors from 30,000 down to 50 dollars *per annum*; and this fact is alleged as forming a peculiar feature of the civil habits, manners, and customs of the population of this state.

The English language is chiefly prevalent in this state; though the Dutch and German are in use among people of Dutch and German descent: but these and other dialects are declining, in consequence of the intercourse and influence of a large majority of those who speak English. Some few instances, however, occur, in which public worship is performed in the Dutch, German, and Welsh dialects.

The taste for literature and science is gradually increasing, and is promoted by a variety of publications; and by the progressive improvement of school education, for which a liberal fund is provided, which has been already mentioned. We are informed by the writer of communications, of which we avail ourselves in the compilation of this article, that there are about a hundred printing establishments in this state, and sixty-nine gazettes, besides a very considerable number of other public journals, which contribute to diffuse various kinds of knowledge. The advancement of literature is promoted by

an institution established in 1787, intitled "Regents of the University of the State of New York;" being a society of twenty-one gentlemen, possessing adequate powers derived from the legislature for superintending colleges, academies, and schools. The university of New York is acquiring distinction, and the Columbia college claims high reputation. See COLLEGE.

In this state there are fifteen banking companies, with a very considerable sum of capital stock, which is said to have amounted in 1811 to 12,380,000 dollars; and 11 incorporated assurance companies. The manufactures of this state, consisting of woollen, linen, and cotton cloths, leather, paper, hats, iron, &c. are in an improving condition, and are said to have amounted, in 1811, to 30,000,000 dollars, of which 12,000,000 were produced by household industry and enterprise. If we judge of the commerce of this state by the returns of 1810, it must appear to be very considerable. The domestic exports of that year amounted to 10,928,573 dollars, and the foreign to 6,313,757, making a total of 17,242,330 dollars; and it is said that the port of New York yields about one-fourth of the revenue of the United States, arising from commerce. The exports, exclusive of articles from foreign countries, consist principally of beef, tallow, pork, hams, lard, wheat, maize, rye, butter, cheese, pot and pearl ashes, flax-seed, peas, beans, horses, cattle, lumber, flour and meal, bread and biscuit. The foreign exports are composed of important articles. Wheat, which is the national staple, is exported annually to a very great amount; and about 6,000,000 of bushels on an average, after deducting the supplies for the country, are sent to market from the surplus product of this state. The average annual payments into the treasury of the United States, for duties on imports, tonnage, &c. exceed 4,000,000 of dollars from the district of New York.

The Societies for promoting Agriculture and the Arts in this state are numerous. It has also several Medical Societies; an Historical Society; and also an Academy of Arts lately established at New York. Bible and Missionary Societies are instituted in New York, Albany, and some other counties; and the Charitable and Humane Societies abound. In the city of New York alone there are about forty benevolent institutions; and there are societies of the same kind, as well as those of a literary nature, in Albany, Hudson, Schenectady, Troy, Poughkeepsie, Kingston, Newburgh, Utica, and most of the large towns.

The State-Prison, or Penitentiary, is about two miles from the city-hall, in the city of New York, on the E. bank of the Hudson: it was built in 1796-7, and together with its buildings and courts comprises four acres of ground. The immediate government of the prison is committed to seven inspectors. The convicts are all dressed in uniform, the sexes kept separate, and all are comfortably clothed and fed. Great care is taken of their morals, in the benevolent hope of a reformation.

The Natural Curiosities of this state comprehend the cataracts or falls of Niagara, of the Mohawk, of the Hudson, of West Canada creek, of Black river, Seneca river, Genesee river, and some others of less note. It is probable, that the southern and western parts of this state were occupied by a considerable proportion of Indians at a remote period. So long ago as the year 1535, the country about the lake Onondaga was considered as a favourite situation by the wandering tribes: but their condition was not much known till about the year 1635. At that time, the Iroquoise, or Five Nations, occupied the countries from lake Erie to Ontario, the St. Lawrence, around lake Champlain, and the whole of that watered by the Hudson down to the Highlands, were

very numerous and warlike. Such was their ascendancy, that the Indians of the lower country of the Hudson, on the Connecticut, the Delaware, and Susquehanna rivers, were in a kind of subjection to them. Onondaga was the principal settlement, and the seat of Indian power. Their combination consisted of Onondagas, Oneidas, Mohawks, Cayugas, and Senecas; and it was then so powerful as to be able to send several thousand warriors on distant expeditions. The first Christian colonists, availing themselves of Indian wars, which they promoted, taught the Indians to despise and abhor those for their hypocrisy and perfidy whom they had first considered as beings of a superior order; and thus originated the implacable enmities which not only continued but increased when the French and British became rival nations. About the year 1690, the English erected a strong fort at Onondaga; and in 1696, the French sent a considerable force against the Indian settlement, and succeeded in destroying it. From this time, colonies of each of these nations were planted there at different periods. But we forbear, to pursue their history, and to trace the sanguinary conflicts that served mutually to irritate and incense Indians and professed Christians. At this time, the principal settlements of the Indians are at Oneida and Onondaga, on the Genesee and Alleghany rivers, Buffalo creek, and Tufcarora, besides other places which we have not room to enumerate in detail. But we must hasten to finish this sketch of the New York state by a brief abstract of its history.

Soon after the discovery of America, towards the commencement of the 16th century, the present state of New York was possessed by the Iroquoise, and Canada by the Algonquins, two rival nations of Indians. About the year 1608, the French planted colonies in Canada, which they had laid claim to from having first failed up the St. Lawrence as far as the present Montreal. In 1609 Champlain, the founder, discovered lakes Champlain and Geneva, when he defeated a small party of the Iroquoise. In 1608 Hudson, an Englishman, discovered the East and North rivers, ascending up the latter as far as the present Albany; and soon after he held his right to the Dutch. In 1614 the States General of Holland erected a fort at Albany, and granted an exclusive trade on Hudson river to the Dutch West India company; and in 1629, Wouter van Twiller, the first governor, arrived, and took the command of New Netherland, as it was then called. The English, who still laid claim to this country, objected to the sale of Hudson; and in 1663-4, the English king granted the whole to his brother James, duke of York and Albany, afterwards James II. A small armament subdued the colony for England, which then took the name of New York, as did the city also. In 1673 New York was conquered by the Dutch, but restored in 1673-4. The duke's grant was confirmed, and the colony assigned to the English by treaty; and this right they held till the Revolution. From the surrender of the province in 1664 to 1683, the duke of York possessed full sovereignty. He appointed the governor and the council, who made rules and orders that were acknowledged as laws. These were called the duke's laws; they were collected and arranged about 1674, and a copy of them is deposited among the records of the state. Those, it is said, which were made in 1683, and after the duke's accession to the throne of England, when the people were admitted to a participation of the legislative power, are defaced or lost. No regard is now paid to any laws made here antecedently to 1691, when the first legislative assembly was organized. New York was then divided into nine counties, and the house consisted of seventeen delegates. The second legislative assembly was convened in 1708. We shall not minutely

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trace the series of events that occurred in this state before the year 1776, when, on July 4, the thirteen united colonies were declared independent. This was followed in 1777 by the formation and adoption of the state constitution, by a convention of delegates, which was revised in 1801. In 1783, New York was evacuated by the British, and general Washington made his public entry Nov. 25. In 1787 the present constitution of the United States was proposed by the convention, and acceded to by this state in 1788, by a majority of 30 to 25 votes. General Washington was elected president of the United States, and Congress met at New York for the first time under the new federal constitution, March 4, 1789. In 1797 Albany was made the capital of the state. In 1801 the legislature divided the state into thirty counties, and these into towns. An academy of the fine arts was founded in New York. In 1807 a steam-boat was established on the Hudson for passengers, between New York and Albany; and in 1811 their number was 5. In 1809-10, the capitol was built at Albany, at an expence of 115,000 dollars, and was first used by the legislature in the session of 1809-10.

YORK, New, a county in the American state of the same name, comprises the island of Manhattan, or York island, on the E. side, and near the mouth of Hudson river. It is about $14\frac{1}{2}$ miles long from N. to S., and in breadth varying from half a mile to two miles; its area is about $21\frac{3}{4}$ square miles, or 13,920 acres. It is situated between $40^{\circ} 42'$, and $40^{\circ} 52'$ N. lat., and $0'$ and $8'$ E. long. from the city of New York. It is bounded on the N. and E. by Haarlem and East rivers, S. and W. by the Hudson, or by York bay, and the state of New Jersey. The limits of the county, town, and city of New York are the same; and the only legal subdivisions are the wards, ten in number. The jurisdiction of the city and county of New York extends to low-water mark on the opposite shores of the waters that surround this county. The agriculture of New York county is highly respectable, and its horticulture is in the first style of the country. The whole population of the county probably exceeds 100,000; by the census of 1810, it amounted to 96,373. This county sends 11 members to the house of assembly.

YORK, New, a city of America, the capital of a county of the same name, is situated on the E. bank, at the confluence of Hudson and East rivers, at the fourth end of New York island. N. lat. $40^{\circ} 42'$ $40''$. W. long. from Greenwich $74^{\circ} 0'$ $45''$. The compact part of this city extends along the Hudson about two miles, and along East river, from the S.W. angle of the battery, near four miles: its circuit is about $7\frac{1}{2}$ miles. The streets of the ancient part are irregular; but the northern part has been recently laid out to greater advantage. Many of the streets are spacious, running in right lines, and intersected by others at right angles. The surface has at present a gentle ascent from the Hudson and East rivers, and commands a fine view on the right and left of the town, the above-named rivers, and their crowds of shipping. The principal streets are, Broadway, opening to the N.E., and extending through the whole length of the city, Greenwich-street, Pearl-street, &c. &c. The usual tides at New York are about six feet, and the depth of water is sufficient for the largest ships; and the harbour, which is safe and good, is capacious enough for the largest fleets, and very rarely obstructed by ice. The houses of this city are well built of brick, and its public buildings are numerous and elegant. The first of these that deserves mention is the city-hall, in which are held the courts for the city and county of New York. This building stands on elevated ground, and its structure is ornamental to the city.

The whole number of the churches, or houses for Christian worship, is 37, besides a Jewish synagogue. Of these, eight are Presbyterian, eight Episcopal, four Dutch Reformed, three Scots Presbyterian, three Methodist, two for Friends or Quakers, two Baptist, two German Lutheran, one French Protestant, one Moravian, one Roman Catholic, two African. The New York hospital is an extensive establishment; the custom-house adjoins the battery at the S.W. angle of the city; the gaol and bridewell are opposite to the Park, and the alms-house is on the same square with the gaol, bridewell, and city-hall. The college is about midway between the Park and the river Hudson; and St. John's church, reckoned the most elegant in the city, is in Hudson-square, farther north. The state-prison is two miles N. of the battery, on the bank of the Hudson. Here are also a library and theatre, six market-houses, and many other buildings that might, if space were allowable, be enumerated. There are eight banking-companies in this city; and their houses and offices, together with those of the insurance, manufacturing, and other companies, and those of various societies, add to the number of edifices that adorn the metropolis. The population, which by the census of 1810 was estimated at 96,373, is supposed to amount to more than 100,000. The city and harbour of New York have been lately fortified against naval assaults at a very great expence: but we should be tedious in minutely describing the works which have been constructed for this purpose. The number of charitable establishments, and of schools for education in this city, is very great, and does honour to the disposition and liberality of its inhabitants. The markets, which are kept every day, are well supplied with the productions both of land and water. The public walks and amusements in the vicinity of this city afford attraction to its stated inhabitants, and to those who occasionally resort hither. The theatre, reading-rooms, public-gardens, park, and walks on the battery, afford amusement, and contribute to activity and health.

The city of New York is governed by a mayor, recorder, aldermen, and assistants, who constitute the common council. Each ward chooses an alderman and assistant. The mayor, deputy-mayor, recorder, and aldermen are ex-officio justices of the peace, and justices of oyer and terminer; and the mayor, aldermen, and commonalty, are authorized to hold a court of record or of common pleas; and this is called the mayor's court, and deemed of great importance. For the manufactures, commerce, literary institutions, &c. &c. of the city of New York, we refer to the account already given of the state of *NEW YORK*. Melish. Morfe. Spafford's Gazetteer of New York, 1813.

YORK, New, a post-town of Virginia; 167 miles S.W. of Washington.

YORK TOWN, or **YORK**, a township of West Chester county, in the state of New York, 45 miles N. of New York, bounded N. by Dutchess county, E. by Somers and Newcastle, S. by Newcastle, W. by Cortlandt; in length N. and S. 10 miles, and nearly 4 miles wide. The general surface is hilly, but productive, and well distributed into arable, pasture, and meadow lands. In 1810, here were 269 taxable inhabitants, 142 electors, and in all 1924 inhabitants.

YORK TOWN, a town of the state of Virginia, capital of the county of York, on the right bank of York river, about 10 miles from its mouth, containing about 800 inhabitants. In the year 1781, the British army under Lord Cornwallis surrendered themselves prisoners of war to the united forces of America and France near this town, and was the occasion of a peace which followed soon after. A marble

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column, with a suitable inscription and trophies, was ordered by Congress to be erected on the spot in commemoration of the event; 8 miles E. of Williamburgh.

YORKSHIRE, a county in the northern part of England, which, for extent, for its number of inhabitants, and for its natural and artificial productions, is by far the most considerable in the kingdom. In its general form the county is an irregular quadrangle; the longest diagonal extends from N.W. to S.E. about 130 miles, and the shortest from S.W. to N.E. about 90 miles. The area of the county comprehends about 5,960 square miles, or above 3,814,000 statute acres. Yorkshire, taken at its extreme points, is situated between the parallels of $53^{\circ} 18'$, and $54^{\circ} 40'$ N. latitude, and between $2^{\circ} 40'$ of W. and $0^{\circ} 10'$ of E. longitude from Greenwich. On the N., the E., and part of the S. sides, it is distinctly defined by rivers and by the sea. On the N. it is separated in its whole extent, from the county of Durham, by the river Tees. From the mouth of this river to the entrance of the Humber, the whole E. side is washed by the German ocean. By the estuary of the Humber and the river Trent, it is divided from Lincolnshire on the S. The limits between Yorkshire, and the counties of Nottingham, Derby, and Chester on the S., and those separating it from Lancashire and Westmoreland on the W., are merely conventional, being indicated by no natural feature of the country; the latter, however, in general, coincide with the mountainous range which distinguishes the northern from the southern provinces of England. At a very early period of the Saxon dominion, the great county of York was subdivided into three districts, still recognized, and still under the corrupted name of ridings. These are termed north, east, and west, in reference to their relative positions with respect to each other, and to the capital city of the county. The North Riding is subdivided into 12 wapentakes, the East into 7, and the West into 11 wapentakes; the whole county thus containing 30 wapentakes and 563 parishes. The wapentake, a division adopted in certain northern counties of England, corresponds generally to the cantred or hundred of the southern provinces. The whole county comprehends one archiepiscopal city, York, and 59 market-towns, of which 13 are parliamentary boroughs. Of those left in the North Riding are 5, *viz.* Malton, Northallerton, Richmond, Scarborough, and Thirsk; the East Riding contains three boroughs, Beverley, Heydon, and Hull; in the West Riding the five boroughs are, Aldborough, Boroughbridge, Knaresborough, Pontefract, and Ripon. Yorkshire sends thirty members to parliament; *viz.* two for the county, two for the city, and two for each of the boroughs just named. According to the official reports made in 1811, the number of houses and inhabitants in the county was the following:—In the North Riding, 33,567 houses, and 152,445 inhabitants; in the East Riding (York city included), 31,420 houses, and 167,353 inhabitants; and in the West Riding, 129,575 houses, and 653,315 inhabitants. From this statement, Yorkshire, at that period, contained altogether 194,562 houses, and 973,113 inhabitants, or on an average 163 persons for each square statute mile.

General Appearance, Soil, and Climate.—Yorkshire is an extensive and interesting county: in its geographical features, and geological characteristics, it presents important themes for inquiry and disquisition. Its ancient history, and the numerous antiquities with which it abounds, afford other and not less interesting topics for investigation and comment. The manufactures, commerce, and trade of the county; its mineral productions, and agricultural practices, are also entitled to the most careful and critical develop-

ment of the topographer. It is, however, to be regretted, that neither of these subjects has hitherto been satisfactorily elucidated by a local historian; whence we shall be necessitated to refer to and cautiously analyse several detached and imperfect works, to render a short topographical account of this widely-extended county in any degree useful to the general reader. In the sequel these works will be referred to.

Yorkshire presents a great variety of surface: mountains, hills, vales, moors, fens, rocks, coast, and rivers, are its component parts; but these are greatly diversified. The North Riding consists principally of two hilly regions, separated by a comparatively low tract, which opens on the S. into the spacious plain or vale of York. The hilly parts are commonly termed, from their position and their nature, the E. and the W. moorlands. Those on the E. bounded by the valley of the river Tees on the N., and by the sea on the N.E., occupy a space of 30 miles from W. to E. by about half as much from N. to S. They consist in general of bleak heath, interperfed with loose blocks of stone, or with peat-mofs and bog. The whole is destitute of wood, excepting in a few intersecting dales or valleys, where cultivation is practicable. Of these dales a few are of moderate extent, particularly Elsdale and Bildale, in the eastern parts toward the sea. The western extremity of these moorlands, in the district of Hamilton, produces heath intermingled with large quantities of coarse grass. Between the N. edge of the moorlands and the river Tees is the fertile district of Cleveland. Several productive valleys intersect the W. moorlands, of which Wenleydale is the most considerable. Watered by the river Ure, the bottom of the valley furnishes rich grazing grounds, bordered on each side by sloping inclosed fields, which reach up the hills for more than a mile from the river. In the East Riding the face of the country, although varied, is less boldly characterized than that in the N. It is divided in the middle into two extensive plains, by the Wolds, a range of hills stretching N. and S. Towards the sea the coast of this Riding is in general low when compared with that of the North Riding; but in several places it rises to cliffs of considerable height, as at and in the vicinity of Flamborough-head. The S.E. part of this Riding consists chiefly of a tract of fen and marsh, about 20 miles in length, and four in breadth, which spreads from the sea to the Humber. This part of the Riding, forming the wapentake of Holderness, runs out to the S.E. and S., and terminates its course at the Spurn, a well-known point on the N. shore of the Humber. A succession of easy risings forms the eastern ascent of the range of the Wolds; but on other sides they are steep; and the whole have an agreeable and peculiar appearance. Considered with respect to extent and population, to manufactures and trade, the West Riding is by far the most important division of Yorkshire. Its surface is very irregular, varying from the low marshy tracts in the E. to the rocky mountainous country in the W. The level marshes are the continuation of those already mentioned in the East Riding, and extend westward nearly to the great N. road through Doncaster. Still farther westward lies the middle division of the West Riding, gradually and beautifully swelling into hills, and extending to Sheffield, Bradford, and Otley. Beyond these towns, the country becomes rugged and mountainous, and is composed chiefly of black moors, which terminate in the lofty range of hills bordering on Lancashire. These hilly and mountainous tracts are not, however, without many beautiful and romantic valleys, among which are those watered by the rivers Aire, Nid, and Wharfe. Several of the smaller dales are well-

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well-wooded and inclosed, and have numerous villages interperfed.

The foil of Yorkshire is not lefs variegated than the furface. In the E. moorlands of the North Riding, wherever the ground is covered with ling or heath, the upper foil is invariably black moor peat : but the fubfoil is various, and confifts of clay, free-ftone, and hardened fand. In that part of the moors called Hamilton, the foil confifts generally of fine loam on lime-ftone rock. In the interfecting dales, black moory earth, fand, and grit-rock, more or lefs, prevail ; but the vale of Cleveland, along the river Tees, is compofed chiefly of ftrong tenacious clay. Lime-ftone, or a calcareous rock, is the general bafis of the W. moorlands ; and the beneficial effects of this fubfoil are evident in the grafs and other ufeful productions with which the furface is generally covered. In the extenfive tract of plain ftyled the Vale of York, which occupies the interior parts of the county, and comprehends portions of all the three Ridings, confiderable changes of foil are found. In the N. part towards the river Tees, a rich gravelly loam prevails. The flopes of the high grounds on the E. and W. are in fome places cold, and abound in fprings ; but in the greateft part the foil is ftrong and fertile. Of the Eaft Riding, the moft ftriking feature is the range of hills called the Wolds, compofed of chalk ; but the furface is in general a light free loam, interperfed with chalky gravel, often very fhallow. The great plain between the Wolds, the fea, and the lower part of the Humber, contains many extenfive tracts of fertile cultivable land, efpecially in the N. and E. quarters ; but the fouthern diftricts, towards the river, are covered with marfhes and fens, fufceptible, where draining can be praftifed, of material improvement. In the continuation of thofe fens, fituated on the W. of the Wolds, called the Levels, the foil is either clay or fand, with moorifh tracts interperfed ; but on the banks of the Darwent and the Oufe ftrong clay and loam prevail. In the extenfive Weft Riding foils of every kind are to be found, from deep ftrong clay and rich loam to the pooreft peat-earth. Clay and loam, but mingled with fome fand and moor, prevail in the E. diftrict of this Riding, while the middle divifion confifts chiefly of loam on a lime-ftone bafis. Similar foils extend through the W. parts, but are frequently interrupted by tracts of moor of different kinds.

In a country of fuch extent, and of fuch variety of foil, elevation, and exposure, as Yorkshire, an accordant variety of climate, with regard to temperature, humidity, and falubrity, muft naturally be experienced. The E. moorlands, advancing high and bold into the German ocean, are neceffarily expofed to the cold, moift, and impetuous winds from the N. and E. The climate there, however, is rather difagreeable than unhealthy ; for the high grounds are frequently involved in fogs and vapours from the fea. Among the W. moorlands the climate is ftill more fevere ; but its effects on the productions of the furface are powerfully counteracted by the calcareous rock of which thofe mountainous tracts confift. By their diftance from the fea, combined with their much greater elevation, the fnow remains on them confiderably longer than on the E. moorlands. But the greateft obftacle to agricultural labours in the W. parts of the county is the almoft inceffant rain which falls among the mountains. On them are accumulated and condensed the vapours collected by the oppofite winds, which prevail on the contrary fides of the ifland. By the humidity thus produced, no attempt to raife corn-crops among thofe high lands can fucceed. In the intermediate plains and gently-fwelling tracts of the centre of the county, the

climate is, on the contrary, in general mild and temperate, in proportion to the remotenefs from the mountainous quarters. The low grounds on the banks of the Darwent, are, however, fo moift, although warm, as to be much better adapted to paturage than to corn-land. What is faid of the climate of the W. parts of the North Riding is equally applicable to the correfponding portion of the W. ; for there the climate is alfo rainy, cold, and ftormy. At Sheffield, although on the S. border of the county, the quantity of rain which falls in a year is about 33 inches. It is, indeed, found by experience, that the lofty tracts which feperate Yorkshire from Lancashire and Cheshire are fully as fubject to fog, rain, and ftorms, as any other portion of England. But notwithstanding thefe circumftances, the air is pure and healthy. The middle and lefs-elevated tracts of the Weft Riding are equally healthy, milder, and lefs humid ; holding a defirable medium between the tempeftuous blaits of the mountains in the W., and the dull fogs and damps which ufually befet the low marfhy country in the E. On the oppofite fides of the Wolds, in the Eaft Riding, a different temperature is experienced ; for by thofe hills the W. divifion is in general fheltered from the cold damp winds from the fea and the entrance of the Humber, which prevail over the E. divifion. On the Wolds themfelves the air is fharp, and the fnow remains for a confiderable time on the ground. But the mildnefs of the climate in the W. Levels is abundantly compensated, in regard to falubrity, by the vapours of the marfhes.

Mountains.—The E. moorlands of the North Riding form a peculiar feature in the county ; for they are wholly detached by their pofition, and by their fubftance, from the mountains in the W. Some points of the E. moorlands rife nearly 900 feet above the level of the fea ; but the moft remarkable fummit of the whole is Rofebury Topping. This fingular hill, fituated midway between Stokesley and Guifborough, towards the N.W. edge of the moors, fhoots up in a conical form, to the height of 1488 feet above the fea. By its detached pofition and fuperior elevation, it commands, in all directions, a profpect at once extenfive and interefting. The hill feems to reit on a bafis of alum-rock, interperfed with iron-ftone ; and its pinnaced fummit indicates to the furrounding country the approaching changes in the weather ; for when the fummit is involved in clouds, rains feldom fail to defend on the neighbouring low grounds. It is, however, on the W. borders of the county, that the moft elevated mountains are found. Thefe are a portion of the chain, which, commencing in the S. in Staffordshire, extend northward, with increasing elevation, through Derbyshire, Lancashire, Weftmoreland, Cumberland, and Northumberland, into Scotland. In that portion of this range which belongs to Yorkshire are feveral fummits of very confiderable elevation above the fea. Of thefe, the moft remarkable are, Penninant, which rifes, according to barometrical meafurement, to the height of 3930 feet ; Ingleborough, 3987 feet ; and Whernfide, 4052 feet. The laft mountain is the higheft in England ; for Croftfell on the borders of Cumberland is in height only 3839 feet ; Skiddaw, 3530 ; and Snowden, the higheft in Wales, 3568. Bennevis, a detached mountain in the N. of Scotland, and the moft elevated in Britain, rifes to the height of 4387 feet. Penninant, fituated about 7 miles N. from Settle, is fteep and towering. Ingleborough confifts of a bafis of lime-ftone, but towards the fummit the grit-rock appears. The E. and S. fides of this mountain are very fteep, and of difficult accefs, on account of a deep morafs at the bottom ; but the W. and N. fides, particularly the former, may be afcended

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ascended with ease. Continually receiving vapours from the Irish sea on the W., Ingleborough is seldom free from clouds, and the whole mountain abounds with springs: whence it is covered with verdure, and sheep graze on the most elevated parts. In the vicinity appear Pennigant, distant 6 miles to the E., and Whernside 5 miles to the N. On the N.W. are the mountains of Westmoreland, and on the W. spreads out the low land of Lancashire, bounded at the distance of 24 miles by the Irish sea, of which a great portion may, in clear weather, be descried. In the midst of a circle of hills rises Whernside, on which account, although more elevated, the views from it are not equally interesting with those from Ingleborough. Near the summit are several small lakes or pools, there called tarns, one of which is about 180 yards in length by nearly an equal breadth. In the East Riding, the only hills of note are the Wolds, which exhibit themselves to advantage, in rising out of the low country around them; but at no point are they supposed to exceed 600 feet in height.

Rivers.—Along the whole length of the North Riding, from W. to E., the county is bounded by the river Tees. Rising in the mountains of Westmoreland and Cumberland, it pursues a very indirect course into the German ocean below Stockton, where it spreads out into an estuary three miles in breadth. The river Tees is navigable for ships of considerable burthen up to Stockton; but the channel is serpentine and intricate, and the current is rapid. Commodious anchorage is, however, found at the entrance, in winds from the W. and S. A few inconsiderable streams from the W. moorlands fall into the river Tees; but the great body of the waters of Yorkshire take their course in the opposite direction, and unite with the Humber. Of these rivers, the most northern is the Swale, which, rising in the W. moorlands, enlivens the romantic Swale dale, and, after visiting Richmond, bends S.E. until it reaches Boroughbridge, where it unites with the Ure. The latter river, proceeding from the same moors, passes near to Ripon, and in some part of its course separates the North and West Ridings. Having received the Swale, about six miles below Boroughbridge, the Ure takes the name of Ouse, from an insignificant rivulet which joins it on the W. side. Under this last appellation the combined stream, still farther augmented by the waters of the Nid, traverses the city of York, where it becomes the limit between the West and the East Ridings; and being navigable for large barges up to that city, it receives on its W. side the rivers Wharfe and Aire: at last, after a very wandering course to the southward, in conjunction with the Trent, it disappears in the estuary of the Humber. The Aire, already mentioned, a very considerable stream, issuing from the mountains of Craven, facilitates by its waters the important manufacturing commerce of Leeds. Receiving on the W. side the current of the Calder, which performs the same service to Wakefield, the joint stream conveys an important accession to the Ouse. Still farther to the S. the Don pursues its course from the W. mountains to Sheffield, where it bends to the N.E. by Rotherham and Doncaster, to its influx into the Aire. Before it be lost in the Humber, the Ouse receives on the E. the Darwent, which, having its sources in the E. moorlands, flows in general S.W. by Malton, across the western parts of the E. district. Two small streams still deserve notice in Yorkshire, not so much for their length of course, or volume of water, as for their great utility in forming the principal ports of the county. In the E. moorlands of the North Riding rises the Effe, which after watering Elkdale opens into the German ocean through the

harbour of Whitby. The river Hull traverses the East Riding from N. to S. passing near to Beverley, and, at its influx into the Humber, forms the secure though not capacious harbour of Kinglton, which, from the river, is generally also called Hull.

Canals of Yorkshire.—See CANAL.

Coasts and Harbours.—The sea-coast of Yorkshire, though very extensive, affords but very few harbours of any importance. The mouth of the river Tees, as already stated, is frequented as a place of anchorage in winds from the south and the west. Vessels also often resort to other spots on the coast when the wind blows off the land, such as to Robinhood's bay to the southward of Whitby, to Filey bay on the north-west, and Bridlington bay on the south-west of Flamborough-head.

The principal harbour on this coast is that of Whitby. (See WHITBY.) Scarborough bay is serviceable in westerly winds; and the pier, a noble stone structure, furnishes easy access and safe protection for ships of considerable burthen; for at spring-tides, the depth of water at the entrance is from twenty to twenty-four feet: for want of a back-stream, however, the harbour is in danger of being filled with sand. The entrance of the Humber affords to shipping less protection than from its locality might be expected; for the shores on both sides of Yorkshire on the N.E. and of Lincolnshire on the S.W. are low, and the channel is much incumbered with sand-banks and shallows. Notwithstanding these disadvantages on its north bank, just at the point where the estuary turns its direction from E. to S.E., is situated the much-frequented and important harbour of Kinglton-upon-Hull. The natural accommodation of the river has proved very insufficient for the increased shipping belonging and trading to the port, which ranks as the fifth in the kingdom. Docks of great capacity have therefore been excavated, in which vessels lie afloat or dry, as may be required. From this port, the produce of the great manufacturing districts in the interior of the country are exported to foreign parts; and there foreign commodities are transferred to smaller vessels, to be in their turn distributed over the interior of the kingdom. The most remarkable projection of the coast of Yorkshire is the bold and lofty promontory, called Flamborough-head. The cliffs rise perpendicularly over the sea to the height of 100 and 150 yards. They are composed of a mouldering lime-stone rock, of uncommon whiteness; and at the bottom are pierced by a number of caverns, some of them entering a great way into the rock. A new light-house is placed about 400 yards west from the extremity of the promontory. About four by east eleven leagues from Flamborough-head is another point of great consequence to mariners. This is the Spurn-point, which, running out southwards, low and narrow, forms the north limit of the mouth of the Humber. The light-house is situated in N. lat. 53° 41', and E. long. 0° 17'.

Agriculture.—From what has been already noticed respecting the mountainous and the marshy tracts comprehended within the capacious limits of Yorkshire, agricultural improvements in them must be comparatively very limited. In other districts, however, particularly in the spacious plains forming the central parts of the county, every species of amelioration of the soil which the industry of the inhabitants, availing themselves of the natural means within their command, could apply, has been generally brought into action. The farms are of very unequal extent and rental, conformably to the nature of the soil and to the situation of the farmer with respect to a market. It is remarkable, that in the North Riding leases are unusual; but although the husbandman labours on so precarious

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rious a possession, changes of occupants of farms are by no means common. In the vale of York one-third of the land is computed to be in tillage, and two-thirds in grass; but in Cleveland, along the fourth bank of the river Tees, the country is equally divided between corn and pasture. In the environs of Thirsk, where the dairy is the chief object of pursuit, fully three-quarters of the land are devoted to it. In the valleys or dales which intersect the east moorlands, about one-fifth of the surface is in tillage; but in those of the west, a much smaller quantity is usually ploughed: those parts although inclosed are therefore generally in pasture. In few districts of England have improvements in agriculture been more generally or skilfully introduced than of late years in the East Riding. The farms are commonly large, and vary in annual rent from two or three hundred pounds to a thousand; but in the marshy tracts, called the levels, they are mostly small. By drainage there, and in the flat country, in the vicinity of Hull, large tracts, formerly flooded, now produce plentiful crops of corn; the value of the land being thus increased to ten times its former worth. In the hilly range of the Wolds, barley and oats have in many places been superseded by wheat. In the West Riding the farms are generally small, but in the environs of the manufacturing towns a great portion of the ground is occupied by the inhabitants for the use of their families. To the eastward of Leeds, Wakefield, and Rotherham, the greatest part of the Riding is corn-land; but this tract contains no small proportion of common fields. The soil, however, is good, and improvement may be easily introduced. In addition to grain of all sorts, flax is cultivated in the marshlands to considerable extent; and in the environs of York mustard is now a valuable article of cultivation; though it is still considered as the produce of Durham. The horses of Yorkshire, and in particular those of the North Riding, have long and universally been famed. Cleveland furnishes an excellent breed for the coach and the plough; the northern parts of the vale of York others for the coach and saddle; and many of both kinds are bred in the southern parts and the marshes. The East Riding also rears horses of peculiar value. A smaller but hardy and useful kind is bred in the dales of the east moorlands: many of an equally servicable description are also produced in the moorlands on the west. The horned cattle of Yorkshire are of various kinds, adapted to the nature of their pastures, and to the uses for which they are employed. The north parts of the vale of York and the district of Cleveland produce the Tees-water breed, which is ranked among the largest in the kingdom. In the plains where cattle are chiefly kept for the purposes of the dairy, the milk, and not the form or strength of the race, is the main object of attention with the farmer. The sheep in the various parts of the county are also extremely different in their nature and properties. In the North Riding, the flock has of late years been considerably improved by the intermixture of the Northumberland and other breeds. The sheep of the west moorlands are small; but the wool is tolerably fine: those of the east moorlands are still smaller, but with a very coarse wool. Many of the old sheep-walks on the Wolds, in the East Riding, are now broken up, and converted into corn-land. In the West Riding, by the introduction of the Leicestershire breed, the sheep have in many places been highly improved. Those bred on the west moors and hills of this Riding, when brought down early to pasture in the low grounds, become very valuable for food.

In many parts of Yorkshire, great amelioration of the soil has been produced by hollow-draining; irrigation,

and burning the surface, have also been advantageously adopted. In certain tracts, bones bruised in a mill are usefully employed in composts for manure. Considering its great extent, the North Riding of Yorkshire contains but a small proportion of woodlands; the whole having been estimated at about 25,000 acres, of which the vale of York, with its boundary hills to the north, contains about 11,000. Large full-grown timber is accordingly very scarce, excepting on the estates of the earl of Carlisle, C. S. Duncombe, esq. and some other land proprietors. But the oak-timber of this Riding, produced on hard rocky ground, if not of great size, is solid and durable; and hence the valuable qualities of the shipping built at Whitby and Scarborough. The planting of the Wolds in the East Riding has been successfully begun by several proprietors. In the West Riding, the quantity of oak and ash is very considerable; and both are much used for ship-building, and for the various demands of the manufacturers: much is also consumed in the coal and other mines. In the vicinity of Sheffield, the duke of Norfolk possesses above 1500 acres of woodland. According to a calculation made in 1799, the waste lands in this Riding amounted to upwards of 400,000 acres, of which one-third seemed to be proper only for planting. No great progress in that operation has, however, yet been made.

Manufactures.—The manufactured productions of Yorkshire, especially of the West Riding, are of the very first importance to the county and to the kingdom, as well as to the multitudes to whom they furnish employment and wealth. The principal inducement for the establishment of those great works in the interior of the country was the plentiful supply of water and fuel for giving motion to machinery, and for the various other operations of the several branches of industry. Leeds, situated on the north bank of the river Aire, has long been celebrated as the centre of the manufacture of woollen cloth; and it is still the great mart for that staple article of the commerce of Yorkshire. (See LEEDS, and WOOLLEN MANUFACTURE.) The white cloth is chiefly made at and about Dewsbury, among the hills which separate the valleys of the Aire and Calder, and in the vicinity of Wakefield. The mixed cloth is principally made in the villages comprehended in the parish of Leeds to the westward of the town; in the vale of Calder west from Wakefield; and also in the environs of Dewsbury. In the year 1806, the number of yards of broad cloth manufactured in the West Riding of Yorkshire is stated at 10,079,256, and of narrow cloth at 6,193,317. But in 1810 the broad cloth was only 9,826,048 yards, and the narrow cloth had increased to 6,951,762 yards. In 1811, however, the quantity of both sorts of cloth had sensibly diminished; for the yards of broad cloth were only 8,671,042, and those of narrow cloth 6,180,181; one of the many effects produced on the industry, and consequently on the well-being of the county and of the kingdom at large, by the hostilities in which Britain was then deeply involved on both sides of the Atlantic. The cutlery and plated goods of Sheffield are in all their branches carried to a perfection and an extent of which it is not easy to furnish a satisfactory account. The cutlery, consisting of edge-tools of every description, files, anvils, saws, &c. is not confined to that town, but manufactured in all the neighbouring villages. The plated goods, consisting of teapots, coffee-pots, tankards, candle-sticks, and many other articles of household use, are all prepared within the town. In it are also several founderies for iron, brass, and white metal.

Minerals, &c.—Excepting the alum on the borders of the east moorlands, and the lead of the vicinity of Richmond to-
wards

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wards the opposite quarter, the North Riding of Yorkshire furnishes but few mineral substances of peculiar value. Copper of good quality, it is true, was wrought about the middle of the last century near Middleton-Tyas; but the works have for some time been discontinued. Copper was also discovered about twenty years ago at Richmond. In the vale of the river Swale, twelve miles above that town, are several very profitable lead-mines. The iron-stone of the east moorlands has not hitherto been applied to any useful purpose. It appears, however, from ancient records, that as early as the beginning of the thirteenth century, iron was wrought and forged in Kofedale. Aytou, a few miles S.W. from Scarborough, is the only place where forges are now established, and those are but inconsiderable. The great alum works are principally situated on the sea-coast on both sides of Whitby, and in the vicinity of Guisborough. See **WHITBY** and **ALUM**.

Various parts of the North Riding produce coal, particularly in the plain between Easingwold and Thirsk; and in the west moors, the coal hitherto discovered seems adapted only to the burning of lime: the north part of the Riding is consequently furnished with that mineral from the adjoining county of Durham. Good free-stone for building appears in many parts of the Riding: a few miles west from Whitby is a quarry from which have been drawn the blocks employed in constructing the new piers of that town. Limestone, and a species of marble not inferior to the Derbyshire, are found in different places; and loose blocks of red granite are seen on the surface in certain parts of the west moorlands.

In the East Riding, the chalk of the Wolds is the only mineral substance of importance hitherto discovered or brought into use; but the mineral productions of the West Riding are of peculiar value; for it contains lime, coal, iron, and lead, in great abundance. None of them, however, are found in the low level tracts in the east division of the Riding. The lime-stone extends all to the westward of a line running northward from Doncaster to Tadcaster. The tracts situated between the rivers Aire at Leeds and Calder at Wakefield are the principal seats of the coal-mines, which abound likewise in the neighbourhood of Bradford, Barnsley, and Sheffield. Near Bradford also there are very considerable iron-mines. Lead is principally extracted from the mines of Grassington, the property of the duke of Devonshire.

Yorkshire contains several mineral waters of great virtue and celebrity. The chalybeate and sulphureous springs of Harrogate have long been in high repute. See **HARROGATE**.

Scarborough, on the sea-coast of the East Riding, has long been celebrated for its mineral springs, which issue from the foot of a lofty cliff on the shore, a little way to the southward of the town. See **SCARBOROUGH**.

Ancient History, Remains, &c.—The great county of York was but a part of the territory of the British tribe, called in Roman history the Brigantes: they are not however mentioned by Cæsar. It appears that they were first overpowered by Cerealis, in the reign of Vespasian, in the year 71 of the Christian era. In 78, the Roman arms were carried beyond the river Tay in Scotland, where Agricola encountered the Caledonians, under Galgacus: but, contrary to the usual practice of the Romans, after a signal victory over the natives, as it is represented by Tacitus, his son-in-law and professed panegyrist, the Roman commander, retreated into the southern part of the country previously subdued. Having established a chain of posts across the

narrow isthmus, between the firths of Forth and Clyde, Agricola was in the year 85 recalled by Domitian. From that period, until the arrival of the emperor Adrian himself in Britain in 120, little is known of the transactions in the northern parts of the island. That Adrian should deem it necessary to repair in person to so remote a portion of the empire, which then comprehended the richest provinces of the world, is however a proof that the Britons, although overpowered, were by no means reduced to patient subjection. Renouncing, therefore, a great part of the country included within the chain of forts of Agricola, Adrian constructed an earthen rampart across the island, between the mouths of the rivers Tyne and Edon. While these operations were in progress, the emperor fixed his residence in Eboracum, or York; but scarcely had he returned to the continent when the northern Britons, breaking through the second rampart thrown up against them, joined with the Brigantes in an endeavour to regain their independence. To repress those attempts, Lollius Urbicus was sent into Britain, who, repelling the natives beyond the Roman bounds, constructed a wall and towers on the line between the Forth and the Clyde, first fortified by Agricola. From this event, which happened about 140 until 183, Britain seemed to be tranquil: but then, while the empire was subject to the monster Commodus by the exertions of the natives, and the discontented spirit of the legions themselves, the power of the Romans in Britain was reduced to a very precarious situation. Pertinax, who had served in the island, and who, by his military talents, was fully qualified to restore the discipline and spirit of former times, was soon cut off by the licentious and disorderly Prætorian guards of Rome; and in 196, Septimius Severus became sole master of the empire. The Caledonians still continuing their efforts to rid themselves of the Roman yoke, Severus, although thus far advanced in life, and very unfit for the service of the field, found it necessary to repair to Britain. (See **YORK**.) In 207 he arrived at Eboracum, in the full determination to quell the restless spirit of the natives. After an expedition into the northern parts of the island, in which the loss of the Romans is admitted by their own historians to have been prodigious, he fixed his head-quarters in Eboracum; and commanded the rampart thrown up by Adrian between the Edon and the Tyne, to be powerfully strengthened, as Urbicus had done on the northern rampart with a continued wall and forts of stone. Taking advantage of his absence from the frontiers, the Caledonians again had recourse to arms: but in 211, while Severus was preparing in Eboracum to repel their assaults, he died, and his sons and successors Caracalla and Geta soon afterwards returned to Rome. Whatever might have been the inclinations of the Brigantes, however gladly they would have combined with their countrymen of the north, yet by the presence of the imperial court, officers, and troops, every effort on their part must have been instantly discovered and repressed. Under Carausius, Britain enjoyed some semblance of independence; but his assassination in the midst of his spirited projects enabled Constantius to subject Britain again to the Roman arms. Dying in Eboracum in 307, Constantius was succeeded in the western portion of the empire by his son Constantine, who was present at his death, and was immediately proclaimed emperor by the legions. For many years, the Brigantes with the other southern provinces of Britain seem to have been submissive to their masters; but in 364, the northern nations renewed their incursions, while the opposite part of the island was harassed by the predatory de-

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scents of the Saxons. Tranquillity was at last restored by Theodosius, whose son of the same name obtained the purple, and after a short reign died in 393. Diffusion within and assault from without were now fast hastening on the overthrow of the mighty empire of Rome; and in the middle of the fifth century of our era, the Romans finally relinquished all possession, power, and authority in Britain. Of their long protracted residence in Yorkshire, many unquestionable evidences are found in the capital, and in other parts of the county. The roads established by that extraordinary people may yet be traced, traversing the county in various directions. The whole system of the Roman policy and discipline was certainly directed to the perfection of their military power.

One great line of probably Roman road, which traverses the county of York from S. to N., is now called the Watling-street, (a name apparently Saxon,) which was opened from the Rutupian port, in the neighbourhood of Sandwich, in Kent, in various directions, all the way to the wall of Severus. Entering Yorkshire near Bawtry, it has been traced by Doncaster, (Danum, or the station on the river Don,) over Seawby and Pigburn Leas, to Barnsdale, through Pontefract to Cattleford, supposed to be the position of the ancient Legiolium, a little below the junction of the rivers Aire and Calder. From this point, the road was conducted by Calcaria, now Tadcaster, to Eboracum, or York. From this city it probably followed the N.E. side of the river Ouse, crossing it near to Ifurium, now Aldborough, below Boroughbridge, and thence by Leeming-lane to Catterick-bridge, adjoining to which vestiges of Cataractorium are to be seen; there turning more to the northward, it passed over the Tees at Pierfe-bridge into the county of Durham. Another military road is supposed to have been laid out from Mancunium, now Manchester, in a N.E. direction, by Wakefield, to join the former line between Doncaster and York. North-eastwardly from York a road seems to have been formed by or near Malton, terminating on the sea-coast at Dunsley bay, the Dunus bay of Ptolemy. This road is still called Wade's causeway, from the Saxon chief Wada, as Camden thinks, who resided on the coast in a castle, perhaps originally erected by the Romans. A branch of this road is supposed to have led to Scarborough, when the sheltered beach furnished a convenient place for Roman shipping. The freight course of an ancient road may be traced, although over the high grounds of the Wolds pointing from York towards Bridlington bay, corresponding probably to the Sinus Gabrantovicorum of the Romans; a branch has also been observed tending towards Hunnonby and Filey bay. Another line may also be followed in a direction to Patrington (Prætorium) and the Spurn-point, which seems to correspond with the Ocellum Promontorium of Ptolemy. From Lincoln (Lindum colonia) a Roman road may be traced running N. to the S. bank of the Humber near Winttingham, where are still seen vestiges of the station, ad Abum. On the N. bank, Brugh indicates the position of another ancient station, from which a branch of road probably communicated with York. This, however, is not the course indicated in the itineraries, which point out a much more convenient course from Lincoln to York, across the river Trent at Littleborough, the ancient Segelocum.

The vestiges of Roman works and occupation distributed over various parts of Yorkshire are by far too numerous to be mentioned in this place: it must therefore be sufficient to point out two, Cataractorium and Ifurium. About five miles below Richmond in Swaledale is the present village of Catterick, so named from the Cataractium of the Romans, of which the vestiges are visible on the S. bank of the river,

a little lower down the valley. Ifurium exhibits the most remarkable proofs of Roman habitation. Sixteen miles above York, and nearly one mile below Boroughbridge, on the S. bank of the river Ure, is Aldborough, so called in allusion to the old town, to which it has succeeded, named by the Romans Ifurium.

Castles.—Of these many still remain in Yorkshire, although in several cases they are either nearly demolished, or by later alterations, bear but little resemblance to their original form and structure: in some, indeed, the name alone is preserved. Of York castle, the keep, or Clifford's tower, is almost all that is to be seen above the surface of the ground. Scarborough castle is situated on a projecting precipitous cliff, 300 feet above the sea, and cut off by a deep natural hollow from the high ground behind it. Richmond has long been distinguished by its extensive castle, which was erected soon after the Norman Conquest by Alan, a kinsman of William the Conqueror, on receiving the vast possessions of the Saxon, Edwin, earl of Chester. Crake or Creyke castle, although belonging to the county of Durham, is situated only twelve miles N. from York, is of great antiquity; for so early as in 685, it was bestowed on St. Cuthbert by Egfrid, king of Northumberland. Six miles W. from Doncaster, are the castle and village of Conisburgh, or more properly Coningburgh. The castle, one of the most interesting edifices of the kind in the N. of England, a building of great extent and strength, is commanded by the high ground on which the village is placed. The area of the castle is in circuit about 700 feet, encompassed by a very deep ditch, now filled with trees. Of Knareburgh castle, once a fortress of importance, but few remains are now to be seen. It is believed to have been erected by Serlo de Burgh, who received the manor as a reward for his services at the Conquest. Pontefract castle, the scene of many transactions of note in English history, in particular of the murder of Richard II., is built on a lofty rock. Sheffield castle, formerly of great strength from its situation, between and at the meeting of the rivers Don and Sheaf, was levelled to the ground by the parliament in the civil wars. The ancient castle of Skipton, in the W. part of the county, is still in a habitable state. It now belongs to the earl of Thanet; but was formerly the residence of the powerful family of Clifford, of which Henry, the fourteenth lord, was, in 1525, created earl of Cumberland. Near the E. bank of the Darwent, S.E. from York, are the remains of the magnificent castle of Wresfle, supposed to have been erected by Percy, earl of Worcester, in the reign of Richard II., towards the end of the 14th century. Originally the castle formed a quadrangle, having a tower at each corner, and a fifth over the entrance. Wresfle was one of the places of residence of the great earls of Northumberland, where they lived in a style of splendour and magnificence, formed on the model and with the state of the royal household. Notwithstanding the zeal evinced by the earl of Northumberland in the cause of the parliament, the castle was, in 1650, dismantled. Three sides of the quadrangle were demolished, and an accidental fire in 1796 completed its destruction. The site belongs to the earl of Egremont.

Seats.—To describe the number of admirable structures of modern times, with which the county of York is adorned, would require a volume. In this place merely to notice some of the most eminent seats is all that can be attempted. About 13 miles N.N.E. from York is situated Cattle-Howard, the princely mansion of the earl of Carlisle, of the illustrious house of Howard. On the site of the ancient castle of Hinderstelf the present building was erected, about a century ago, by sir John Vanbrugh, the celebrated

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architect of Blenheim. Castle-Howard, in its general arrangement and appearance, bears an evident resemblance to that superb structure, and indicates the genius of that distinguished artist. In extent of front it exceeds Blenheim, and in exterior display of magnificence it is, perhaps, superior. The interior, spacious and lofty, is enriched with a very valuable assemblage of paintings by masters of the greatest celebrity; and the collection of antique statues, busts, &c. is peculiarly interesting. The surrounding park and grounds are distributed and ornamented in a way fuitable to the grandeur of the structure they inclose. Duncombe-park, the seat of Charles Slingsby Duncombe, esq., 22 miles N. from York, also erected by Vanbrugh, is splendid in itself, and splendidly adorned with paintings of the most eminent artists. Harewood-house, the residence of the earl of Harewood, six miles N. from Leeds, is a magnificent structure, commenced in 1760, in which are combined grandeur of design and ornament, with convenience and accommodation of arrangement. One of the greatest ornaments, not of Yorkshire only, but of the kingdom, is Wentworth-house, once the habitation of the distinguished patriot Charles marquis of Rockingham, from whom it descended to his nephew and heir the present earl Fitzwilliam. It is situated in a spacious park, four miles N.W. from Rotherham, and seven N.N.E. from Sheffield. The mansion extends in front about 600 feet, forming altogether a structure of uncommon magnificence. Nor is the interior deficient in appropriate arrangement and splendour. In approaching the house, the attention of the visitor is arrested by a noble mausoleum, raised in 1788, by the present earl, to the memory of his uncle, the marquis. This monument is placed on an eminence, and is in itself 90 feet in height, divided into three parts. The square Doric basement supports a similar structure of the Ionic order, with open arches on the sides exhibiting a sarcophagus; the whole surmounted by a cupola. Within the basement story is a chamber containing a statue of the marquis, by Nolckens. Around the walls are busts of eight of his principal political friends, C. J. Fox, sir G. Saville, &c. Wentworth-house, erected by the earl of Strafford in 1730, but now the seat of Henry Vernon, esq., is a noble fabric. Towards the southern border of the county, midway between Doncaster and Worktop, is Sandbeck, the superb mansion of the earl of Scarborough, erected nearly fifty years ago.

Ecclesiastical State.—A very important change in the condition of the ecclesiastical establishments in Yorkshire, and over England in general, was introduced by William I. Prior to the Conquest the Saxon prelates, with their archdeacons and other delegates, sat in the courts with the earls and sheriffs for the administration of justice; receiving with the lay-judges a share of the fines imposed on offenders. According to the original charter, however, still preserved among the records of the cathedral of Lincoln, the Conqueror declared, that no bishop or archdeacon should, in future, hold ecclesiastical pleas in the hundred-court, nor suffer any cause of a spiritual nature to come under the cognizance of secular persons. Whoever, therefore, offended against the canons of the church was to be tried by a tribunal, to be appointed by the bishop of each diocese. It was also strictly enjoined on all sheriffs, royal officers, or other lay persons, not to encroach on the episcopal jurisdiction. These regulations were afterwards confirmed, in a general council of the nation, by the bishops, abbots, and all the principal nobility; but those nobles and prelates were then almost all Normans or other foreigners. To this artful separation of the ecclesiastical from the civil jurisdiction, the jealousies, contrarities, contests, and open

ruptures, by which the kingdom was, on various occasions, brought almost to its ruin, must be ascribed. In addition to the dissensions occasioned in this way, the dispute respecting the superiority of the see of Canterbury over that of York was conducted with peculiar animosity, between the Norman prelates of both. In 1070, Thomas, a canon of Bayeux in Normandy, appointed to York, repaired to Canterbury for consecration from the hands of archbishop Lanfranc, who had been previously installed; but refusing to swear obedience to the see of Canterbury, the consecration did not take place. The famous Gregory VII. making it now a rule to confer the pall on no prelate who did not appear in person before him, the two contending English archbishops were required to present themselves in the court of Rome, where the dispute was referred for decision to a synod of the clergy of England. By this council, assembled at Windfor in 1072, a sentence amounting to a compromise was pronounced. The rights claimed by Canterbury were confirmed; but Lanfranc dispensed with the oath of obedience from Thomas of York. In his profession of obedience, however, Thomas acknowledged that the archbishops of York and their suffragans were bound to obey the mandate of the primate of Canterbury, when required to attend him in council, wherever it should be held. On the appointment to York of Thurstan, chaplain and secretary of Henry I. in 1115, the dispute was again revived; but in 1121, Thurstan, who had obtained favour at Rome, was permitted by Henry, whom his pertinacity had irritated, to return to York. It does not, however, appear that he ever made any satisfaction for his resistance to the claims of Canterbury; or that a profession of obedience to that see was ever made by any of his successors. From this time, therefore, York maintained its independency, and, a few years afterwards, had certain suffragan bishops placed under its authority. Roger of York, in 1162, procured a bull from Rome, granting him the privilege of crowning the kings of England, possessed by some of his predecessors, and of having his cross carried erect before him throughout the whole kingdom. But in 1165, in the reign of Henry II., the latter privilege was by pope Alexander III. restricted to Roger's peculiar province. Opposing claims were nevertheless advanced on both sides, until Edward III. by influence and management procured from Rome a confirmation of the arrangement he had accomplished between the contending prelates. Then was introduced the casual and silly distinction, still preserved, in the titles of the two metropolitans, by which the archbishop of York is styled primate of England, and his brother of Canterbury primate of all England.

The county of York is wholly and immediately under the superintendance of the archbishop, whose suffragans are the bishops of Carlisle, Chester, Durham, and the Isle of Man. The latter, styled bishop of Sodor (the southern isles of Scotland) and Man, presiding over a diocese not formerly pertaining to England, has no seat in the house of peers. Under the archbishop, ecclesiastical affairs are conducted by archdeacons; an office first introduced into the diocese, as it is said, by Thomas the Norman, appointed in 1070.

Fertile and extensive as is the county of York, the number of religious houses erected within its bounds, in former times, was prodigious. "These were in all," according to Burton, (*Monasticon Eboracense*), "106; viz. abbeyes 14, priories 44, alien priories 7, cells 13, and houses of friars of various orders 28." Of those establishments the ruins of many houses still exist; some of them exhibiting very picturesque and attractive monuments of ancient devotion and liberality. St. Mary's abbey adjoining to York gives sufficient indications

tions of its original grandeur. The abbots of St. Mary's and of Selby, both of the Benedictine order, were alone entitled to wear the mitre on the N. side of Trent. But for an account of these abbeys, and that of Whithy, the reader is referred to the description of the several towns in which they are situated. Of some others, erected in detached situations, a few may be here noticed. About three miles S.W. from Ripon are the magnificent and picturesque ruins of Fountain's abbey, of the Cistercian order, founded in 1132; and so named, not from any abundance of springs of water at the place, but from the village of Fontaines in Burgundy, where St. Bernard, the great patron of the order, was born. But the structure, of which the remains are so great an ornament to the country, was commenced in 1204. Built in the most elegant style of the ancient pointed architecture, the tower and the walls of the church still remain; the roof only being ruined. The length of the church was 351 feet, and that of the transept 186. The great tower, singularly situated at the N. end of the transept, is in height 166 feet. The whole edifice may be considered as one of the finest specimens of the simple but majestic style of the time of Henry III. and his successor Edward I. The abbey now forms a peculiar ornament to the celebrated grounds of Studley-Royal. On the N. bank of the river Aire, three miles to the westward of Leeds, are the remains of Kirkstall abbey, founded in 1147, by a colony of Cistercian monks from Fountain's abbey. The venerable remains of the Cistercian abbey of Rievall, or Rievaulx, are situated in a valley, about three miles northwards from Duncombe-park, from which they appear with peculiar advantage. Of the very ancient monastery of Ripon no part now exists. The collegiate church, or minster, still an interesting edifice, was partly rebuilt in the middle of the 14th century. Roche abbey, situated near lord Scarborough's seat of Sandbeck, in a deep narrow vale, is now reduced to a few arches, and a portion of the nave.

Authorities.—*Monasticon Eboracense*, or the Ecclesiastical History of Yorkshire, by John Burton, M.D. F.S.A. folio, 1758. *Topographical Dictionary of Yorkshire*, by Thomas Langdale, 8vo. 1809. *Eboracum, or the History and Antiquities of the City of York*, by Francis Drake, F.R.S. and F.S.A. folio, 1736. *History of Cleveland*, by the Rev. John Graves, 4to. 1808. *History and Antiquities of the Deanery of Craven*, by T. D. Whitaker, LL.D. F.S.A. 4to. 1812. *General View of the Agriculture of the North Riding of Yorkshire*, by Mr. Tuke, 4to. 1794. *Ditto of East Riding*, by Isaac Latham, Esq. 8vo. 1794. *Ditto of West Riding*, by Messrs. Rennie, Brown, and Sheriff, 8vo. 1794.

YORKSHIRE Cows, in *Rural Economy*, a term sometimes applied to a large short-horned breed of these cattle, which afford much milk, but which is not of the most rich kind, and which are much produced on the fine pastures in that district. See *Cow* and *LIVE-Stock*.

YORKSHIRE White, in *Agriculture*, a perennial grass that thrives well in moist situations, and which grows very generally on all soils, except those that are of the moist barren and dry qualities. It flowers in the middle of the summer, and is well calculated for sheep, as it answers uncommonly well when closely fed down. It is said not to be much relished by neat cattle, and considered injurious to horses, which, in some cases, are supposed to become affected with a profuse discharge of urine and general weakness in consequence of the use of it. But should any hay, made from this grass, be accidentally given to these animals, and produce these effects, an immediate change of the fodder will

prevent any further bad consequences. Its foliage is rather soft and woolly.

The proportional value which the grass at the time the seed is ripe bears to that at the time of flowering, is as 11 to 12.

It is a useful sort of grass in many cases of laying land down to pasture and other such purposes. See *HOLCUS Lanatus*.

YO-SANPOO, in *Geography*. See *SANPOO*.

YO-TCHEOU, a city of China, of the first rank, in the province of Hou-quang, situated on the Yang-tse river, and on the Tong-ting lake. This lake, which resembles a sea, is remarkable for the greatness of its circuit, which is more than 210 miles; for the quantity of its water, especially in certain seasons, in which the two great rivers of the provinces swelled with rains, discharge themselves into it, passing out on the other side sensibly diminished; and for its astonishing quantity of fine fish which are caught therein. The great number of barks and merchandizes which are brought thither render it one of the richest cities in the empire; its districts contain one town of the second order, and seven of the third; some on the east side of the lake, and others on the west. The country round is every where extremely fruitful, and full of different kinds of orange and lemon trees; 675 miles S. of Peking. N. lat. 29° 23'. E. long. 112° 35'.

YOUB, EL, a town of Algiers; 50 miles S.W. of Tremecen.

YOUGH GLADES, a post-town of Maryland; 173 miles N.W. of Washington.

YOUGHAL, a sea-port, borough, and post-town of the county of Cork, Ireland, situated at the mouth of the river Blackwater, in the eastern part of the county. Youghal is an ancient corporation, and sends a member to the united parliament. It is one of the towns belonging to the duke of Devonshire, as heir of the eldest branch of the Boyle family. It has a considerable corn trade, and is much frequented for bathing. There is a collegiate church, the wardenship of which is united to the see of Cloyne. Youghal is 115 miles S.W. from Dublin, and 25 E. from Cork.

YOUHIOGENY, a river of America, which rises in the north part of Virginia, and runs into the Alleghany, at Pittsburgh.

YOVIS, a town of Africa, in the county of Whidah; 9 miles E.N.E. of Sabi.

YOULE, a river of Madagascar, which runs into the sea on the west coast, S. lat. 20° 20'. E. long. 44° 40'.

YOUNG, EDWARD, in *Biography*, a celebrated poet and clergyman of the established church, was born at his father's living of Upham, in Hampshire, in 1684, and removed from Winchester school to New college, in the university of Oxford in 1703, and afterwards to Corpus Christi college. In 1708 he obtained a law-fellowship at All Souls by the patronage of archbishop Tenison, and at this time poetry was the chief object of his pursuit. His first performance in this department was "An Epistle to Lord Lansdown," one of the twelve peers created at the same time in 1712; and this was followed in the next year by his "Last Day," to which he prefixed a dedication to queen Anne, extolling the peace of Utrecht. From this circumstance he was regarded as a court-writer with a fixed stipend, under which character Swift alludes to him in his "Rhapsody on Poetry."

"Where Y— must torture his invention
To flatter knaves, or lose his pension."

His next production was "The Force of Religion, or Vanquished Love," founded on the story of lady Jane Gray; and in 1714, he inscribed a poem on the death of the queen and the accession of George I. to Addison, who was then secretary to the lords justices. In 1719 he became tutor to the eldest son of the earl of Exeter; but soon abandoning that connection by the solicitations of the duke of Wharton, he graduated doctor of civil laws in this year, and wrote his tragedy of "Busiris, King of Egypt," which was dedicated to the duke of Newcastle, and favourably received; and in the same year he dedicated in a very complimentary strain to lord chancellor Parker, his poetical "Paraphrase on Part of the Book of Job." In the year 1721 his tragedy, "The Revenge," was exhibited with great applause, and dedicated to the duke of Wharton, whom he avows as his peculiar patron, and from whom he received some pecuniary favours. His satires, entitled "The Love of Fame, or the Universal Passion," were separately published, from 1725 to 1728, and as they became popular, he derived from them considerable profit. In 1726 he addressed his poem, entitled "The Infalliment," to sir Robert Walpole, on his receiving the honour of the Garter; and he availed himself, on the accession of king George II., of his recommending an attention to the navy, to compose two odes, one inscribed "To the King, Pater Patriæ," introducing another under the title of "Ocean." Having attained his 44th year, he took orders, and in 1728 was nominated one of the royal chaplains; and this change of his views and pursuits induced him to withdraw from the stage his tragedy of "The Brothers," which was under rehearsal. His next publications were adapted to his new profession; and among these were his "True Estimate of Human Life," exhibiting the dark side of the picture; and a sermon preached before the house of commons on the 30th of January, entitled "An Apology for Princes, or the Reverence due to Government;" a subject not unappropriate to his situation as royal chaplain. In 1730, Dr. Young was presented by his college to the rectory of Welwyn, in Hertfordshire; and in the following year he married lady Elizabeth Lee, widow of colonel Lee, and daughter of the earl of Lichfield. Before this time he had resumed his poetical pen, and written "Imperium Pelagi, a Naval Lyric;" "Two Epistles to Mr. Pope, concerning the Authors of the Age;" and "The Sea-Piece," in two odes, dedicated to Voltaire. By his wife, who died in 1741, he had one son; and this circumstance, together with some other domestic losses that occurred about the same period, increased that melancholy and depression of mind to which he was constitutionally inclined. When he married lady Lee, she had a son, and also two daughters, the eldest of whom, denominated by him Narcissa, falling into a decline, went to the south of France, and died at Lyons in 1736. Her husband, Mr. Temple, supposed to be the poet's Philander, died in 1740; and his own lady died in 1741. If he referred to these events in the annexed lines, he must have taken a chronological licence hardly allowable even to a poet:

"Infatiate archer! could not one suffice?
Thy shaft flew *thrice*, and *thrice* my peace was slain;
And *thrice*, ere *thrice* yon moon had filled her horn."

It is certain that he began to write his "Night Thoughts" in the year 1741; and the occasion, as he declares, was real, and not fictitious. The seventh of these poems is dated in 1744, and the interval must have been occupied in the composition of them. Notwithstanding

the sublime strains in which the author expresses his pious feeling, he is not regardless of the patronage of distinguished persons, for to such he inscribes them. On this work Dr. Young bestowed much attention and labour, and he valued it as the chief of his productions. Among his other works, we may mention a poem written as an expression of his loyalty in 1745, and entitled "Some Thoughts occasioned by the present Juncture, inscribed to the Duke of Newcastle;" "The Centaur not fabulous, in Six Letters to a Friend, on the Life in Vogue;" an overcharged picture of the existing manners; and "A Sermon preached before their Majesties," with a dedication to the king, 1758. Dr. Young, notwithstanding his genius and piety, and his solicitude to obtain preferment, seems to have been disregarded; and though archbishop Secker expresses his surprise that he had been overlooked by persons in power, he declines any interference in his favour. It should be recollected, however, that the attention which he paid to Frederick, prince of Wales, during his variance with his father, was not forgotten; nor indeed would his junction of the poetical and clerical character be any recommendation to George II. But the reason of his name's being struck out of the list of court-chaplains on the accession of his present majesty is not known; it is the more unaccountable, as he was soon after appointed clerk of the closet to the princess dowager of Wales.

In his retreat at Welwyn he maintained a respectable and dignified character; and though the cast of his mind seems to have been gloomy, he was an agreeable and lively companion. The close of his life, however, was rather disconsolate than cheerful. The conduct of his only son, supposed to be the Lorenzo of the Night Thoughts, who is said to have been a rake and free-thinker, afforded him renewed opportunities for reproof and sarcasm, and must have been the occasion of poignant grief; though Mr. H. Croft vindicates his character, alleging that he was only eight years old when his father began that poem. But others have asserted that he was alarmed and grieved on his account; and that, notwithstanding the favourable change which took place in his sentiments and character, his father would not admit him to any interview in his latter years: and even on his death-bed he refused to see him, though he assured him of his forgiveness, and made him his heir. Towards the close of his life, he surrendered himself to the influence of a housekeeper, and from some mismanagement in his concerns, and a growing disposition to avarice, he became irritable in temper and depressed in spirits. His last production was a poem, entitled "Resignation," printed in 1762, which indicated the decline of his mental powers. His life was prolonged to the year 1765, and he then died in his 84th year. He was interred in the church of Welwyn, and his son erected a monument near the remains of both his parents.

Dr. Young is known principally, if not wholly, as a poet; and his compositions in this department are distributed into satires, tragedies, and night thoughts. His satires are founded on the questionable principle, that the love of fame is the universal passion of mankind; and as he did not excel in judgment, they are exercises of wit and invention rather than grave exposures of vice and folly. As a dramatic writer, he is charged with not understanding or not adhering to nature, and with indulging his imagination and feeling, and running into exaggeration of character and bombast of expression. The only tragedy that has kept possession of the stage is his "Revenge," the Zanga of which is said to have no competitor for theatric effect

effect among the personages of modern tragedies. His "Night Thoughts" were deemed original in design and execution. Whatever were the causes that produced them, they are adapted to excite devout feeling, and to produce moral effect, though they are justly complained of as in some places unintelligible, and as affording too much scope for criticism. To many readers, the theology on which they are founded and which they express is too awful and severe, and not so well calculated to soothe and pacify the human mind under trouble as the gentler and more consolatory dictates of Christianity. They are sometimes tedious and prolix. They will never be neglected as long as taste and susceptibility of virtuous and religious impressions remain. The lyric attempts of Dr. Young are said to have been singularly unfortunate. From the edition of his works published in his life-time in 4 vols. 8vo., he himself excluded several compositions which he thought of inferior merit. Biog. Brit. Croft's Life of Young in Johnson's English Poets. Gen. Biog.

YOUNG, PATRICK, (*Patricius Junius*, Lat.), an eminent scholar, was born in 1584, at the seat of his father, sir Peter Young, who had been co-tutor with Buchanan to James VI. of Scotland, at Seaton in Lothian. Educated in the university of St. Andrew's, and accompanying his father in the suite of king James, he was employed for some time as librarian and secretary, by Dr. Lloyd, bishop of Chester. In 1605 he assumed the degree of M.A. which he had before taken at St. Andrew's, and entering into orders, became chaplain at All Souls' college. During his residence at Oxford he occupied himself in the study of ecclesiastical history and antiquities, and also the Greek language; and upon his removal to London, he obtained a pension of 50*l.* a year, and was occasionally employed by the king and persons in power in writing Latin letters. His patron was Montagu, bishop of Bath and Wells, who procured for him the appointment of librarian to the king. In 1617 he was introduced at Paris, by the recommendation of Camden, to the learned men of that city; and upon his return, he assisted Thomas Rhead in making a Latin version of the works of king James. In 1620 he married, and afterwards was advanced to several preferments in the church; and succeeded Rhead in 1624 as Latin secretary. Unknown by any publication, he was nevertheless honoured as a person of distinguished literature, who rendered acceptable and useful services to learned men. In this way, he was the coadjutor of Selden in the examination of the Arundelian marbles; and when they were published by this celebrated antiquary, he dedicated the work to Young. He was also employed in collating the Alexandrian MS. of the Bible with other copies; and as the result of his labours, he communicated many various readings to Grotius, Usher, and other persons. It was his intention to have edited a fac-simile of this MS., but his design was never executed. He published, however, in 1633, from this MS. the "Epistles of Clemens Romanus," and he proposed editing the curious MSS. from the king's library; but the civil wars, and the seizure of the royal library, prevented the accomplishment of his purpose. During the troubles of this period, he sought an asylum with a son-in-law, at Bromfield in Essex, where he died in 1652.

Young is said to have indulged to excess a disposition to oblige, which led him to lend valuable MSS. belonging to the royal library to foreigners and others; and he has been charged with betraying his trust, by not returning MSS. which he removed to his own house in contemplation of the pillage of the library, and these were sold among his other effects. To obviate this imputation, it has been alleged

that he purchased for himself many MSS. from Greeks who visited this country. Smith's Vit. Erudit. Viror. Gen. Biog.

YOUNG is a name borne by many persons connected with and remarkable in some way or other for useful talents in the arts. Charles Young, organist of Catharine-cree church, near the Tower, father of three daughters, who were all public singers: Cæcilia, the eldest, was an élève of Geminiani, spoke Italian well, sung in many of Handel's later operas, and was afterwards married to Dr. Arne; the second Miss Young, Isabella, was married to the ingenious and excellent composer Mr. Lampe, who set the Dragon of Wantley; and the third Miss Young, Elster, afterwards Mrs. Jones, sung on the stage at Covent-Garden theatre to the time of their deaths. Charles, the father of these ladies, was, we believe, the son of Anthony Young, a musician and music-feller in St. Paul's church-yard, commonly called Tony Young, who has been said by some of the family to have set "God save great George our King." But at the time of the rebellion of 1745, when this air was revived, which Dr. Arne's mother assured us was written and set for king James II., when the prince of Orange was hovering over the coast previous to the Revolution; no claim was then made by the descendants of Anthony Young, or of any other composer of this air, which no one durst sing or own after the abdication of king James, without incurring the penalty of treason to king William; so that the song or hymn lay dormant, and the author concealed for near sixty years, before it was applied to king George II.

There is a quibbling glee in the first volume of Purcell's catches on two persons of the name of Young, father and son, who lived in St. Paul's church-yard; the one was an instrument-maker, and the other an excellent performer on the violin:

"You scrappers that want a good fiddle well frung,
You must go to the man that is old while he's Young,
But if this same fiddle you fain would play bold,
You must go to his son, who'll be Young when he's old.
There's old Young and young Young, both men of
renown,
Old fells, and young plays, the best fiddle in town;
Young and old live together, and may they live long,
Young to play an old fiddle, old to fell a new fong."

Another Young, of the same family, the proprietor of a music-shop in St. Paul's church-yard till the middle of the last century, had a relation, an excellent performer on the violin, known by the name of *Chin-Young*, from the length of that feature, who led at almost all the concerts within Temple-bar, particularly at the Blue-coat school chapel, Christ's hospital, on a Sunday evening, where there used to be a performance of sacred music.

Miss Young, afterwards the hon. Mrs. Scot, and her sister Mrs. Bartleman, both public singers, seem to have been the last remains of the musical family of Young.

YOUNG. See GENERATION, CONCEPTION, GESTATION, EMBRYO, FÆTUS, DELIVERY, CHILD, &c.

In the army, that regiment, or officer, is said to be the *younger, junior*, which was last raised, or whose commission is of latest date, whatever be the age of the man, or however long he may have served in other capacities.

YOUNG *Plantations, Securing and Sheltering of*, in *Rural Economy*. See PLANTATION and SHELTERING.

YOUNG *Frederick's Island*, in *Geography*, a small island among Queen Charlotte's islands, in Port Ingraham.

YOUNG *Nick's Head*, a cape on the east coast of New Zealand, so called from Nicholas Young, a boy on board the

the Endeavour, who discovered it in 1769. It forms the fourth-west point of Poverty bay.

YOUNG Point, a cape on the east coast of St. Vincent. N. lat. 13° 12'. W. long. 61° 9'.

YOUNG'S Island, a small island near the fourth coast of the island of St. Vincent; 2 miles S.E. of Kington bay.

YOUNGE, NICHOLAS, in *Musical History*, an Italian merchant, the editor of "Musica Tranfalpina," 1588; Madrigales of four, five, and six parts, chosen out of divers excellent Authours; with the first and second part of La Virginella, made by Maister Bird upon two Stanzas of Ariosto, and brought to speak English with the rest. The editor having opportunities of obtaining from his correspondents the newest and best compositions from the continent, had them frequently performed at his house, for the entertainment of his musical friends.

The second collection of the same kind was published by the same editor in 1597; in which, among others, there are three madrigals by Crou, three by Luca Marenzio, and six by the elder Ferrabosco. These two collections being selected from the works of Palestrina, Luca Marenzio, and other celebrated masters on the continent, seem to have given birth to that passion for madrigals which became so prevalent among us afterwards, and which the composers of our own country endeavoured with such zeal to gratify.

If allowance be made for the wretched state of lyric poetry in England at the time the madrigals published in Younge's two collections were translated, which was long before the publication of the sonnets of Spenser or Shakespeare, the undertaking seems to have been tolerably executed. Indeed, sometimes with such care and felicity as to transfuse the expression of the original words into that of the version. The Italians themselves, at this time, had but little melody or rhyme in their music; but their poetry having been long cultivated, and brought to a much greater degree of perfection than ours could then boast, it indicated to the musical composer traits of melody, more airy and marked, perhaps, than we could derive from the prosody or phraseology of our own language. The translator of these madrigals, whoever he was, for the editor does not tell us, seems in general to have imitated the original Italian measure and structure of verse, as well as ideas; and though they abound with *conceits*, to which not only Italian poets, but those of all the rest of Europe were then so much addicted, the general taste of the times was indulged in poetry as well as music, and metre and melody were at once furnished with new models.

However, the perpetual double rhymes in Italian madrigals and sonnets have so much distressed our translator to supply them in English, that, as the preservation of the original music obliged him to render his version *totidem syllabis*, his embarrassments on this account are sometimes truly ridiculous. It seems as if the constant double rhymes in Italian poetry, which throw the accent on the penultima, instead of the final syllable, of a verse, gave a peculiar cast to the melody in which it is clothed, and rendered it specifically different from that of English songs, in which but few double rhymes occur. The constant and regular mixture of masculine and feminine rhymes in French poetry may likewise have had a latent effect on the vocal melody of France, different from that of the other two neighbouring nations. But, after mentioning these suspicions, we shall leave the further investigation of so subtle a subject to philosophers, not only possessed of the necessary knowledge, but an equal zeal for the cultivation of philology, poetry, and music. No. 7, in Younge's second publication of Italian madrigals Englished, in which the old Saxon termination of the present

tense of the indicative mood of our verbs is conveniently preserved, was doubtless not thought the worst, as it is applied to several compositions in the collection.

"In vayne he seeks for beauty that excelleth,
That hath not sene hir eyes where love seorneth,
How sweetly here and there the fame she turneth.

He knows not how love heateth, and he quelleth,
That knows not how the fighes, and sweet beguileth,
And how she sweetly speakes, and sweetly smileth."

These madrigals were celebrated, nearly forty years after their publication, by Peacham, who has pointed out the peculiar excellence of several, particularly those of Luca Marenzio, which, he says, "are songs the muses themselves might not have been ashamed to have composed;" and of those by Alfonso Ferrabosco, the father, he says, "they cannot be bettered for sweetness of ayre and depth of judgment." Upon the ditty (words) of one of these, "I saw my Ladie weeping," (he says) Maister Byrd and Alfonso, in a friendly emulation, exercised their invention." The words of the Nightingale, and Fayre Sufanna, were so much admired, that they seem to have been set by all the best composers of the times. A few lines of each will perhaps convey to the reader an adequate idea of the poetical beauty of these favourite songs.

The Nightingale.

"But my poore hart with sorrowes over-swelling,
Through bondage vyle, binding my freedom short,
No pleasure takes in these his sports excelling,
Nor of his song receiveth no comfort."

Fayre Sufanna.

"To them she sayd, if I, by craft procur'd,
Do yeld to you my body to abuse it,
I lose my soule; and if I shall refuse it,
You will me judge to death reproachfully.
But better it is in innocencie to chuse it,
Then by my fault t'offend my God on hye."

Indeed, in more than twenty sets, published between the years 1588 and 1624, during a period of near forty years, including almost four hundred and fifty madrigals and songs in parts, it would be difficult to find any one of which the words can be perused with pleasure. The sonnets of Spenser and Shakespeare, many of which are worthy of their authors, were indeed not published till about the end of the sixteenth century; but afterwards, it is wonderful, that, except one by Shakespeare, none of them were set by our best musical composers of their time.

YOUNGOULE, in *Geography*, a sea-port town, on the west coast of the island of Madagafcar. S. lat. 23° 30'. E. long. 47° 4'.

YOUNGSTOWN, a township of the state of Ohio, in the county of Trumbull, with 773 inhabitants; 66 miles N. of Pittsburgh.

YOUNGSTOWN, an inconsiderable settlement called a village in Cambria, Niagara county, and state of New York, 1 mile from Fort Niagara, and 6 from Lewiston, containing about six or eight houses.

YOUNKERS, among *Sailors*, are the younger sailors, otherwise called *foremast-men*; whose business is to take in the top-fails, furl the sails, sling the yards, &c.

YOURE, in *Geography*. See URE.

YOURI, a town of Africa, in the kingdom of Cahna. N. lat. 16° 15'. E. long. 11° 2'.

YOUTH,

YOUTH, *Adolescence.* See AGE and ADOLESCENCE.

The renovation of youth has been much fought after by chemical adepts; and many of them pretended to various secrets for this purpose: but unluckily the death of the pretenders proved a sufficient refutation of their doctrine. Paracelsus talks of the mighty things he could do with his *ens primum*; and even Mr. Boyle tells us some strange things about the *ens primum* of balm. (Boyle's Works abr. vol. i. p. 75.) But Mr. Boyle gives these wonderful stories on the credit of a French chemist, and not on his own.

YOUTH, *Juventus, or Juventas,* in the *Pagan Theology*, a goddess worshipped among the Romans, who, together with the gods Mars and Terminus, kept her place in the Capitol along with Jupiter, when the other deities were turned out; whence the Romans drew a lucky omen for the durableness of their empire. Mem. Acad. Inscrip. vol. i. p. 71. seq.

This state of life was, by the ancients, compared to autumn. In which sense, Horace speaking of one approaching to puberty, says,

“ ——— Jam tibi lividos
Distinguet autumnus racementos,
Purpureo varius colore.”

The moderns, on the contrary, when they speak of one in the autumn of his age, mean one that is upon the decline; and choose rather to use the comparison of the spring, to denote youth.

YOWRY, in Geography, a small island in the East Indian sea, near the north coast of New Guinea, on which a nutmeg-tree was found growing by captain Forrest. S. lat. 15°. E. long. 130° 45'.

YPAWA, a river of Bohemia, which runs into the Elbe, near its source.

YPERLEE, a river of France, which rises near Ypres, and runs into the canal of Nieuport.

YPOLOTE, a town on the E. coast of the island of Paraguy. N. lat. 8° 46'. E. long. 118° 21'.

YPRES, or IPRES, a city of France, in the department of the Lys, situated on the river Yperlee, from whence it takes its name. Before the year 800, it was only a chateau, which was sacked and ruined by the Normans. Baldwin III. comte of Flanders, repaired the chateau, and built a town about the year 960, which was afterwards enlarged by Thierry, comte of Flanders, and Ferrand, the son of Sanchez, king of Portugal. In the year 1325, the inhabitants revolted with most part of the neighbouring towns against Louis de Nevers, comte of Flanders, and pulled down the old wall to build a new one, in which they inclosed the faubourgs, which had become so extremely populous, from weavers and other tradespeople, that in the year 1242, the number of persons amounted to 200,000. In the 14th century, the inhabitants of Ypres, for the most part weavers, were exceedingly troublesome to their neighbours, being unwilling that any people should carry on trade besides themselves. In the year 1383, the rebels of Ghent, assisted by the English, under the command of the bishop of Norwich, besieged this town with great vigour for six weeks, but were compelled to retire; and the English being obliged to quit Flanders, Philip the Hardy, duke of Burgundy, having become master by a marriage with the heiress of the late comte Louis, enlarged it, and surrounded it with walls. It was erected into a bishopric under the archbishop of Malines, by pope Paul IV. in the year 1559. The town-house is a very large building, forming a square, and is said to have been built by the English, 600 feet

in front; it has a very handsome tower, in which were kept their public archives from the year 1342. Besides the cathedral, it has several other churches, and some religious houses. The inhabitants carried on formerly a great trade in woollen cloth, but by the severity of the duke of Alva, the principal manufacturers were driven to England, from which time that branch of trade declined. At this time they carry on a considerable manufacture of linen of excellent fabric; 4 miles N.W. of Lisle. N. lat. 50° 48'. E. long. 2° 53'.

YPSILOIDES, *ἰψιλῶδες,* in *Anatomy*, the third genuine figure of the cranium; thus called from its resembling a Greek ψ , or upsilon.

Some also call it $\lambda\alpha\mu\delta\delta\omicron\iota\delta\eta\varsigma$, *lambdoides*.

There is also a bone at the root of the tongue, called *ypsiloides*, and *hyoides*. See HYOIDES.

YQUETAYA, in Natural History, a plant growing in Brazil, long used as a medicine in that country; and lately discovered to the Europeans by a French surgeon.

It has been since found in France; where, being cultivated and examined by Marchant, it appears to be no other than the common water-betony, or *scrophularia aquatica*.

It has this remarkable property, that it takes away from fena all its ill taste and smell; which property of correcting the infusion of fena was before wholly unknown.

To use this plant, it must be dried ten or twelve days in the shade, and afterwards exposed to the sun, till quite dry.

YRAME, in Geography, a town of Arabia, in the province of Yemen; 100 miles N.N.E. of Aden.

YRIARTE, Don JOHN DE, in Biography, was born in the Isle of Tenerife in 1702, and having completed his education at Paris and Rouen, settled at Madrid; where he occupied several literary offices, and particularly that of librarian to the king. His life terminated, to the regret of those who knew his worth, in 1771. Among his learned works, the principal are, “*Palæographia Græca*,” 4to.; “*Miscellaneous Pieces in Spanish, with Latin Poems*,” 2 vols. 4to.; “*A Catalogue of Greek MSS. in the Royal Library*,” and “*A Catalogue of Arabic MSS. in the Escorial*,” 2 vols. fol. Nouv. Dict. Hist.

YROUER, in Geography, a town of France, in the department of the Yonne; 5 miles S. of Tonnerre.

YRSEE ABBEY, a princely abbey of Germany, in the circle of Swabia, founded in the year 1182. The territory includes the village of Yrsee, and seven others. In 1802, this abbey was given among the indemnities to the elector of Bavaria; 3 miles N.W. of Kaufbeuren.

YRVILLAC, a town of France, in the department of the Finistère; 3 miles S. of Landerneau.

YRUN, a town of Spain, in Guipuzcoa; 2 miles S. of Fontarabia.

YRVON, a river of Wales, in the county of Brecknock, which runs into the Wye, at Builth.

YS, in Ichthyology, a name given by Athenæus, and some other of the Greek writers, to the fish called *mus* and *fus* by others. It is the capricus of later writers. See GOAT-Fish.

YSAMBRA, a word used by some as a name for hellebore, and by others to express a species of poison prepared in Spain, of which hellebore is an ingredient.

YSARD, in Zoology, a name given to the chamois.

YSCHE, in Geography, a river of France, which runs into the Dyle, 6 miles S. of Louvain.

YSENDYCK, or ISENDYCK, a town and fortrefs of Flanders, situated on the side or arm of the Scheldt, called the

the Blie: it was built near a town called Gasterneffe, swallowed up by an inundation of the sea some centuries ago, whose inhabitants came to establish themselves at this place. The Dutch made themselves masters of it in the year 1604, and since that time it has been strongly fortified, by which it is much assisted by its situation, being surrounded by morasses, which they can lay under water at pleasure; 8 miles E. of Sluys. N. lat. $51^{\circ} 21'$. E. long. $3^{\circ} 28'$.

YSIORTAM, in *Ancient Geography*, a place of Asia, in Armenia, which had a Roman garrison.

YSNI, in *Geography*. See ISNY.

YSOPUS, a term used by some to express the chemical art of separation.

YSPAR, a name by which some of the chemical writers call iron.

YSSANDON, JEAN, in *Musical Biography*, born at Lefart, in the Comté de Foix, wrote "A Treatise on Practical Music, divided in Two Parts." This book is become very scarce, and deserves to be reprinted. It was first printed by Ballard in 1582. Laborde.

YSSEL, in *Geography*. See ISSEL.

YSSENCEAUX. See ISSENCEAUX.

YSTAD, or YDSTAD, a sea-port town of Sweden, on the fourth coast of the province of Schonen, from whence a packet sails to Stralfund. It was formerly well fortified, and contained two churches. The harbour is neither large nor safe; 26 miles S.E. of Lund. N. lat. $55^{\circ} 22'$. E. long. $13^{\circ} 44'$.

YSTLA, a town of North America, in the province of Mexico.

YSTWITH. See ISTWITH.

Y-TCHANG, a town of Corea; 35 miles W.N.W. of Kang-tcheou.

Y-TCHUUN, a town of Corea; 15 miles S.S.W. of Ou-tcheou.—Also, a town of Corea; 55 miles N. of King-ki-tao.

YTHAN, a river of Scotland, a few miles N. of the Don, that joins the sea, about two miles from Aberdeen, which falls into the German ocean. The Ythan is a stream formerly celebrated for its pearl fisheries, of which some relics are now found.

YTHER, a river of Wales, which runs into the Wye, 3 miles N. of Builth.

YTERON, a small island in the gulf of Bothnia. N. lat. $63^{\circ} 4'$.

YTTRA BERGON, a small island on the W. side of the gulf of Bothnia. N. lat. $61^{\circ} 48'$. E. long. $17^{\circ} 13'$.

YTTRIA, or ITTRIA, in *Chemistry*, is a peculiar elementary substance usually considered as an earth.

Ytria has been hitherto met with in a peculiar mineral named GADOLINITE, so named from professor Gadolin, who first analysed it, and in YTRO-TANTALITE, both minerals found only in Sweden. See those articles.

Ytria has the appearance of a fine white powder, without taste or smell. It does not affect vegetable blues. Its specific gravity is considerably higher than that of the other earths, being no less, according to Ekeberg, than 4.842.

Ytria is insoluble in water, yet, like alumina, it is capable, according to Klaproth, of combining with nearly one-third of its weight of that fluid when precipitated from a state of solution by the muriatic acid.

In solutions of the pure alkalis it is likewise insoluble; but in the carbonate of ammonia, and indeed in all the alkaline carbonates, it dissolves readily. It combines with acids, and forms with them salts, which, as far as they are known, are described below.

Ytria is not affected by light, and probably does not

combine with oxygen. According to the experiments of Klaproth, it does not combine readily with sulphur.

Sir Humphrey Davy found, that when potassium was passed through red hot yttria, it was converted into potash, while grey metallic particles were perceived mixed with the alkali, which were considered to be the metallic basis of the earth or yttrium. Nothing further, however, is known respecting this metallic basis.

The Salts of Ytria are but little known. The following only have been examined.

Nitrate of Ytria.—This salt was first formed by Ekeberg, and has been more lately examined by Vauquelin. It may be prepared by dissolving yttria in nitric acid. The solution has a sweet astringent taste, and can scarcely be made to crystallize. Exposed to the air, it deliquesces. When sulphuric acid is poured into the solution, crystals of sulphate of yttria are instantly precipitated.

Carbonate of Ytria.—This salt may be formed by precipitating yttria from its solution in acids by means of an alkaline carbonate. It is white tasteless insoluble powder, composed, according to Klaproth, of

Carbonic acid	-	18
Ytria	-	55
Water	-	27
		<hr/>
		100

According to Vauquelin, however, it loses only 32 per cent. when calcined.

Phosphate of Ytria.—Vauquelin formed this salt by mixing a solution of the phosphate of soda with the sulphate, nitrate, or muriate of yttria. The phosphate of yttria precipitated in the form of gelatinous flakes.

Sulphate of Ytria.—Sulphuric acid dissolves yttria readily. As the solution proceeds, the sulphate crystallizes in small brilliant grains. Ekeberg fuses these crystals to be flat six-sided prisms, terminated by four-sided summits. Dr. Thomson obtained these in the form of long slender rhomboidal prisms. Their colour is amethyst-red: their specific gravity 2.791. They are soluble in about 30 parts of water at 60° . A red heat partly decomposes them. Oxalic acid, prussiate of potash, and infusion of nutgalls, occasion a precipitate in the aqueous solution of this salt. It is decomposed by the phosphate of soda. The sulphate of Glucina is readily distinguished from this salt by its being colourless, lighter, and more soluble in water. According to Berzelius, the sulphate of yttria is composed of

Sulphuric acid	-	50.0
Ytria	-	50.0
		<hr/>
		100.0

Arseniate of Ytria.—When yttria is dissolved in arsenic acid, and the solution boiled, arseniate of yttria precipitates in the form of a white powder. Arseniate of potash also precipitates yttria from acids.

Chromate of Ytria.—Chromic acid dissolves yttria cold in considerable quantity, and with effervescence. The solution has an astringent and pungent taste, and, like most of the chromates, has an orange-red colour, passing into yellow. The solution is quite neutral. When evaporated, it forms minute prismatic and cubic crystals. It is very soluble in water.

Acetate of Ytria.—Ytria dissolves readily in acetic acid, and the solution on evaporation yields crystals of the acetate of yttria, the form of which is usually that of thick six-sided plates,

plates, obliquely truncated. Their colour is amethyst-red, and they are not altered by exposure to the air.

Succinate of Yttria.—Yttria is not precipitated from its solution in acids by the fuccinates, unless the two salts be concentrated, in which case small cubic crystals fall, which are the succinate of yttria.

Oxalate of Yttria.—When oxalic acid, or the oxalate of ammonia, is dropped into a solution of yttria in an acid, a white infoluble powder falls, which is the oxalate of yttria. According to Vauquelin, this salt is composed of

Oxalic acid	-	-	57.5
Yttria	-	-	42.5
			100

Tartrate of Yttria.—Yttria is precipitated from its solution in acids by the tartrate of potash, but the precipitate is dissolved by the addition of water.

Dr. Thomson infers, from the analyses above-mentioned, and more especially from the analysis of the sulphate and carbonate by Berzelius and Vauquelin, that the combining weight or weight of the atom of yttria is 50, oxygen by 10, and consequently that it is composed of

Yttrium	-	-	80
Oxygen	-	-	20
			100

and the weight of the atom of yttrium will be 40.

With respect to the salts of yttria in general, it may be said, that many of them are little soluble; that they are capable of being precipitated from acids by the phosphate of soda, the carbonate of soda, the oxalate of ammonia, the tartrate of potash, and the prussiate of potash; and lastly, that the sulphate of yttria may be distinguished from the sulphate of lime by its greater solubility, and by its sweet taste.

YTTRIUM, the metallic basis of yttria. See YTTRIA *supra*.

YTTRIO-TANTALITE, in *Mineralogy*, *Tantale yttrifere*, Brongniart, an ore of tantalum, combined with the newly-discovered earth called yttria, and found at Ytterby, near Roslagen, in Sweden. The colour of yttrio-tantalite is a dark iron-black; when pulverized it is greyish: it occurs in nodules, about the size of a hazel-nut, and also crystallized in oblique six-sided and four-sided prisms. It occurs also in granular distinct concretions. Its fracture is compact or finely granular, and it has a shining metallic lustre. Yttrio-tantalite scratches glass, but yields with difficulty to the knife. The specific gravity of this mineral is 5.13. It decrepitates with the blow-pipe, but at length melts into a greenish-yellow slag. According to Vauquelin, the constituent parts are,

Oxyd of tantalum	-	-	45
Oxyd of iron and yttria	-	-	55
			100

Yttrio-tantalite is nearly allied to gadolinite, the other mineral in which yttria is found, and occurs with it at Ytterby, in a bed of flesh-red felspar in gneiss.

YTZAIMPATLI, in the *Materia Medica*, a name given by some to the cevadilla, or *bordeum causticum*, the *caustic Indian barley*.

YU, in *Geography*, a city of China, of the second rank, Vol. XXXIX.

in Pe-tche-li; 87 miles W. of Peking. N. lat. 39° 52'. E. long. 114° 14'.—Also, a city of China, of the second rank, in Ho-nan; 442 miles S.S.W. of Peking. N. lat. 33° 22'. E. long. 112° 38'.—Also, a city of China, of the second rank, in Ho-nan; 377 miles S.S.W. of Peking. N. lat. 34° 16'. E. long. 113° 14'.—Also, a river of China, which rises in Ho-nan, 12 miles N. of Pi-yang, and joins the Hoai, 20 miles E.S.E. of Sin-fai.—Also, a river of China, which rises about 26 miles W. from Ngan-fou, in Kiang-fi, and runs into the Kan-kiang, 7 miles N.N.E. of Lin-kiang.

YUCATAN, a province of Mexico: it is a peninsula, surrounded on the W. and N. by the gulf of Mexico, between the bay of Campechy on the S.W., and that of Honduras on the S.E., having the little province of Tabasco on the S.W., and that of Vera Paz, in the audience of Guatemala on the S., where it is joined on the continent by an isthmus not 120 miles broad. The climate is pretty warm in summer, which begins about April, and ends in September. It rarely rains here during the winter season, though the weather is tolerably cool, except in January and February, which are almost as hot as in the middle of summer. It is, however, very healthy, especially a large mountainous tract, extending from Salamanca on the W., to the eastern boundary, and where the natives live to a great age. The south side of this ridge is ill-peopled, and worse cultivated, for want of water; but the north part is very populous, being rendered pleasant by gentle breezes, though the sun is very hot. The days and nights are nearly equal all the year. The soil when properly cultivated produces great quantities of corn, cotton, and indigo. All sorts of cattle, wild-beasts, honey, wax, and fowls, are here in great plenty; and on the coasts are found large pieces of amber; but as no mines were ever discovered in this country, the Spaniards are not fond of making settlements here, so that it abounds mostly with Indians, subject to the Spaniards, who employ them in making salt, in the bay of Campechy. This peninsula has very few rivers, but wells without number, and considerable lakes; and wherever they dig up the land, abundance of shells are found, which with the lowness of the country, and shallowness of the sea about it, has induced many to think that the greatest part of it was once under water. The capital of Yucatan is Campechy, in the bay of which, and of Honduras, the former lying on the west, and the latter on the east side of this province, the English cut their logwood.

YUCCA, in *Botany*, is the *Yucca*, *Tuca*, or *Jucca*, of the original inhabitants of America. Gerard appears first to have published this name in England.—Caspar Bauhin follows him. Linnaeus, *Phil. Bot.* 164, lays to the charge of Tournefort the introduction of *Yucca*, as a scientific generic appellation, but we do not find it in his work. Dillenius however adopts it in his *Nova Genera*, and *Hortus Etlhamensis*, and Linnaeus rather overlooks that approves of the barbarism.—Linn. Gen. 170. Schreb. 226. Willd. Sp. Pl. v. 2. 183. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 2. 291. Pursh 227. Juss. 49. Poir. in Lamarec Dict. v. 8. 824. Lamarec Illustr. t. 243. Gærtn. t. 85. (Yucca; Dill. Norv. Gen. 111. t. 5. Ponted. Anthol. 294. t. 6. f. N. O. Cordylina; Van Royen Lugd.-Bat. 22.)—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Coronariæ*, Linn. *Lilia*, or perhaps *Bromelzæ*, Juss.

Gen. Ch. Cal. none. Cor. bell-shaped, in six deep, ovate, very large, equal, moderately spreading segments, connected by their claws. Nectaries none. Stam. Filaments six, inserted into the base of the corolla, very short, swelling upwards, reflexed; anthers minute, roundish. Pist.

YUCCA.

Germen superior, oblong, bluntly triangular, with six furrows, rather longer than the stamens; style none; stigma obtuse, with three furrows, its lobes cleft, the centre pervious. *Peric.* Berry oblong, bluntly hexagonal, fleshy, perforated at the summit, of six cells; three of the partitions thicker than the three intermediate ones. *Seeds* very numerous, in a single row, separated from each other by transverse membranes, roundish-obovate, flat, depressed, attached, by their pointed base, to the inner angle of the cell.

Effl. Ch. Corolla inferior, bell-shaped, its segments without nectaries. Stamens club-shaped. Style none. Berry hexagonal, of six cells. Seeds numerous, flat.

Obs. We have, like Schreber, adopted Gærtner's idea of the fruit, which Linnæus does not appear to have seen in perfection, and which Dillenius confesses himself to have judged of from the unenlarged germen only. Analogy might well lead these authors to presume it a capsule, which, from the structure of the germen, might be judged to consist of three cells. This idea was moreover supported by an account which Ray had somehow obtained from the East Indies; where indeed no *Yucca* grows wild, and therefore this account cannot implicitly be trusted. Gærtner received, from professor Hermann of Strasburg, the ripe fruit of *Yucca draconis*; and this being the only authentic inflange of the seed-vessel of any one of the genus passing under the investigation of a critical botanist, we must rely on it as affording the only certain type of the genus in this particular. Jussieu appears to have followed Linnæus; but the discovery of the true nature of the fruit, rather favours his opinion above-mentioned, of the affinity of *Yucca* to his *Bromelia*. This is a handsome perennial genus, more or less caulescent, with numerous, long, simple, rigid or coriaceous, pungent leaves; and copious, paniced, white, liliaceous, very elegant though generally inodorous flowers. Some of the species are tolerably hardy in our gardens, but they do not very readily or contently blossom.

1. *Y. gloriosa.* Common Adam's-needle. Linn. Sp. Pl. 456. Willd. n. 1. Ait. n. 1. Pursh n. 4. Curt. Mag. t. 1260. Andr. Repof. t. 473. (*Y. five* Jucca, peruana; Ger. Em. 1543. *Yuca indica*, foliis aloes, flore albo; Barrel. Ic. t. 1194.)—Caulescent. Leaves lanceolate, straight, furrowed; their edges smooth and entire.—Native of Peru and North America. On the sea shore of Carolina, flowering in July and August; the whole plant about ten feet high. *Flowers* white. *Pursh.* The stem in our gardens is seldom two feet in height, somewhat branched, thick, tough, crowned at the summit of each branch, if divided, with a profusion of crowded leaves, spreading in every direction, each a foot and a half or two feet long, tapering to a hard spinous point; contracted in the lower part, but dilated at the very base, where they half clasp the stem; their upper surface is of a fine green, smooth, furrowed longitudinally, especially towards the end; the under paler, and more even; the edges quite even and smooth. *Panicles* terminal, compound, erect, composed of perhaps an hundred drooping flowers, not much inferior in size and beauty to those of the White Water-Lily, but more cream-coloured, tinged at the base and points with crimson, destitute of scent. *Partial stalks* about an inch long, round, smooth, with a pair of membranous bractæ at the base. *Stigma* in three distinct, spreading, cleft, lobes. We cannot but think, notwithstanding Mr. Ker's opinion, that Andrews's figure belongs to this species, and not to *alcifolia*. This is evinced by the furrows and margin of the leaves, as well as by the structure of the stigma; though we must allow the whole

representation to be less happy and characteristic than that in the Magazine.

2. *Y. recurvifolia.* Drooping-leaved Adam's-needle. Salisb. Parad. t. 311. Pursh n. 3.—Caulescent. Leaves linear-lanceolate, furrowed, recurved and drooping; their edges at length somewhat filamentous.—Native of the fandy shores of Georgia, where it was found by M. Leconte, flowering in July and August. The flowers are of a greenish-yellow, with a tinge of purple. *Stem* about three feet high. *Pursh.* This species is recorded in the *Paradisus Londinensis*, as having flowered, in the late Mr. Swainson's garden at Twickenham, in 1805; yet it is not admitted by Mr. Dryander, or Mr. Aiton, into the *Hortus Kewensis*, or its *Epitome*. The flowers are said by Mr. Salisbury to have a strong smell, mixed with something like a citron flavour. The three inner segments of the corolla are a little the broadest. *Stigma* most like the last. The edges of the leaves split off in a few disjointed filaments, in the manner of *Y. filamentosa*, though far less remarkably. We have seen no specimen. Mr. Pursh having observed this, as well as the *gloriosa*, in a living state, in North America, chiefly induces us to admit it into our list of species; garden plants being always less to be trusted in any doubtful question.

3. *Y. alcifolia.* Aloe-leaved Adam's-needle. Linn. Sp. Pl. 457. Willd. n. 2. Ait. n. 2. Pursh n. 5. Curt. Mag. t. 1700. (*Y. arborefcens*, foliis rigidioribus rectis ferratis; Dill. Elth. 435. t. 323.)—Caulescent. Leaves linear-lanceolate, even, straight; their edges bordered with fine callous notches.—Native of South America, according to most authors; of the coast of Carolina and Florida, flowering in August. *Pursh.* It was introduced, more than a hundred years ago, into the English and Dutch gardens, and is generally treated as a green-house shrub, though said to succeed and flower better, in mild seasons, in the open ground. The stem is generally simple, and rises to the height of fifteen to eighteen feet, even in our conservatories, being for the most part naked, round, three or four inches in diameter, marked with scars where leaves have been. The upper part, for the space of a foot or more, is thickly beset with leaves, spreading in every direction, the lower ones pointing downwards, the upper ones nearly upwards, a few in the middle only being horizontal. The leaves are all straight, narrower and stiffer than in *Y. gloriosa*, and distinguished by their crenate edges, as well as even surface. The panicle also is more dense and cylindrical, from two to three feet high. *Flowers* white, externally tinged with purple. *Stigma* abrupt, of three shorter, less dilated and spreading, lobes.—Mr. Ker truly remarks, in the Botanical Magazine, that this species will thrive for many years with very little earth, in pots not more than a foot deep. Its flowering is a rare occurrence, and after that event, the head decays at the top, throwing out lateral shoots, and the plant becomes branched; but its elegant simplicity is destroyed, and we believe no more flowers, at least in our gardens, are ever produced.

4. *Y. draconis.* Drooping-leaved Adam's-needle. Linn. Sp. Pl. 457. Willd. n. 3. Ait. n. 3. (*Y. draconis folio*, ferrato reflexo; Dill. Elth. 437. t. 324. Tacori; Cluf. Exot. 48.)—Caulescent. Leaves linear-lanceolate, even, reflexed, crenate. Segments of the corolla spreading, somewhat recurved.—Native of South Carolina, according to Mr. Aiton, who marks this species as a hardy shrub, flowering in October and November. We have never seen an authentic specimen of the flowers, but in the very admirable plate, communicated to Dillenius by his friend Sprekelson of Hamburg, and published in the Hort. Elth. as above, the corolla is represented with more lanceolate, flat, spread-

ing, and in some measure reflexed, segments, than in any of the foregoing. The *leaves* are described longer, narrower, and thinner than in the last species, reflexed, being bent downwards, and pendulous, from about the middle, or rather nearer the base; they are moreover shining, of a deeper green, less concave, and with longer more slender terminal spines. They are an inch broad, and above two feet long. Dillenius says the marginal notches are rather finer than in the last. The Linnæan specific definition implies the reverse. Commelin's plate in his *Praeludia Botanica*, t. 16, exhibits very large and distant spinous teeth, at the edges of the *leaves*, such as we have never seen, even in young plants. We have therefore refrained from citing this author under the present species, as well as his t. 14. of the same work, and Plukenet's t. 256. f. 4. under the last; because, though they may be right, such figures afford no information or instruction. Clusius says the Indians use the fibres of the leaves of the species of which we are treating, obtained by maceration and beating, as a fine kind of thread, like flax or silk; and they also make strong cordage of the same, for tying the rafters of their huts together. Such qualities merit further inquiry.

5. *Y. filamentosa*. Thready Adam's-needle. Linn. Sp. Pl. 457. Willd. n. 4. Ait. n. 4. Pursh n. 1. Curt. Mag. t. 900. (*Y. foliis lanceolatis, acuminatis, integerrimis, margine filamentosis*; Trew's *Ehret* 9. t. 37. *Yucca*, five *Jucca*, vera, foliis filamentosis; Moris. sect. 4. t. 23. f. 2.)—Stem none. Leaves lanceolate, entire, coarsely filamentous at the edges.—On the shores of Virginia and Carolina, and in the western parts of the same countries, flowering in July and August. *Pursh*. A hardy perennial in our gardens, flowering, though not very constantly, in autumn. The *leaves* are numerous, a foot long, spreading in the form of a rose from the crown of the root; their points spinous, but short; their surfaces both striated, a little glaucous, rough to the touch with minute harsh prickles; their edges beset with long recurved threads. *Flower-stalk* solitary, erect, from four to five feet high, round, smooth, leafless, bearing several scattered, oblong, membranous, reddish-brown *bractees*, such as also accompany the partial stalks. *Panicle* compound, lax and spreading, of numerous large and handsome, pendulous, cream-coloured, bell-shaped *flowers*, represented of much too yellow a hue in the Botanical Magazine. Their segments are taper-pointed. *Filaments* rough, or glandular, with very small *anthers*. *Stigma* with spreading, somewhat recurved and cloven, lobes, like *Y. gloriosa*.

6. *Y. angustifolia*. Narrow-leaved Dwarf Adam's-needle. Pursh n. 2.—Stem none. Leaves linear, elongated, rigid, sparingly filamentous at the edges. Fruit obovato-cylindrical.—Gathered by Mr. Nuttall, on the banks of the Mississippi, flowering in July and August. Perennial. *Leaves* very narrow. *Stalk* from two to three feet high. *Fruit* large. *Pursh*. This appears not yet to have been brought to England.

The name of *Yucca* may be found applied, by the older botanists, to several plants which have no botanical affinity to the present genus; such as Morison's sect. 4. t. 23. f. 3, where the *leaves* are digitate; and *Jatropha Manibot* of Linnaeus. (See *JATROPHA*.) Such plants agree in the essential quality of their fleshy *roots*, which when grated and washed, yield a farinaceous substance, of which the natives of America and the West Indies appear to have made a kind of bread, long before our European corn was introduced among them.

Yucca, in *Gardening*, contains plants of the succulent, evergreen; shrubby, hardy, and tender kinds, in which the

species cultivated are, the common Adam's-needle (*Y. gloriosa*), the thready Virginian yucca (*Y. filamentosa*), the aloe-leaved yucca (*Y. aloifolia*), and the dragon-tree-leaved yucca (*Y. dracaonis*).

These are all succulent evergreen shrubby plants, some of them having a fleshy nature and great regularity of growth.

Method of Culture.—These plants are all capable of being raised by offsets or suckers, from the roots and heads of the old plants, as well as by seed.

The offsets and suckers may be taken off any time in the spring or summer seasons, being laid in some dry place for a few days, till the wounded part cauled by the separation from the plant is dried and healed over; when they may be planted out separately in pots of light sandy compost, and be placed in a shady situation till they have taken root in a perfect manner. When affixed by a hot-bed, they often succeed better.

The feed obtained from abroad should be sown in the spring in pots of light earth, plunging them in a hot-bed, in which the plants soon come up; and when they are two or three inches high, they should be pricked out separately in small pots of light sandy mould, replunging them in the hot-bed to forward their growth, assisting them with moderate waterings and fresh air daily, and hardening them by degrees to the full air, so as to be set out in June to remain till October, when they should be removed into the greenhouse for the winter.

Some plants of all the sorts should constantly be preserved in pots.

They are all very ornamental; the two first after they have been hardened, in the dry borders, where the soil is light, and where the situation is warm and sheltered; and the others in green-house collections, among other potted plants.

YUE, in *Geography*, a city of China, of the second rank, in Yun-nan; 1105 miles S.S.W. of Peking. N. lat. 25° 22'. E. long. 103° 22'.

YUEN, a river of China, which runs into the lake Tongting, 17 miles E. of Tchang-te.—Also, a city of China, of the second rank, in Hou-quang; 850 miles S.S.W. of Peking. N. lat. 27° 23'. E. long. 109°.

YUEN-KIANG, a city of China, of the first rank, in Yun-nan, on the Ho-ti river; 1250 miles S.W. of Peking. N. lat. 23° 37'. E. long. 101° 44'.

YUEN-TCHEOU, a city of China, of the first rank, in Kiang-si; 750 miles S. of Peking. N. lat. 27° 50'. E. long. 114°.

YUEN-YANG, a city of China, of the first rank, in Hou-quang, on the river Han; 517 miles S.S.W. of Peking. N. lat. 32° 50'. E. long. 110° 29'.

YVERDUN, or *IFERTEN*, a town of Switzerland, in the Vaudois, and capital of a bailiwick, in the canton of Berne, situated on the lake of Neuchâtel, otherwise called the lake of Yverdun, at the mouth of the river Orb, which divides into two branches, forming a good port, and an island, on which the town is situated. The two faubourgs communicate with the town by bridges. It is ancient, and in the Theodosian table called "Castrum Ebredunense," and "Ebrudunense," by which it is understood to have been a place of strength. The Romans maintained here a *praefectus barbariorum*, and there yet exists a society of boatmen, of ancient standing, and numerous, who have a particular police, privileges, and laws of navigation. From the Romans it duked to the kings of Burgundy, and afterwards to the dukes of Zahringen. In the year 1259, it was taken by Peter of Savoy, who reduced it by famine, and it continued

in that family till the year 1536. In this year, the troops of Berne, when they had reduced the rest of the Vaudois, laid siege to this town, and after a few days, became masters, since which Yverdun has been subject to Berne. The police is administered by a great and little council, composed of thirty-six members, the president of whom has the title of *banneret*. It has a large and strong castle, flanked with four towers, built in the 12th century, by Conrad, duke of Zähringen: other public buildings are, a college for the instruction of youth, an hospital, divers magazines, &c. and in the town-house is a library, formed not long since by contribution. The environs were formerly a morass, which has been drained, and is now become good and fertile land. Near the town is a sulphureous medicinal spring, and in the year 1730, a building, for the purpose of bathing, was erected by the magistrates. In the middle of the last century, a company was formed, for the purpose of making a navigable canal from the lake of Yverdun to the lake of Geneva, but it was never finished. The bailiwick is one of the most considerable in the canton of Berne, containing about 25 parishes and 20 lordships, and is about 15 miles in length. The fertility is moderate: the wine is not of the best quality; 34 miles S.W. of Berne. N. lat. 46° 48'. E. long. 6° 14'.

YVES, or IVO, in *Biography*, bishop of Chartres, was born in the 11th century, of a noble family, in the territory of Beauvais, and studied theology under Lanfranc, prior of Bec. Being made abbot of St. Quentin, he opened a theological school, which became famous; and having superintended this institution for fourteen or fifteen years, and maintained a regularity among those who attended it conformable to the ancient canons, he was justly regarded as one of the chief founders of the order of canons-regular. Upon the death of Geoffrey, bishop of Chartres, he was chosen as his successor, and the election was confirmed by Urban II. in 1091. The discipline he maintained in his see was exemplary, and in the duties of it he was employed for 25 years, his episcopate and his life terminating in 1116. Besides sermons, a brief chronicle of the kings of France, and two collections of ecclesiastical decrees, he has left 287 epistles, from which may be learned the manners of the times in which he lived. Of these we have a summary by Dupin. A collection of his works was printed at Paris in 1647. His name is highly respected in the church of Rome; and pope Pius V. issued a bull in 1570, empowering the canons-regular of Latran to celebrate an anniversary for "the blessed Yves." Dupin. Moreri.

YVETOT, in *Geography*, a town of France, in the department of the Lower Seine. This was once a place of consequence, and the capital of a kingdom; 18 miles N.W. of Rouen.

YUFTS, or *Russia Leather*, as it is called in England, are the chief products of the tanneries in Russia; and the principal places in which they are prepared, next to Moscow and Petersburg, are, Arlarnas, Kostroma, Yaroff, Pfcove, Kazan, Vologda, Nishney-Novgorod, Vladimir, Ekatarinenburg, &c. Mr. Tooke has described the process by which they are prepared:—The raw ox-hides are first laid in running water, or in large tanks full of water dug in the earth for that purpose, to soak for a whole week; but in summer not so long. During this time they are daily taken out of the water, and scraped at a scraping-bench, or wooden horse. Having now been duly steeped, they are put into a ley, thus prepared: In other vats, likewise dug in the ground, and under cover, they mix two parts of good ashes with one part of unslacked lime, in boiling water, and sink the wet hides in this ley on

a grating, which being suspended by cords, can be raised or let down at pleasure. In this vat the hides are laid again for about a week, though in warm weather less, in cold perhaps even longer. The sign that they have lain long enough in the ley is, that the hair can without difficulty be rubbed off with the hand, so that none remains. If the hides, after the expiration of a week, are not in that condition, fresh ashes are put into the ley, and the skin sunk in it. But if at length the hair be sufficiently loose, the hides are entirely taken out of the ley, and all the hair scraped off on a stretching-block, by means of blunt iron scrapers with two handles. The hair is washed clean, and sold for domestic uses. The hides, thoroughly cleaned from hair, are suspended in vats of clean water on a running stream, where they remain three days, diligently turning them to and fro, in order to purge them from the ashes and ley; afterwards they are hung up, and left to drain. The hides must now be scraped on the flesh side. To this end they employ either the aforesaid scraping-iron, or others sharper in various degrees. After this treatment, the hides are trampled. But calves-hides have another sort of preparation, which the yuft-tanners, in the interior towns of the empire, who mostly practise it, call *rakcha*. This preparation is performed with the white excrement of dogs dried, which is dissolved in boiling water, and to a hundred hides about four vedros full of excrement is the rule. If here the right proportion with the water be not found, the hides corrupt in this slime, the object whereof seems to be the complete freeing of the skin from the salts that adhere to it from the ley. The hides are left to lie twice twenty-four hours. With this is stirred a four gruel of oatmeal with warm water, and to three omiss, or eights of a chetverik, three or four vedros of dregs of the common quas, which the people make of meal and a small portion of malt, put in the thin gruel, that it may quickly four with the hides. To ten hides, the tanners usually reckon forty pounds of meal.

After the hides have soured, which is done in large vats, they are laid in other vats, and well steeped for two or three days in a strong tan-juice, sok, thoroughly boiled from good bark. When this is done they are brought straight to the tan. In the tan-pits, in which often some hundreds of hides are lying, is poured half-water and half tan, or water boiled with tan, and a grating is hung in with cords, having one hide after the other spread upon it, thick strewed with good fine-pounded tan, and the grating constantly let deeper into the pit, till it be nearly full; yet so that the tan-liquor is always above the hides, which are then again sprinkled over with tan. In this tan the hides continue to lie a week; those of full-grown animals longer. On being taken out, they are washed and trampled on, which two workmen in a summer's day can perform with three hundred hides. The next day they are laid, in the manner above-described, in fresh tan. Thus they generally get four times successively fresh tan, and are every time rinsed clean. In the last tan they lie three weeks, or longer, are then finally washed, hung up, and, when they have tolerably drained, delivered to those workmen whose business it is, in particular workshops, to dye, dress, and wax the yufts, and to deliver the goods finished. It is to be observed, that the Russian yuft-tanners seldom use oak-tan, and never willingly. The choicest and best tan is that of the sferchnotal, as they call it, or the black willow; and also the young bark peeled off from other shrubby willows, which are collected by the boors, dried in bundles, and brought in cart-loads to market. To ten hides, the tanners compute one and a half fathom of these bundles of willow-bark,

YUFTS.

bark, as they are laid one upon another for sale, through all the tans. It must not, however, be imagined that the excellence of the Russian yufts depends on this; for in Siberia, where are no oaks, and but few willows of any size, they tan yufts with only birch-bark, which are not much worse than the Russian. The bark is made small by either ordinary tan-mills, turned by horses or by water; or the tanner himself, in many towns where there are no mills, causes it, at unnecessary expence and labour, to be pounded in wooden mortars, or excavated blocks, with pebbles, almost like those in the tan-mills, by day-labourers.

The dyeing of the yufts is performed in two ways, and of two colours. The commonest and most natural custom of giving the colour to the hides is, by sewing them together in pairs, the hair side inwards, while they are yet moist, round the edges, with rushes or stripes of bark, thus forming them into a bag or sack; into this sack the colour is put, the sack well shook, and the superfluous dye let to run out, whereupon the skins are dried. From this method of dyeing them, it seems to proceed that the yufts are called and taken by pairs. The other process, whereby much trouble, time, and colour are saved, and the edges of the skin entirely preserved, is the following: Each skin is hung upon a horse over a long trough, so that the hair side, which must be stained, appears outwards, pouring the dye upon it out of the dye-kettle, till the whole skin is dyed. The two colours given to the yufts are red and black. The red dye is thus prepared: Pound brasil-wood (sandal) in the pounding-mill, or with hand-pebbles, as fine as the tan, and boil it in kettles. Previous to the dyeing, steep the skins in alum-water. It is calculated, that to each small yuft-skin a half, and to a large one a whole pound of logwood is put. But the latter are mostly coloured black. To a hundred yufts to be dyed red, four pounds of alum is sufficient. For dyeing black the brasil-wood is likewise used; but in the red dye, to a hundred skins three pounds of good iron vitriol is dissolved. After the first tincture the skins are dried, and afterwards on tables done over again with the same dye and rolled up, that they may thoroughly imbibe the dye. For heightening the colour this tincture is sometimes thrice repeated. When the skins are now tolerably dried, by hanging, that the colour may not fade, with the flesh side outwards, the yufts, still somewhat moist, are smeared over on tables that have ledges. There was a time when it was commanded by authority to use nothing but dolphin and seal-blubber for smearing them; but by that the yufts are harsher, and have not that yuft smell, which foreigners prize so much, unless the birch-tar, deggot, prepared in Russia, at least be mixed with it. At present this birch-tar alone is used for smearing. This done, the skins are cleaned from any impurities that may remain, and are sent to the dressing-house, where skilful workmen scrape them first with scraping-irons, having two handles, with the edge cross-wise on a stretching-bench, that a soft thin leather remains with a clear glossy surface, free from all impurities. Other workmen then take the clean-scraped yufts on large clean tables, sprinkle them on the flesh side with a gentle shower of fresh water from their mouths, and lay them slightly rolled up to moisten. This done, the skins are taken separately one after another, folded together, and worked and calendered in all directions, to make them soft and pliant. They are then carried with a kind of wooden curry-comb, with sharp irons fixed in leathers, like a card for carding wool, the skin being folded with the hair side outwards, by which the whole surface of the yufts acquire the cross-strokes or trellis-like marks they are always seen to

have. Some work the skins with the hands first dry, not sprinkling them till they are mangled with the card. Lastly, those skins which are too harsh and stiff to the feeling, are more or less sprinkled with linseed-oil, and thus are ready for the merchant.

In this connection we shall introduce from the same author an account of the Russian method of preparing and dyeing their fallian, maroquin, or Morocco leather, which are dyed at Atrachan of three colours, red, yellow, and black. The treatment of the red fallians, which are the most famous, is usually as follows:—The raw hides are first laid in large vats, and have river water poured upon them, in which they are left to soak for three or four times twenty-four hours. They are then taken out, the water is drained and squeezed from each skin, and are scraped one by one on the stretching-bank with scraping-irons, uraki, quite gently on the flesh side, in order to take away the grosser impurities, but principally for opening the skin, and to qualify it for the ensuing operation.

They now proceed to make the hair fall clean off, chiefly by the application of lime. To a hundred hides is stirred in about half a bushel of unslaked lime in vats with river water, and the hides are laid in so as that the lime may as much as possible be equally distributed over all of them. The Atrachan Tartars let the hides lie in this lime-pit frequently three weeks; but it is well known, that their fallians are so harsh and liable to crack, and even scorched by it, that they are fit for nothing, and can only impose upon an inexperienced purchaser. They then take out skins, wash them, and carefully scrape off the hair, now become loose, with wooden scrapers. It often happens, that the hair is not perfectly loosened by the first lime-ley, but that many tender stubbles and small hairs are left remaining. In this case, the hides must be put into fresh lime-ley, and be left perhaps two weeks in it; the hair then comes off, and the hair side of the skin gets a green and very white appearance, but the substance is then also very soft, and the fallians, by this corrosion of the lime, are very little durable in comparison of other kinds of leather.

The method now for taking the lime again out of the hides, is the second treatment with dog-excrement, or white gentian, which is carefully collected for this purpose. This excrement, which is indispensably necessary, is pounded, put into a narrow not very large vat, warm water poured upon it, the mass thoroughly stirred, and the cleaned hides are put with it into another vat, so as that the dissolved album grecum is spread and insinuated over and between every skin. In these ingredients, the skins must lie only twenty-four hours, or if the quantity of album grecum prove not rich, somewhat longer. The proportion here to be observed cannot be accurately ascertained; for the fallian-makers are guided generally by eye-measure, and observe only that the water be very thick and turbid, and consequently acid enough. The hides come out of this corrosive much softer and thinner than they were, and are now freed from the force of the lime; but no time must be lost in endeavouring to extract the corrosive likewise, that the hide may not be even more ruined by it than by the lime. They are generally very careful that the hides lie not too long in this corrosive, which they judge of by their eye from the pliancy and suppleness of them. As soon as the skins are lifted out, the unclean moisture is carefully and forcibly pressed out, and they are laid without loss of time in a vat, wherein wheat-bran is stirred to a tolerably thick gruel with warm water; in this they lie again about thrice twenty-four hours, whereby all the former defects are completely remedied, and the substance of the

skin

skin is softer and mellow. All these particulars are in some measure of no other service than to bring off the hair thoroughly clean from the skin.

Now follows the proper preparation of the skins taken out of the wheat-bran. This is done chiefly by honey. To eighty hides they take about twenty-five pounds of raw honey, boil it in a kettle, pour as much water to it as is necessary for giving it a due consistence, and stir it for a pretty long time boiling on the fire. They then let the kettle cool, till they can but just bear the hand in it, and then pour the still hot honey-water on the hides lying singly in little trays, by ladle-fuls, till they have thoroughly imbibed the honey-water. When all the skins are duly drenched, they are thrown into a dry vat all together, laying at top a board with weights upon it, and covering the whole vat with felt, carpets, or furs, that the vapour during the fermentation may not escape; and in this manner, the skins must ferment once more thrice twenty-four hours. By this means they acquire the grain. From the honey-vat they are rinsed clean in luke-warm water, wrung as dry as possible, and steeped immediately in a moderately strong pickle or brine made of common salt, in which they must be left five or six days. This time being elapsed, the skins are taken out of the pickle, and hung upon clean poles, that the brine may drain out, as it would be thought injurious to squeeze it out with the hands. This done, the skins have received their whole preparation, and may now be dyed red, but not yellow; because for the yellow saffians, as was said before, the preparation is of another kind.

For giving the red saffians the colour, nothing is used but cochineal, or, as the Tartars call it, kirmis, and that in the following method: First, they boil a quantity of the herb *salvia ericoides*, by the Tartars called tshagan, plentifully growing on the arid Aitrachan salt-steppes. To about four Russian vedros of water is put of this dried herb somewhat less than a pound, and it is set to boil for a whole hour, whereby the water acquires a dark greenish colour, but betrays no acrimony to the taste. The saffian-maker only takes care that the water be not too deeply tintured, and that when dropped on the thumb-nail shews only a scarce perceptible green; and in case it have adopted too many particles of the colour, it is drawn off, and fresh water put, in which the herb must boil again, till the decoction has received the due degree of saturation. The herb is then with a scoop taken clean out of the kettle, and then the previously nicely powdered cochineal thrown into a kettle of four Russian vedros to about half a pound, well stirred, and fresh fire added, in which great attention must be paid, that the red scum, which arises from boiling, does not boil over, therefore constantly some is taken and again poured in, in order by this refrigeration to prevent the over-boiling, and to allay the foam. After boiling for about an hour and a half, the water has obtained a strong tincture; but as much of it is boiled away, the kettle is filled up again with the remaining decoction of the herb tshagan, and the thus attenuated colour boiled afresh, till it is seen that the cochineal is perfectly dissolved, and the colour become thoroughly bright. Upon this, to the whole kettle is put about two lots of pounded and burnt alum into the dye, with which it is to boil about a quarter of an hour, and then the fire is taken from under the kettle, leaving only some hot embers, that the dye may retain as much heat as the hand can but just bear. This done, the skins prepared for dyeing are taken in hand, the dye poured by ladles into trays, one skin folded together after another, with the hair side outwards, and then are worked in their portion of dye so long, till they have uni-

formly absorbed all the dyeing particles, and only somewhat of a pale moisture remains. The leathers being thus for the first time stained are quickly squeezed out, hung up singly across poles, and when they are all done, they are directly taken for the second time, and imbued in the same manner with dye, and this treatment is repeated for the third and the fourth time; so that each skin gets four ladles of the dye. From the fourth dye the skins are no more pressed out, but hung up entirely wet, to be ventilated, upon poles.

After the dye, the skins are once more curried with the leaves of the tan-tree, which the Armenians call belgê. The crushed or pounded dry leaves, which the Aitrachan saffian-makers get from the Terek, are stirred in broad troughs to a thick gruel with river water, and the coloured skins laid in it, between each of them, leaving a sufficiency of the leaf-ooze; the tanner then goes barefoot on the troughs upon the skins lying on one another. In this tan, or quas, as the workmen call it, the saffians lie eight days and nights, adding fresh tan every other day; so that four tans are necessary.

Here it must be observed, that some Armenians who prepare saffians, for enhancing the quality of the red colour of their saffians, to half a pound of cochineal add two lots, or rather more of sorrel, (or lutor, or loter, as they call it,) in the dye-kettle, but it is usually omitted in Aitrachan, on account of its high price; for which reason the Aitrachan saffians are excelled by the Turkish in beauty of colour. Secondly, it is to be known, that instead of the leaves of the tan-tree, bruised nut-galls are held to be still more serviceable for giving the saffians the tan. By this means, the colour is so durable as never to pass away but with the leather; whereas the saffians prepared with the tan-tree begin soon to be discoloured. But the nut-galls are likewise too dear in Aitrachan to be customarily used by the saffian-makers. The Kazan Tartars colour their saffians with red wood, and tan them with the shrub *uva ursi*, but it makes the worst saffians of all, as they presently fade.

When the saffians are lifted out of the tan, still the last work remains. They are first left some time in the air to dry, they are afterwards scraped on the stretch-bank with sharp scrapers on the flesh side, quite smooth and clean, then washed in running water, each skin duly stretched with pegs all round the edges, and thus left till they are dry.

The skins must now be smoothed on the hair side with a wooden instrument for that purpose; and lastly, they are laid on a thick felt, where, with an iron heckle that has blunt points, those little pittings, which the saffians are generally seen to have, are impressed on the same side. And thus they are ready for sale, without being smeared with linseed-oil, as is mentioned in Gmelin's travels, which would infallibly spoil them.

The yellow saffians are little made in Aitrachan, as the demand for them is much less, and there are but few saffian-makers who know much of the matter. The dye which they make use of for this purpose is of the berries of a sort of rhamnus (perhaps *lycoides*), which are brought from Persia under the name of ulocharr, and usually bought for six to nine rubles the pood. The Kazan Tartars colour their ordinary yellow saffians with the flowers of the yellow camomile, which they gather under the name *sare tshetchiaki*, i. e. yellow-flower.

In preparing the yellow saffians, they observe in Aitrachan the following difference of treatment: 1. They make no use whatever of honey in the preparation. 2. They never

never at all put the hides into the salt brine. 3. Instead of the honey-preparation and the pickling, they lay the hides before the dyeing, in the foregoing manner, in the tan of the leaves of the kitzlar tan-tree, leaving them in it eight days. 4. For preparing the dye, they have no need of the herb tſchagan, but the berries alone are boiled in clear water, of which to four Russian vedros of water about ten pounds are requisite, and heighten the colour afterwards with three lots of alum to every pound of berries. The dyeing is performed in the same manner as has been related with the red, and after the dyeing there is no need to lay the saffians in the tan, as having before received it. Nothing more is necessary than to scrape them clean, to work them thoroughly, to polish and to ornament them. The yellow saffians usually are sold at one ruble twenty kopecks; but the red at somewhat more, on account of the dearth of the dye, generally one ruble eighty kopecks.

YUG, or YOG, the more correct mode of writing the word *jogue*, by which the Hindoos distinguish the poetical or mythological ages of the world. We have noticed these wild speculations under the more popular word *jogues*; and to which, to GENTOOS, KALKI, KALPA, and YOGESWARA, we refer those desirous of farther information hereon.

YUGASIRI, in *Hindoo Mythology*, is the name of the wife of *Vairava*, an incarnation of *Siva*. See those articles.

YUHAGHIRS, in *Geography*, a Russian tribe, which occupies the northernmost parts of the territory of the Yakutes, bordering on the Frozen ocean, from the Yama to the Koly-ma. They were known to the Russian conquerors as early as the Yakutes; but on account of their wild and impassable deserts, could not be brought into entire subjection until the year 1639. They had never seen a horse, though that species of animals was found among the Yakutes; and therefore they appear to have been for a long time confined to their cold, fenny, and mountainous districts. The whole people, at the revision before the last, says Mr. Tooke, paid taxes only for about 1000 heads; but it was so easy for them in their deserts to evade the payment, that their entire population may be computed at a much higher number. See YAKUTSK.

YVIA, a town of France, in the department of the North coasts; 4 miles E.N.E. of Pontreue.

YVICA. See IVICA.

YUKANLOOT, a town of Candahar; 10 miles E.N.E. of Saffa.

YULDUZ. See YOLOROU.

YUMA, or YUMBA, or *Long Island*, one of the Bahama islands: about 50 miles in length, of very unequal breadth. N. lat. 23° 20'. W. long. 74° 50'.

YUMA, in *Mythology*. See TSCHEREMISSES.

YUMAR, the name of the object of worship among the Votiaks; similar probably to Yuma, Yummel, and Yummala, among other tribes of the ancient Finns.

YUMBA BAY, in *Geography*, a bay on the E. coast of the island of Hispaniola, S. of Cape Spada.

YUMETOS, a cluster of small islands, among the Bahama islands, about 20 miles S.W. from Yuma.

YUMFONG, a small island, near the coast of China, about three miles from the island of Tſeng-ming. N. lat. 31° 42'. E. long. 121° 17'.

YUMMALA, in *Mythology*, an idol deity of the Finns, who had a rich temple in Permia, or Biermia, supposed to have extended from the White sea to the mountains of Ural. This temple was decorated with a profusion of gold and jewels. See PERMIANS.

YUMMEL, an appellation by which the Lieflanders and

Esthonians worshipped the true God; in subordination to whom they only admitted inferior deities as beneficent and malicious spirits.

YUN, in *Geography*, a city of China, of the second rank, in Yun-nan; 1262 miles S.W. of Peking. N. lat. 24° 32'. E. long. 99° 35'.

YUN, or *Yong-pe*, a city of China, of the first rank, in Yun-nan; 1135 miles S.W. of Peking. N. lat. 26° 44'. E. long. 100° 34'.

YUNA, a river of Hispaniola, which runs into the So-mana bay.

YUNCHA, a town of South America, in the province of Tucuman; 60 miles S. of St. Jago del Estero.

YUNG-KANG, a city of China, of the second rank, in Quang-fi; 1140 miles S.S.W. of Peking. N. lat. 22° 56'. E. long. 107° 26'.

YUNG-NGAN-POU, a town of China, in Chen-fi, on the borders of Tartary; 110 miles N. of Ling-tao.

YUNG-NING, a city of China, of the second rank, in Chan-fi; 300 miles S.W. of Peking. N. lat. 37° 35'. E. long. 110° 39'.

YUNGUS, or VUNGUS VICUS, in *Ancient Geography*, a place of Gaul, on the route from Reims to Treves. Anton. Itin.

YUN-HING, in *Geography*, a city of China, of the first rank, in Ho-nan. The country within its district is very large, and is partly flat, and partly mountainous, especially to the north and south; it is watered by several rivers, which render the soil very fruitful. There are two towns of the second rank, and twelve of the third under its jurisdiction; 430 miles S. of Peking. N. lat. 33°. E. long. 113° 52'.

YUN-LEAN-HO, a canal of China, formed of the river Pay-ho, or rather the river itself made navigable from Hiam-ho, to Tien-tſin, in the province of Pe-tche-li, for the purpose of conveying corn towards Tong-tcheou and Peking. The name in the Chinese language is said to mean corn bearing.

YUN-NAN, a province of China, bounded on the N. by Se-tchuen and Thibet, on the E. by Quang-fi and Koei-tcheou, on the S. by Laos, and on the W. by Ava and Pegu; about 300 miles in length, and 250 in breadth. This province is reckoned one of the most fertile and opulent in China. Its inhabitants are brave, robust, affable, and fond of the sciences, which they cultivate with success: its rivers, gold, copper, and tin-mines; its amber, rubies, sapphires, agates, pearls, precious stones, marble, musk, silk, elephants, horses, gums, medicinal plants, and linen, have procured it a reputation which renders it respectable to the Chinese. Its commerce is immense, as well as its riches, which are said to be inexhaustible. This province contains 21 cities of the first class, and 55 of the second and third. Sir George Staunton estimates the population at eight millions.

YUN-NAN, a city of China, of the first rank, and capital of Yun-nan, situated at the north extremity of a lake. It was formerly celebrated for its extent, and the beauty of its public edifices. Here were seen magnificent buildings, vast gardens, tombs, triumphal arches, and elegant squares; but the Tartars, in their different invasions, destroyed all these monuments; and the city at present contains nothing remarkable: it is, however, the residence of the governor of the province. It comprehends in its district four towns of the second class, and seven of the third; 1152 miles S.S.W. of Peking. N. lat. 25° 6'. E. long. 102° 28'.

YUNTAI, an island near the coast of China, in the Eastern

ZABERN, **CONRAD DE**, in *Biography*, born in Germany about 1450, was a very learned man, and much respected for his morals. He wrote two treatises on music; the first of which is entitled "De Monochordo," and the second "De Modo bene Cantandi." He was much beloved by the emperor Frederic III.

ZEBERN, in *Geography*. See **BERGZABERN**.

ZABI, or **ZABA**, in *Ancient Geography*, a place of Africa, in Mauritania Sitifensis, on the route from Carthage to Cæzarea, between Aræ and Macri. Anton. Itin.

ZABII, or **ZABIANS**. See **SABÆANS** and **SABAISM**.

ZABIN, in *Geography*, a town of Lithuania; 30 miles N.E. of Minsk.

ZABIRNA, in *Ancient Geography*, a river of Asia, in Mesopotamia, which discharges itself into the Tigris.

ZABLOTOW, in *Geography*. See **SABLOTOW**.

ZABLOWICZE, a town of Lithuania; 86 miles E. S. E. of Pinsk.

ZABOLA, a town of Transylvania; 10 miles N. of Cronstadt.

ZABORE, a town of Russia, in the government of Irkutsk; 36 miles S. S. W. of Kirensk.

ZABRZEH. See **HOHENSTADT**.

ZABULISTAN. See **SABLESTAN**.

ZABULON. See **ZEBULON**.

ZABULON, *Tribe of*, in *Ancient Geography*, was bounded on the N. by the tribes of Asher and Naphtali, on the S. by the torrent of Kishon, on the E. by the sea of Galilee, and on the W. by the ocean. Almost all the towns of this tribe were on the plain of Galilee.

ZABULON, a town of Judea, situated on the plain of Galilee, in the tribe of the same name, according to Joshua and the book of Judges. Josephus says, that Cestius, though he admired its beauty, took, pillaged, and burnt it. It was situated S. E. of Ptolemais.

ZABUR, a country of Asia, in Babylonia, in which was the town of Seleucia.

ZABUS, **ZABATUS**, or **Zerbis**, (*Great Zab* or *Zarb*), a river, which is the same with the Lycus, flowed from a source towards the 36th degree of latitude, and directed its course first to the N. W., then to the W., afterwards to the S. W., and finally to the S., discharging itself into the Tigris, about lat. 35° 45'. Xenophon says, that this river, at its entrance into the Tigris, appeared to the Greeks comparable to the Tigris itself. See **ZAB**.

ZABUS Minor, or **Caprus**, (*Lesser Zab*, or *Altun-Sou*), a river of Asia, which had its source E. of Arbelles, and ran towards the S. W., discharging itself into the Tigris, over against Cæne, below or S. S. E. of the greater Zabus. See **ZAB**.

ZACA, in *Geography*, a town of Egypt; 17 miles N. E. of El Arish.

ZACANTHA, in *Ancient Geography*, a town of Hispania, in Iberia, said by Steph. Byz. to have been taken by Hannibal, and to have been called Zacyanthus or Saguntum.

ZACAPA, in *Geography*, a town of Mexico, in the province of Vera Paz; 42 miles S. of Vera Paz.

ZACAPULA, a town of Mexico, in the province of Chiapa; 130 miles S. E. of Chiapa dos Espagnols.

ZACATECAS, a province of Mexico, bounded on the north by New Biscay, on the east by Guatteca, on the south by the provinces of Mechoacan, Guadalaraja, and Chiametlan, and on the west by Chiametlan and Culiacan. It is well inhabited, and abounds with large villages. Part of it lies in the temperate and part in the torrid zone: it is about 100 leagues in length, and 45 in breadth. The

western part of it is an arid tract, and would not be inhabited were it not for the mines, which were formerly reckoned the richest in America; but the eastern part abounds with corn, and fruits of various kinds, and its forests are full of deer.

ZACATECAS, the capital of the fore-mentioned district, the importance of which has declined with the mines. It formerly contained about 12,000 families of Spaniards and mixed breeds, though confining chiefly of one street, in a deep passage between high rocks, crowned with cottages. Luis de Potosi on the S. E. is said by Alcedo to contain only 1600 families of Spaniards, Mulattoes, and Indians, though it has six magnificent churches. The ridge of St. Peter, five leagues from the city, contained rich mines of gold and silver; but they are now in part exhausted, and the fuel has become scarce. The opulence of this city has in course declined, and the chief trade is in goat-skins and tanned leather.

ZACATECAS. See **ST. LOUIS DE Zacatecas**.

ZACATLAN, a town of Mexico, in the province of Tlaxcala; 30 miles N. of Puebla de los Angeles.

ZACATULA, or **SACATULA**, a town of Mexico, in the province of Mechoacan, on a river of the same name, near the Pacific ocean; 95 miles S. of Mechoacan. N. lat. 18° 35'. W. long. 103°.

ZACATULA, a small but fertile province in the dominion of MEXICO.—**ALFO**, a river of Mexico, which runs into the Pacific ocean, near the town of Zacatula.

ZACCARIA. See **TEVO**.

ZACCIA, **PAOLO**, in *Biography*, an eminent physician, was born at Rome in 1585, and in the progress of life was distinguished by his learning, and by his skill in music, painting, poetry, and eloquence, as well as in the more appropriate sciences relating to his own profession. He was physician to pope Innocent X., and celebrated among his contemporaries by various publications; of which the principal is intitled "Questiones Medico-legales, in quibus omnes materiæ medicæ quæ ad legales facultates videntur pertinere, proponuntur, pertractantur, resolvuntur;" a work which has been often reprinted. He was also the author, in Italian, of two esteemed works, "Del Vitto Quadragesimale," 1637, the subject of which is the regimen of diet in Lent; and "De' Mali Ipocondriachi," 1639, a diffuse treatise on hypochondriacal affections. He died in 1659, aged 75. Haller. Eloy. Gen. Biog.

ZACCONI, **P. LONOVICO**, of Pefaro, author of an ample treatise of music, entitled "Prattica di Musica," the first part of which was printed at Venice, 1592, and the second in 1596; a publication in which the author not only proposes to give instructions for the regular composition, but the accurate performance of every species of music. The idea is splendid; but the world has been so frequently deceived by the titles of books, that authors are obliged to abate in their promises, in proportion as the expectations of the public are diminished. If arts and sciences could be acquired by the dead letter of silent instruction, every one who could read, in Italy, might, during the times under consideration, have been a musician. But though no ingenious occupation was perhaps ever yet completely taught by books, without a master, or by a master, without books, yet they are excellent helps to each other. It is hardly possible for a didactic work to satisfy all the doubts that arise in an inquiring mind during solitary meditation; particularly in the first stages of a student's journey through the rugged roads of science. But when he has made some progress, if he should be separated from his guide, the way becomes daily so much more fraught and smooth, that by

the help of these kinds of charts, he will be enabled to advance with tolerable speed and facility by himself.

Zacconi's work, though sometimes dry and tedious, contains much useful and practical knowledge. And as he is almost the only Italian writer on the subject of music who has not bewildered himself in inquiries concerning the systems of the ancient Greeks, or the philosophy of sound, he has had the more leisure for analysing the art, and facilitating the student's progress. This author regarded Okenheim, Josquin, Isaac, Brumel, Mouton, and Senefio, as ancients compared with Willaert, Morales, Cipriano, Zarlino, and Palestrina; and these last, ancient with respect to himself and contemporaries; and says (lib. i. cap. x.), that as the ancient Greeks and Romans produced their musical effects by mere melody, united with poetry, and Josquin and other early contrapuntists, by notes of different lengths, harmonized and worked into perpetual fugue; so the more modern, though the rules of harmony are the same, by a different disposition of concords, inversions, and other contrivances, produce a greater variety of effects.

He likewise observes (cap. xxiii.), that "every age has vainly thought its music brought to as great a degree of perfection as was possible; but it was always found that the next age continues to change, and still to think the same. Okenheim, the master of Josquin, and even in the days of Josquin, John Mouton, his scholar, had the same ideas of their own improvements; yet, since their time, music has not stood still, but made great advances towards perfection, being more light and pleasing."

The change in musical *modes* has continued to our own time, and will doubtless continue to the end of *all* time; for melody, being a child of fancy and imagination, will submit to no theory or laws of reason and philosophy; and therefore, like love, will always continue in childhood.

Zacconi's chief labour and merit in the third book have been the explanation of the moods, and correction of errors in the notation of old composers, to which his work will serve as a useful collection of errata. In Book I. he dwells much on the superiority of the fingering and fingers of his own time, over all that preceded them; and has a long chapter upon the manner of gracing and embellishing a melody, where he tells us, "Che stile si tenghi nel far di gorgia; dell' uso de i moderni *passaggi*, come si *fiorifichino* le cantilene;" and speaks of *aconciature*, as the modern Italians do of *riffioramenti*, or graces. The divisions, however, into which he breaks passages, in order to *embellish* them, if adopted by an operator of the present times, would be like a modern fine lady appearing at court in the furbelows and flounces of queen Elizabeth, or a fine gentleman in the peruke of sir Cloudfley Shovel.

ZACHAN, or SOCHAN, in *Geography*, a town of Hinder Pomerania; 14 miles E. of Stargard. N. lat. 52° 13'. E. long. 15° 28'.

ZACHAREVSKAIA, a fort of Russia, in the government of Ekaterinoflav, on the Konkija; 28 miles W. of Mariupol.

ZACHARIE, JUSTUS FREDERICK WILLIAM, in *Bio-graphy*, was born at Frankenhausen in Thuringia, in 1726; and during the course of his elementary education at his native place, he distinguished himself by various poetical pieces. In 1743 he went to Leipzig to study jurisprudence, but directing his chief attention to the belles lettres, he produced his mock-heroic poem, entitled "Renommisten," which Eichorn, in his History of Literature, says, was the commencement of heroico-comic poetry among the Germans. In the following year, he was admitted as an associate by the young men who contributed to the work published under

the title of "Amusements of Reason and Wit." From Leipzig, where he remained about three years, he removed to Gottingen, where, attracting the notice of professor Klaproth, he was recommended by him to be a member of the German society. In 1748 he was appointed tutor at the Caroline college at Brunfwick, and in 1761 he became professor of poetry in that institution; to which, in the succeeding year, were annexed the offices of inspector of the typographic and bookfelling establishment belonging to the Orphan House, and director of the Brunfwick Intelligencer. From 1768 to 1774, he was editor of the New Brunfwick Gazette; in 1775 he was appointed to the diaconate of St. Syriac, at Brunfwick; and he died in the month of June, 1777, in the 51st year of his age. His biographer states, that "he possessed a very fertile and vivid imagination, with a fine taste, improved by observation and acquaintance with the world. As a poet, he composed with uncommon facility, and tried his talents in almost every species, but was the most successful in the descriptive and heroico-comic. His burlesque poems were distinguished from every thing of the kind that had before appeared in Germany." A collection of Zacharie's poetical works was published at Brunfwick in 1763—1765, 9 vols. 8vo. Gen. Biog.

ZACHARIAH, or ZECHARIAH, one of the minor prophets, who commenced the exercise of his gift in the 8th month of the 2d year of Darius, the son of Hystaspes; and on account of the precision and clearness of his predictions, he has been intitled "the sun among the minor prophets." The most remarkable of his prophecies are those that relate to the advent of the Messiah, and to the destruction of Jerusalem. Dupin.

ZACHARIAS, *Pope*, a native of Greece, succeeded Gregory III. in 741; at a time when the Roman territory was threatened with an invasion by Luitprand, king of the Lombards, and when the sons of Charles Martel were too much engaged by domestic broils to undertake its defence. The pope, therefore, tried how far he might avail himself of the authority of religion in averting the storm; and by a solemn embassy and personal visit, he not only obtained peace, but induced Luitprand to restore to the Roman see four cities which he had taken from it. He also interposed, in 743, with Luitprand on behalf of the exarch of Ravenna, and prevailed with him to desist from an invasion of the exarchate, and to grant peace, as well as to give back the fortrefs of Cefena to the exarch; and in the same year he held a council at Rome to settle some matters of discipline, particularly such as related to the clergy. During the pontificate of Zacharias in the year 746, Carloman, the eldest son of Charles Martel, who had surrendered his dominions to his brother Pepin, went to Rome, and assumed the monastic habit, with which he was solemnly invested by the pope. Rachis, the successor of Luitprand, who, upon his accession to the throne in 747, was peaceably disposed towards the pope and the Romans, took up arms against them; but his hostile purposes were averted by the remonstrances of Zacharias, and those of some of his principal clergy and nobility, who visited his camp, in order to obtain peace; nor were they successful merely in this object; but the result of their interview was Rachis's resignation of his crown, the assumption of the monastic habit conferred upon him by the pope, and retirement to the monastery of Monte Casino, where Carloman resided. In 752 Pepin applied to the pope for permission to seize the crown of France, and to set aside Childeric III.; the pope consented, and Childeric was provided for in a monastery. Zacharias, having displayed talents in the exercise of his office, which gave

him rank among the greatest of the popes, and having established an estimable character by his liberality to the poor, and by his munificence in public works, died in 752, in the 11th year of his pontificate. Some of his decrees and epistles, and also his translation of the dialogues of St. Gregory from Latin into Greek, are extant. Bower.

ZACHAROVA, in *Geography*, a fort of Russia, in the government of Irkutsk; 32 miles N.N.E. of Kirensk.

ZACHAU, a town of Brandenburg, in the Middle Mark; 10 miles E. of Brandenburg.

ZACHAW, **FREDERIC WILHELM**, in *Biography*, an able musician and organist at Halle, in Saxony, was born at Leipzig in 1665. He had the honour and good fortune to have Handel for his scholar. He is still celebrated by the Germans as a master, who had established an admirable school of music at Halle, and as one who was deeply skilled in all the arcana of composition and performance.

ZACHEO, or **DESCHO**, in *Geography*, a small island in the West Indies, between Hispaniola and Porto Rico; about 27 miles N.E. of Mona.

ZACHTLEVEN, **CORNELIUS**, in *Biography*, was born at Rotterdam in 1606, and became an admirable painter of scenes of humour, imitating the style of Bronner; but in subjects of a more sober description, which he also painted, such as farm-houses, kitchens, and the recreations of villagers, &c. he chose the more light and agreeable style of Teniers for his model; and in that style attempted to embody the same description of persons and compositions. In neither, however, of his imitations did he attain an equal degree of spirit or of truth with his prototypes. His works are well composed, and the touch with which they are executed is bold and free; they are not often met with, but are thought deserving of a place in the best collections.

ZACHTLEVEN, **HERMAN**, was the younger brother of Cornelius, and was born at Rotterdam in 1609. He is said to have been the pupil of Van Goyen, but did not follow the style of that master. His principal occupation appears to have been in painting views of the banks of the Rhine and the Meuse. These he executed in a very neat manner, but with a mean and common-place style of selection and imitation. The tones and hues of his pictures are generally cold, but fresh; and as he appears to have had great knowledge of aerial perspective, his distances are well preserved; and the forms drawn with great care and minuteness. He never left Flanders, though it has been asserted that he went to Italy. His drawings are numerous, and are carefully preserved in the best collections. He died in 1685, aged 76. Both he and his brother Cornelius employed the etching-needle, and left several neatly executed plates, from designs of their own.

ZACINTHA, in *Botany*, whether so called by Matthioli, the author of the name, because this plant was originally found in the isle of Zante, or for what other reason, does not appear.—*Matth. Valgr. v. 1. 457. t. 460. Schreb. Gen. 534. Willd. Sp. Pl. v. 3. 1624. Ait. Hort. Kew. v. 4. 468. Sm. Prodr. Fl. Græc. Sibth. v. 2. 145. Tourn. t. 260. Poir. in Lamarck v. 8. 831. Gært. t. 157.*—Clas and order, *Syngenesia Polygamia-æqualis*. Nat. Ord. *Compositæ-semiflosculosæ*, Linn. *Cichoraceæ*, Juss.

Gen. Ch. Common Calyx double: the outermost short, erect, of several lanceolate leaves, membranous at the edges; innermost larger, simple, furrowed, of eight permanent, linear, acute, converging leaves; at length swelling and very prominent at the base. *Cor.* compound, imbricated, uniform: florets equal, perfect, of one petal, ligulate, linear, abrupt, with five teeth. *Stam.* Filaments five, capillary, very short; anthers united into a cylindrical tube. *Pist.*

Germe ovate-oblong; style thread-shaped, the length of the filaments; stigmas two, reflexed. Peric. none, except the interior calyx, which becomes woody, clofed, depressed, with a point, having eight rounded protuberant angles, each scale enfolding one of the marginal fides. *Seeds* solitary to each floret; the marginal ones ovate-oblong, incurved, compressed at the fides, gibbous at the back, tapering below, striated; longitudinally channelled, and villous, in front; central ones oblong, slightly incurved, quadrangular, compressed at the back, striated, smooth. Down fessile, somewhat feathery. *Recept.* naked.

Eff. Ch. Receptacle naked. Seeds of the circumference incurved; of the centre straight. Down very short, finely feathery. Outer calyx membranous; inner with eight protuberances.

1. *Z. verrucosa*. Warty Zacintha. Gært. n. v. 2. 358. Willd. n. 1. Ait. n. 1. Sm. Fl. Græc. Sibth. t. 820, unpublished. (*Lappana Zacintha*; Linn. Sp. Pl. 1141. *Cichorium verrucatum*, Zacintha; Clus. Hist. v. 2. 144. *C. verrucarium*; Ger. Em. 289.)—Native of Italy, Crete, Lemnos, and Zante, as well as of mount Athos. *Sibthorp*. The root of this, the only known species, is annual. *Stems* somewhat leafy, round, smooth, branched and forked, spreading, from a span to eighteen inches high. *Leaves* runcinate, smooth; the radical ones largest and most numerous. *Flowers* yellow, small. The swelling part of the calyx, after flowering, assumes a purple colour. See **LAPPANA** and **RHAGADIOLUS**.

ZACO, in *Geography*, a territory which probably belonged to the province of Adiabene, and was generally comprehended between the Tigris and the Caprus, or Little Zab. The ridges or mountains of Zaco are a part of the Kurdistan region, on which was the road along the Tigris, between Mosul and Jezirah. These ridges were lofty, steep, and rocky, and the path rugged and difficult of ascent. It was part of the road of the 10,000 Greeks in their retreat. The present town of Zaco stands near the northern part of the ridge, denominated from it; and it is the most considerable place that occurs between Mosul and Jezirah; and is surrounded by a fertile district, which produces a great variety of excellent fruits. Zaco stands in an island of the river Kurnib, which descends from the Kurdistan or Carduchian mountains, and falls into the Tigris, a few miles below the town.

ZACONDA, a town of Africa, in the country of Ante, where the Dutch built a fort. It was a considerable town at one time, till in a war between the people of Ante and Adom, it was burnt down by the latter; since which it has never been thoroughly repaired.

ZACUTO, or **ZACUTUS LUSITANUS**, in *Biography*, a physician, was born at Lisbon in 1575, and educated at Salamanca and Coimbra. In his 20th year he took the degree of doctor, and settling in his native city, practised with reputation for thirty years. As he was a descendant of Jewish parents, his dread of the Inquisition, after the edict of Philip IV. against the Jews was issued in 1625, induced him to retire to Holland, where he openly professed the religion of his family, and maintained a character highly respectable, both in his profession as a physician, and in his moral conduct. He died at Amsterdam in the year 1642; and left behind him a collection of works, amounting to 2 vols. fol. The principal of his works are, “*De Medicorum Principum Historia*,” lib. vi. in which he approves himself a strenuous advocate of Galen and the Greek physicians; “*Praxis Historiarum Morborum*,” lib. v.; and “*Praxis Medica admiranda*,” lib. iii. In all his works he blends acuteness of observation with a certain degree of superstitious

superstitious credulity; but they are nevertheless consulted and quoted. Haller. Eloy.

ZACYNTHUS, in *Ancient Geography*, an island of the Ionian sea, W. of that part of the Peloponnesus on which is the Sinus Chelonitis. It is now called *Zante*. Strabo makes its compass 160 stadia. It had many forts, and was very fertile. In this isle was a town of the same name, situated in the eastern part, with a citadel. According to Dionysius of Halicarnassus, it derived its name from Zacynthus, son of Dardanus, who, accompanied by a number of Phrygians, settled here. According to Thucydides, the first Greeks known in this island were Achæans, who came hither from Achaia. It passed under the dominion of Philip, king of Macedon, who surrendered it to Amynder, king of the Athamans, who confided the government of it to Philip of Megalopolis, by whom it was transferred to Hierocles of Sicily. After the defeat of Antiochus at Thermopylæ, Hierocles sold it to the Achæans. Livy says, that the town and citadel were assaulted and captured by Levinus; and Pausanias informs us that it was called Plophis. According to Scylax it had one port; and Pliny says that it was very fertile, and that its port was named Hyrie; but P. Mela distinguishes Hyrie from Zacynthus.

ZACYNTHUS, a town of Africa, in Libya. Steph. Byz.
ZACYNTHUS, an epithet used by the ancients to a liquid bitumen, from the island Zante.

ZAD, in *Geography*, a name given to the Niger of Africa, in Bornou, which is described in Horneman's Journal as flowing eastwards. Its breadth was given to him for one mile, and he was told that it flowed towards the Egyptian Nile, through the land of the heathens. The course here given is directly towards the Congo; and it is said, that Zad is the name of the Congo at its mouth, and it is the name of the Congo for at least 650 miles inland.

ZADADRUS, in *Ancient Geography*, a river of India, on this side of the Ganges; which received the waters of the Hypasis and Adris, according to Ptolemy.

ZADAN, in *Geography*, a town on the west coast of the island of Celebes. S. lat. 2° 55'. E. long. 119° 9'.

ZADAON, a river of Portugal, which runs into the Atlantic, near Setuval.

ZADELSDORF, a town of Saxony, in the circle of Neulat; 3 miles S.S.E. of Auma.

ZADONZK, a town of Russia, in the government of Voronez, on the Don; 92 miles N. of Voronez. N. lat. 53° 4'. E. long. 39° 14'.

ZADRACARTA, in *Ancient Geography, a very large town of Asia, the capital of Hyrcania, according to Arrian.*

ZADRAMA, a town of Arabia Felix, the capital of the Cinædocolpites. Steph. Byz.

ZADRAN, in *Geography*. See **HATVANY**.

ZADRIS, in *Ancient Geography*, a town of Asia, in the interior of the Colchide. Ptol.

ZADURA, in the *Materia Medica* of the ancients, a name given to a foreign root, which was round and smooth, and of the colour of ginger.

It was at that time imported from the Indies, and greatly esteemed in petulantial cafes.

ZÆA, or **ZEA**, in *Ancient Geography*, a very ancient town of Greece, in Bœotia. Steph. Byz.

ZÆTIA, or **ZETIA**, a town of Arcadia, N. of Megalopolis. It had two temples, one of Ceres, another of Diana.

ZEZAR, in *Geography*, a town of Spain, in the province of Murcia; 22 miles N.W. of Murcia.

ZAFANIN, a town of Fez, near the coast of the Mediterranean; 35 miles S.E. of Melilla.

ZAFARANBOLI, a town of Natolia; 28 miles S. of Amasieh.

ZAFFABEN, a word used by some of the chemical writers to express putty.

ZAFFE IBRAHIM, in *Geography*, a town on the east coast of Madagascar. S. lat. 17°.

ZAFFER, **ZAFFRE**, or **SAFFRE**, in *Chemistry*, is the residuum of cobalt, after the sulphur, arsenic, and other volatile matters of this mineral have been expelled by calcination: so that it is a kind of calx or oxyd of cobalt, mixed with a portion of siliceous matter, of a grey or reddish colour; in which state it is imported from Saxony. It is used to produce a very fine blue colour, when it is melted with fusible and vitrifiable matters.

The blue colour produced by the vitrification of zaffer proceeds from the earth or calx of a semi-metallic substance contained in cobalt, called by chemists *regulus of cobalt*. This is proved by melting zaffer with a reducing flux, like any other roasted ore, by which means the regulus will be obtained. The scoria in this fusion has also a blue colour, proceeding from a portion of the calx of the regulus that is not reduced, but is vitrified together with the scoria. The calx, therefore, or metallic earth of the regulus of cobalt, is the sole cause of the blue colour produced by zaffer.

But as this is contained in cobalt in various quantities, some zaffers produce more blue than others. The heterogeneous fixed matters contained in cobalts contribute, according to their quantity, not only to the greater or less intensity of the blue colour, but also to its lustre and beauty; and, therefore, those who manufacture zaffer from cobalt make frequent essays of the roasted ore, by mixing it with vitreous matters, in order to discover the intensity and beauty of the blue colour.

Good cobalt calcined would form too deep a blue, and almost a black glass, if it were not previously mixed with a certain quantity of vitreous frit. In the manufacture of zaffer, therefore, the calx of cobalt, the strength of which has been determined by previous essays, is mixed with such a quantity of sand, or of powdered flints and quartz, that with the addition of some saline flux, a deep blue glass may be formed. See **COBALT**.

The zaffer that is commonly sold, and which comes from Saxony, is a mixture of oxyd of cobalt with some vitrifiable earth: it is of a grey colour, and some zaffers are clearer than others, according to the intensity of the colour which they are capable of producing.

Zaffer is employed in the manufacture of pottery and of porcelain, for painting the surface of the pieces of ware, upon which it is applied, together with some saline flux, previously to the baking or glazing, that the same fire may vitrify this colouring material.

The blue of zaffer is the most solid and fixed of all the colours that can be employed in vitrification; it suffers no change from the most violent fire. It is successfully employed to give shades of blue to enamels, and to the crystal glasses made in imitation of some opaque and transparent precious stones, as the lapis lazuli, the turquois, the sapphires, and others of this kind.

To prepare zaffer for use in the glass-trade, put it in gross pieces into earthen pans, and let it stand half a day in the furnace; then put it into an iron ladle to be heated red-hot in the furnace; take it out while thus hot, and sprinkle it with strong vinegar: and when cold, grind it on a porphyry to an impalpable powder, then throw this into

water

water in glazed earthen pans; and when it has been well stirred about, let it settle and pour off the water: repeat this washing often, and the foulness of the zaffer will be thus wholly separated. Dry the powder, and keep it for use.

ZAFFRAM, a word used often by authors to express saffron, but sometimes as the name of other things of a yellow colour; thus ochre was called by this name.

ZAFFRAMEN, a word used by some medical writers to express saffron.

ZAFRA, in *Geography*, a town of Asiatic Turkey, in the government of Marasch; 15 miles S.W. of Tarsus.—Also, a town of Asiatic Turkey, in the government of Trebifond, on the Black sea; 50 miles N.W. of Trebifond.—Also, a town of Spain, in Estremadura; 22 miles E. of Xeres de los Caballeros.

ZAFRANIA, in *Colours*, a term used by the Greeks to express the yellow of saffron. The barbarous writers of the after-ages translated it into the Latin *crocietas*, or saffron colour.

The later Greek writers only use it, and they have taken it literally from the Arabians, Avicenna, and Serapio. This was a term used by them to express the colour of the fine bole-armenic of Galen, which they tell us stained paper to a fine and beautiful gold colour.

ZAGA, in *Botany*, Poiret in Lamarck Dict. v. 8. 831. (*Zaga* Pohon, or *Corallaria latifolia*, Rumph. Amboin. v. 3. 175. t. 110.)—This is one of those trees, whose hard red seeds are used for ornament, in the form of necklaces, bracelets, &c. by the natives of tropical climes, and even by the inhabitants of the most polished countries of Europe, as fashion, from time to time, is pleased, in her capricious wisdom, to ordain. Such are the beautiful red and black seeds of *Abrus precatorius*, of which there is a pearly white variety, of rare occurrence. Such also are those much larger seeds, of the same combination of colours, produced by the West Indian genus *ORMOSTA*. (See that article.) The *Zaga* of Rumphius and Poiret is evidently a papilionaceous plant, with pinnate leaves, composed of about three pair of elliptic-oblong, entire, stalked, rather large leaflets, with an odd one. Flowers in paucified terminal clusters. Legumes elliptic-oblong, pointed, hard and smooth, each containing one, rarely two, hard, shining, round seeds, all over of the colour of red coral, larger than those of *Adenanthera pavonina*, being as broad as the fore-finger nail, and destitute of the defined circumscribed area, for which the seeds of the *Adenanthera* are remarkable.

ZAGALA, in *Geography*, a town of Spain, in Estremadura; 25 miles S. of Alcantara.

ZAGAN, a town of the principality of Georgia, in the province of Kaketi; 3 miles N. of Tefisi.—Also, a town of Persia, in the province of Irak; 12 miles S.W. of Hamadan.

ZAGARA, a mountain of Greece, in Livadia, anciently called Helicon.

ZAGATHAI, a name given from the second son of Zingis to Great Bucharia; which see.

ZAGATIS, in *Ancient Geography*, a river of Asia, in the Colchide, according to Arrian, who fixes its mouth between Athenæ and Anchiane Regia.

ZAGAWA, in *Geography*, a city of Africa, in Bornou, on a river which runs into the same lake, where the Niger is by some supposed to be lost. N. lat. 19° 10'. E. long. 25° 50'.

ZAGGOS, a mountain of Africa, in which are some mines of salt; 100 miles S. of Algiers.

ZAGHARA, a town of Africa, in Bornou.

ZAGI. See **ZEGI**.

ZAGILLONITIS, in *Ancient Geography*, a country of Asia, in Cappadocia. Strabo.

ZAGING, in *Geography*, a town of Austria; 3 miles N. of St. Polten.

ZAGIRA, in *Ancient Geography*, a town of Asia, in Paphlagonia, at a small distance from the sea. Ptol.

ZAGLIA, in *Geography*, a town of the island of Corfica; 8 miles S.E. of Calvi.

ZAGORA, a town of European Turkey, in Romania, on a lake which communicates with the Black sea; 12 miles S.W. of Burgas.

ZAGORA, in *Ancient Geography*, a town of Asia, in Paphlagonia, on the coast of the Euxine sea, between Carula and the mouth of the river Halys, according to the Periplus of Arrian.

ZAGOROLO, in *Geography*, a town of the Popedom, in the Campagna di Roma; 3 miles W. of Palestrina.

ZAGOROW, a town of the duchy of Warlaw; 20 miles S. of Kalisch.

ZAGRAB. See **AGRAM**.

ZAGROS MOUNT, a mountain of Persia, in the province of Irak, along the brink of which extends the district of Kurrend, from the vicinity of Holwan to the village of Goor. It is covered with forests of oak, and inhabited by an extraordinary race of men, among whom subsist customs similar to those of the Kadmusia in Syria, described by Volney. It is said that in their nocturnal festivals, the garments of the fair sex, at the expiration of a certain period, are thrown into a heap, and jumbled together. The lights are then extinguished, and the clothes being regularly distributed among the men, the candles are relighted; and it is settled by the rules of the society, that the lady must patiently submit to the embraces of the person who has become possessed of her dress, whether father, son, husband, or brother. The lights are then once more extinguished, and all of this licentious tribe pass the remainder of the night in the indulgence of the most promiscuous lust.

ZAGRUS, or **ZAGRIUS MONS**, in *Ancient Geography*, a mountain of Asia, in Media. It made a part of mount Taurus, commencing in Armenia, and extending as far as the Chalonitide, between Media and Adiabene. Pliny. It is reckoned by Ptolemy one of the most considerable countries in Media. According to Strabo, it was this chain of mountains which touched the Niphates, and separated Media from Babylonia.

ZAGU, in the *Materia Medica*, the name given by some authors to the sago-tree, the *todda pauna*, or *palma fructu pruniforme*.

ZAGUANANAS, in *Geography*, a river of considerable length in New Mexico, which flows from the same sources with the Rio Bravo, and joins the *Colorado*; which see.

ZAGYTIS, in *Ancient Geography*, a country of Africa, in Libya. Steph. Byz.

ZAHARA, in *Geography*, a town of Spain, in the province of Seville. In 1407, this town was taken from the Moors; about two years after the Moors retook the town, but not being able to reduce the citadel abandoned it. In 1481, it was surprized by the Moors, in a dark stormy night; most of the inhabitants were put to the sword, and the rest sent slaves to Grenada; 36 miles S.E. of Seville. N. lat. 36° 50'. W. long. 5° 33'.

ZAHARA. See **SAHARA**.

ZAHIA, a word used by the Arabian physicians to express a sort of dysentery, in which there was a very large

large discharge of blood from the rectum, attended with an evident sensation of abrasion, or pain in the bowels.

ZAHNA, in *Geography*, a town of Saxony; 8 miles N.E. of Wittenberg. N. lat. 51° 56'. E. long. 12° 54'.

ZAHRADKA, a town of Bohemia, in the circle of Czeclau; 17 miles S.S.W. of Czeclau.

ZAHRINGEN, an ancient citadel in the Brisgau, which gave the title of duke to a noble family that became extinct in the 13th century; 1 mile N. of Friburg.

ZABAC, one of the many names by which the ancient chemists have called mercury.

ZAIDIR, a name by which some of the chemical writers have called verdigrise, or the rust of copper; and others, the metal itself; and some brass.

ZAIM and **TIMAR**, lordships granted under those names in the Ottoman empire for life, as military rewards and encouragements. Those who possess a zaim, or timar, are honoured with the title of aga; they are bound to a military personal service, and obliged to bring with them to war one or more *gébélis*, horsemen or foot-soldiers, armed and equipped according to the revenue and extent of the lordship. The timar differs in no respect from the zaim, except that it is of less value, and that the aga who possesses it does not arm as many horsemen and foot-soldiers as the other. The number of zaims in Turkey in Europe is 914, and that of the timars is 8356. Nearly the same number is reckoned in Asia, which furnishes, with the *gébélis*, a militia of upwards of 60,000 men, better disciplined, and more inured to war than the spahis and the janizaries. This militia for a long time constituted the principal force of the Ottoman empire; to this principally the first sultans were indebted for the astonishing success of their arms, and the rapid progress which they made in a little time in Asia, in Europe, and even in Africa.

On the death of a zaimat, or a timariot, the sultan is to draw a year's revenue from the lordship, and nevertheless, give it up again to the son of an aga, a spahis, or any other military man, especially to him who, by a brilliant action, has distinguished himself in battle, who has first mounted to the assault, penetrated into the enemy's intrenchments, killed a great number of infidels, or contributed to put them to the rout. But since the sultans prefer to the fatigues of war and the dangers of battle the tranquillity of their seraglio, and the pleasures of their harems; and more especially since avarice and a love of gain have caused to be put up to auction the places intended for the recompense of valour and merit, the lordships are become the patrimony of the rich and of intriguers. Thus the best institutions degenerate; thus the Mussulman, formerly intrepid and valiant, becomes merely a vile plunderer, or a ferocious assassin; and the Ottoman armies, so formidable to their enemies, are become an object of contempt or pity, and this vast empire would no longer exist, if some European power were not interested in its support.

ZAIN, in *Horses*, a term used by the French to signify a horse of a dark colour, neither grey nor white, and without any white spot or mark upon him in any part. See **HORSE**.

ZAINAH, in *Geography*, a town of Algiers, in the province of Constatina; supposed, from some considerable ruins, to have been Zama, an ancient and royal city of Numidia; 25 miles S.E. of Seteef.

ZAINE, or *Wadel Berber*, a river of Africa, which runs into the Mediterranean, N. lat. 36° 54'. E. long. 9° 16'.

ZAIRA KAKONGO, an island in the Atlantic, at the mouth of the river Zaire.

ZAIRAGIA, or **ZAIRAGIAH**, a kind of divination in use among the Arabs; performed by means of divers wheels, or circles, placed concentric to one another, and noted with several letters, which are brought to answer to each other, by moving the circles according to certain rules.

This is also called *zariab*, because the circles of this machine, which are called *mutaxariat*, *laflak*, &c. are intended to correspond to the orbs of the planets, and the atmospheres of the several elements.

ZAIRE, or **SAIRE**, in *Geography*, a river of Africa, which rises in the country of Matamba, about S. lat. 10°, and takes a northerly course to lat. 3°, in the kingdom of Congo; after which it takes a south-westerly direction, and runs into the Atlantic, S. lat. 6°. E. long. 12° 20'.

It has been an important question, with regard to which geographers have entertained various opinions, what are the course and termination of the Niger. The ingenious geographer, Mr. Rennell, on comparing the various accounts of the progress of the Niger beyond Houffa, declared his opinion to be, that its waters had no communication, either with the river Nile, as was thought, or with the sea, as others imagined; but that they were spread out into a great lake in Wangara or Ghana, and evaporated by the heat of the sun. (See **NIGER**.) Mr. Park, the late African traveller, directed his particular attention to this subject, and was induced to conclude that the Congo would be found to be the termination of the Niger from the following considerations: 1. The total ignorance of all the inhabitants of North Africa respecting the termination of that river. If the Niger ended any where in North Africa, it is not easy to account for this total ignorance, and for their so generally describing it as running to the Nile; and in fact, to a country with which they had not any acquaintance. A second consideration has been already suggested under the article **ZAD**. A third is deduced from the general supposition that the river of Dar-Kulla, mentioned by Mr. Browne in his "Travels," was the Niger, or at least that it communicated with that river; and this, it is said, would be exactly the course which the Niger ought to take in order to join the Congo. 4. The quantity of water discharged into the Atlantic by the Congo cannot be accounted for on any other principle, but that it is the termination of the Niger. If the Congo derived its waters entirely from the S. side of the mountains, which are supposed to form the belt of Africa, one would naturally suppose, that when the rains were confined to the N. side of the mountains, the Congo, like the other rivers of Africa, would be much diminished in size; and that its waters would become pure. On the contrary, the waters of the Congo are at all seasons thick and muddy. The breadth of the river, when at its lowest, is one mile, its depth is fifty fathoms, and its velocity six miles *per* hour. 5. The annual floods of the Congo commence before any rains have fallen south of the equator, and agree correctly with the floods of the Niger, calculating the water to have flowed from Bambarra at the rate of three miles *per* hour. Mr. Park, during his residence in Scotland, became acquainted with a Mr. George Maxwell, formerly an African trader, who was well acquainted with the whole western coast of Africa, more especially S. of the equator, and had published a chart of the river Congo. Mr. M. had been led by a variety of circumstances to conjecture that the source of the Congo lay considerably inland, and far to the north; and from a perusal of Mr. Park's travels

he concluded, that the Congo and the Niger were one and the same stream. Mr. Maxwell's reasoning confirmed Mr. Park in his opinion; and in this opinion he persevered to the end of his life.

Since the discoveries of Mr. Park, it is very generally allowed that the course of the Niger is from west to east; and his opinion with regard to its termination in the Congo, or, as it is sometimes called, the Zaire, has received a considerable degree of confirmation from the account of the Congo given by Mr. Maxwell. "Before ever the Niger came to be the topic of conversation," says Mr. M., "it struck me, that the Congo drew its source far to the northward, from the floods commencing long before any rains take place S. of the equator; since it begins to swell perceptibly about the latter end of October, and no heavy rains fet in before December, and about the end of January, the river must be supposed to be at its highest. At no time, however, can the rains to the southward of the line be compared with those in the Bight of Guinea, where ships are obliged to have a house erected over them during these months."—"If the Niger has a sensible outlet, I have no doubt of its proving the Congo, knowing all the rivers between Cape Palmas and Cape Lopus to be inadequate to the purpose; nor need the immense course of such a river surprise us, when we know that the river St. Lawrence, contemptible in size compared with the Congo, encompasses the whole of North America, issuing through a chain of lakes. But instead of seven or eight lakes, the Congo may be supposed to pass through seventeen or eighteen; which will solve any difficulty as to the floods of the Niger not immediately affecting the Congo." He adds, the river Congo, compared with other rivers, must rank as the third or fourth in magnitude. Considering the force of the current it produces in the sea, carrying out floating islands sixty or seventy leagues from the coast, the Amazon or Plata only can cope with it. At the distance of 600 miles from its mouth, the Congo traders report that it is as large at the place from which they came, and that it went by the name Enzaddi, as it does among all the nations upon the coast. If the shallow water opposite to Suenda should be thought to detract from the assumed size of the Congo, it should be considered, that the river there is spread out ten miles in width, the middle channel of which has never been accurately founded. "It has long been my opinion, that Leyland's or Molyneux island at Embomma, (a settlement on the banks of the Congo, distant thirty leagues from its mouth,) either of which might be rendered as impregnable as Gibraltar, at a very small expence, could be a choice station for establishing an extensive commerce with the interior of Africa. Indeed, if the idea of the Congo being the outlet of the Niger prove to upon trial, we may consider it as an opening designed by Providence for exploring those vast regions, and civilizing the rude inhabitants." The Congo appears from other testimonies to be a river of the first class, and larger, probably, than the Nile. The waters of the Congo, it is said, may be distinguished at sea more than thirty leagues from the coast; and the water is fresh at the distance of thirty miles. If these accounts are thought to be exaggerations, it is a general opinion among navigators that this river has a wonderful size and force. "All accounts concur in representing that the stream of the Congo is of a more uniform height, and subject to much less variation from the dry and rainy seasons, than any tropical river which is known; and that on a comparison with such rivers, it may be considered to be in "a perpetual state of flood." The average rising of the Ganges in the rainy season is stated by

major Rennell to be thirty-one feet, being almost the same with that of the Nile; whereas, the difference between the highest point of the Congo about February, and the lowest, in September, is only about nine feet; and the river, at the latter period, has all the appearance to a stranger of being in full flood. It is this remarkable peculiarity which distinguishes the Congo from other great rivers of a similar description, and which leads to important conclusions with regard to its origin and cause. "In support then of the hypothesis which identifies the Congo with the Niger, the following arguments deduced from the preceding facts and observations may be alleged: 1. The great magnitude of the Congo. 2. The probability that this river is derived from very remote sources, perhaps considerably north of the equator. 3. The fact, that there exists a great river N. of the equator (the Niger), of which the termination is unknown, and which may, perhaps, form a principal branch of the Congo.

"Such being the evidence in favour of the hypothesis respecting the Congo, the objections must be admitted to be weighty and formidable: the principal of these are, 1. That it supposes the course of the Niger to be through the vast chain of the mountains (anciently *Montes Lunæ*), the great central belt of Africa."—"It is difficult to understand how the Niger could penetrate this barrier, and form a passage southwards. 2. The course of the Niger, estimated from its source in the mountains of Senegal, (supposing it to be the same river with the Congo, and to flow by Wangara and Casina, through the centre of Africa into the Atlantic,) would be considerably more than 4000 miles. But the course of the Amazon, the greatest river in the old or new world, is only about 3500 miles; and although the existence of a river considerably greater than any yet known may be within the limits of physical possibility, yet so improbable a supposition ought not to be adopted upon flight or conjectural reasoning, or upon any thing much short of distinct and positive proof."

The editor of Mr. Park's *Travels*, &c. in 2 vols. 8vo. 1816, which we are now citing, very laudably expresses a hope, "that this distinguished river, which hitherto has been only known as one of the greatest marts of the Slave Trade, may at length be rendered conducive to objects of civilization and science; and that some use will now be made of this great inlet into Africa, for the purpose of exploring a part of that continent which as yet is entirely unknown; or, at least, of obtaining more complete and authentic information relative to the Congo itself, which must unquestionably be considered as a very curious and interesting subject of inquiry."

Another opinion with regard to the termination of the Niger has been advanced by M. Reichard, a German geographer, and published in the "Ephemerides Geographiques," at Weimar, in August 1808. This opinion is, that the Niger, after reaching Wangara, takes a direction towards the south, and being joined by other rivers from that part of Africa, makes a great turn from thence towards the south-west, and pursues its course till it approaches the north-eastern extremity of the gulf of Guinea, where it divides, and discharges itself by different channels into the Atlantic; after having formed a great Delta, of which the Rio del Rey constitutes the eastern, and the Rio Formosa, or Benin river, the western branch. This hypothesis, though it diminishes the distance which the Niger has to flow in its course to the Atlantic, does not remove the objection arising from the Niger's being conceived to penetrate the Kong mountains. But we must not pursue this subject

any farther. For the lengths of the course of the most noted rivers, see RIVER.

ZAKA. See SCHAREDSJE.

ZAKEPH GADHOL, *Rex Pauperrimus*, one of the Hebrew accents, sometimes denoting no kind of pause, and marked over a letter thus (ז̄).

ZAKEPH Katon Rex, one of the Hebrew accents, constituting either a comma or semicolon, and marked over a letter thus (ז̄).

ZAKERZEZIN, in *Geography*, a town of Kurdistan; 26 miles N.N.W. of Van.

ZAKIEH, a town of the Arabian Irak, on the Tigris; 10 miles N. of Korna.

ZAKLIKOW, a town of Austrian Poland, in Galicia; 40 miles S. of Lublin.

ZAKROCZYN, or **SAKROTSCHIM**, a town of the duchy of Warlaw, on the Narew. In 1704 the confederate Poles were defeated here by the Russians; 40 miles N.W. of Warlaw.

ZAL ALEKSANDROVSKOI, a bay of the Caspian sea; 260 miles S.S.E. of Atrachan. N. lat. 43°. E. long. 51° 14'.

ZALA, in *Botany*, so called by Loureiro, Cochinch. 405, from *ζαλα*, a *tempes*, or agitation of the sea, because the plant floats, and is driven about, at the mercy of the winds and waves. This is no other than the **PISTIA** of Linnæus (see that article); where the generic characters, as corrected by Schreber, come sufficiently near to those of Loureiro, to leave no doubt in the mind of the reader, allowance being made for the peculiarities of structure in so singular a flower.

ZALA, in *Ancient Geography*, a town situated in the vicinity of Amafra, which was a town of the Peloponnesus, in Achaia Propria.

ZALA, in *Geography*. See **WADAN**.

ZALACA, in *Ancient Geography*, a town of Asia, in the interior of Media. Ptol.

ZALACUS, a town of Africa, in Mauritania Cæsariana. Ptol.

ZALACUS Mons, (*Van-nasb-reefs*), mountains of Mauritania, at some distance from and to the S. of the river Chinalaph. Ptol.

ZALAKNA, in *Geography*, a town of Transylvania; 14 miles W. of Weissemburg.

ZALAMEA, a town of Spain, in the province of Seville; 38 miles W.N.W. of Seville.

ZALAMEA de la Serena, a town of Spain, in the province of Eltremadura. This town was anciently called Ilipa, and many vestiges remain of its former splendour; 27 miles N.E. of Llerena.

ZALANTZ, a town of Hungary; 10 miles S.E. of Cafchau.

ZALANTZ, in *Ancient Geography*, a town of Africa Propria, S. of Adrumetum. Ptol.

ZALESCE, in *Geography*, a town of Austrian Poland, in Galicia; 32 miles S. of Lemberg.

ZALEUCUS, in *Biography*, a philosopher and legislator of Greece, and founder of the Locrian state, flourished in the 7th century B.C. He was of obscure birth, and lived in servitude as a shepherd; but his extraordinary abilities and merit attracted notice even in his humble station, and advanced him to the government. His laws were deemed severe, but being adapted to the circumstances and manners of the Locrians, their constitution was for several ages highly celebrated. His discipline was rigorous, so that he prohibited the use of wine, otherwise than as a medicine;

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and he ordained, that adulterers should be punished with the loss of their eyes. When his son had incurred this penalty, he blended paternal lenity with a pretence of maintaining the authority of the laws, by ordering his son to be deprived of one eye, and by submitting to the loss of one of his own eyes. In order to secure the permanent stability of his system of legislation, he required that a person who proposed a change in any one of them should come before the assembly with a cord about his neck, that he might be instantly strangled, if upon examination the old law were preferred. Valer. Max. Diod. Sic. Laert. Brucker by Enfield.

ZALGIN, in *Geography*, a town of the island of Cuba; 47 miles N. of St. Jago.

ZALIKARA, the most considerable city of Mingrelia, situated on the right bank of the Hippus, which rises in the highest mountain of the Soane, not far from the source of the Phasis, flows through Letighuani, divides Mingrelia from Iberia, and enters the Phasis near the Tredia: an open place, at the confluence of the Hippus and Phasis, well peopled by different nations, particularly Jews.

ZALISCUS, in *Ancient Geography*, a river of Asia, in Galatia. The mouth of this river in the Euxine sea lay between Cyrtafia and Galorum.

ZALISSA, a town of Asiatic Iberia. Ptol.

ZALLANT, in *Geography*. See **SALLAND**.

ZALSSING, a town of Austria; 5 miles N.W. of Agglpach.

ZALUZIANSKIA, in *Botany, so named by Necker, in "Act. Palat. v. 3. phys. 303," according to Willd. Sp. Pl. v. 5. 538, is no other than **MARSILEA quadrifolia**, which the reader will find in vol. xxii. The above name is designed, as we presume, to commemorate a Polish botanist, author of *Methodi Herbaria*, published at Prague, anno 1592, in 4to., and at Frankfort in 1604. This work is spoken of by Haller, *Bibl. Bot.* v. 1. 387, as a transposition of the arrangement of Dodonæus, without any improvement or additional information.*

ZAM, in *Geography*, a town of Grand Bucharia; 85 miles N.W. of Bask.

ZAMA, a town of Peru, in the diocese of Arequipa; 30 miles N. of Arica.

ZAMA, in *Ancient Geography, a town of Africa Propria, 5 journeys from Carthage. This town, to which ancient authors give the title of royal and a fortress, is famous in the wars of Jugurtha and Juba, and more especially on account of a battle between the Carthaginians under Hannibal and the Romans, commanded by Scipio, in the year 551 of the Republic. At the time when this town was in a flourishing state, it was assigned to Numidia. Cornelius Nepos says, that it was 300 miles from Adrumetum. Appian says 3000 stadia. It was situated on a plain, and owed its strength to its fortifications more than to its situation. Hirtius says, that it was the ordinary residence of king Juba, where he had his wives, children, and treasures. Pliny says, that it became a Roman colony.*

ZAMA, a town of Cappadocia, in the prefecture of Chamane.—Also, a town of Asia, in Mesopotamia. Ptol.

ZAMAMIZON, a town of Africa Propria, between the town of Tabraca and the river Bagradas. Ptol.

ZAMBOSE, or **CUMANA**, in *Geography*, a river of Africa, which rises in the interior parts of Mocaranga, and runs into the Indian sea at several mouths: the principal of which takes the name of Luabo. S. lat. 19°. E. long. 37°.

ZAMBOZIN, a town of Congo; 24 miles S.S.W. of St. Salvador.

ZAMBRANO, JUAN LUIS, in *Biography*, a Spanish

painter,

painter, was born at Cordova in 1599. He was a disciple of Paolo de Céspedes, and was a successful follower of the style of that master. His principal works are in the cathedral at Cordova, and in the church of the convent of Los Martyros, where he painted two altar-pieces, representing the stoning of St. Stephen, and the martyrdom of St. Acifelo and St. Victoria. In the colegio di Santa Catalina is a fine picture by him of a guardian angel, and a St. Christopher, which Palomino describes as designed in the great style of M. Angelo. He passed the latter part of his life at Seville, where he painted several altar-pieces for the church of St. Basil, and died in that city in 1639, at the age of 40.

ZAMBROKRI, in *Geography*, a town of Hungary; 14 miles S.W. of Rosenberg.

ZAMBROW, a town of the duchy of Warsaw; 80 miles N.E. of Warsaw.

ZAMECH, a name given by some writers to the lapis lazuli.

ZAMETUS, in *Ancient Geography*, a mountain of Arabia Felix. Ptol.

ZAMFARA, or ZANFARA, in *Geography*, a town of Africa, and capital of a kingdom of the same name; 170 miles E.N.E. of Wangara. N. lat. 18° 20'. E. long. 16° 15'.

ZAMIA, in *Botany*, from *ζημια*, *damage*, or *loss*. This name, which first occurs, as the appellation of a genus, in the Gen. Pl. ed. 6. of Linnæus, is taken from Pliny, who uses it for such cones of the fir as "split while they are upon the tree," and, as he says, "require to be taken off, that they may not injure the rest." This should seem to apply to the male catkins, however false the phythology of Pliny, and the practice founded upon it, may be. Our *Zamia* answers to his, merely in the cone-like form of its fructification, which, being male on one plant, and female on another, exhibits in the former the appearance of loss, or sterility, like the male catkins of the fir.—Linn. Gen. 574. Suppl. 68. Schreb. Gen. 778. Willd. Sp. Pl. v. 4. 845. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 410. Brown Prodr. Nov. Holl. v. 1. 348. Pursh 648. Juss. 16. Poir. in Lamarck Dict. v. 8. 831. Lamarck Illustr. t. 892. Gært. t. 3.—Clafs and order, *Dioecia Polyandria*. Nat. Ord. *Filices*, Linn. Juss. *Cyca-deæ*, Perfoon, Brown.

Gen. Ch. Male, *Cal.* Catkin ovate, tessellated-scales horizontal, obtuse, thickened towards the end, permanent. *Cor.* none. *Stam.* Filaments none; anthers numerous, sessile, crowded on the under side of each scale, especially towards the extremity, elliptical, smooth, of two valves and one cell, splitting lengthwise.

Female, *Cal.* Catkin ovate, tessellated: scales horizontal, obtuse, more or less peltate, permanent. *Cor.* none. *Pist.* Germens two, oval, sessile, horizontal, inflexed, on the under side of each scale, near the extremity; style very short, somewhat conical; stigma obtuse, undivided, pervious. *Peric.* Drupa roundish, somewhat angular, of one cell. *Nut* hard, roundish or elliptical, of one cell.

Ef. Ch. Male, Catkin tessellated. Scales abrupt. Anthers oval, sessile at the under side of each scale. Female, Catkin tessellated. Scales peltate. Drupas two, at the under side of each scale.

Obs. Mr. Brown, to whom we are obliged for the remark of the style being finally pervious, records an idea of the late Mr. Dryander, that the American *Zamia*, which constitute the original genus, having more perfectly peltate scales to the male catkin, and the anthers assembled in two distinct masses might possibly form a distinct genus from

the Cape and New Holland species; more especially as in these American plants, the leaflets are each manifestly articulated with a projection from the main rib of the leaf; whereas in the others they are either very obscurely jointed, or perfectly decurrent. We conceive, however, that they all together compose a very distinct genus, which cannot, without violence to nature, be divided. It is nearest akin to *Cycas*, but differs essentially in the female part of the fructification being a catkin, whose scales bear two germens underneath; instead of an assemblage of fronds, or leafy receptacles, bearing an indeterminate number upon their margins. The herbage is perennial, generally without a stem. Leaves abruptly pinnate, singularly hard, rigid, and often spinous; rarely lobed. Catkins radical, stalked.

It being extremely difficult to obtain and to compare good specimens of the different species, as well as to detect and define their essential characters, authors have not very clearly described them. Jacquin has published magnificent figures of several; but their most satisfactory marks require to be sought at an earlier period of their growth, and in more minute parts, than he has generally exhibited.

1. *Z. cycadifolia*. Sago-palm-leaved *Zamia*. Jacq. Fragm. 27. t. 25, 26. Willd. n. 1.—Leaflets very numerous, two-ranked, linear, entire, with simple spinous points; common stalk femicylindrical, channelled, downy. Catkin of the fruit elongated, somewhat cylindrical.—Native of the Cape of Good Hope. Cultivated in the Imperial gardens at Schoenbrunn, but not mentioned by Mr. Aiton as known to our English collectors. The thick globular scaly head of the root, near a foot in diameter, bears numerous spreading pectinate leaves, very much resembling, at first sight, those of *Cycas revoluta*. The stalk of each is, in its naked part, two feet long, as thick as a swan's quill, all over downy, as is also its leafy portion, and the young leaflets themselves. The full-grown leaflets are from 50 to 80, rigid, parallel, acute, pungent, each about three inches long; the lowermost gradually shorter, and rather more distant. The ripe fruit, brought from the Cape, is ovate-oblong, about fifteen inches in length, and five in diameter, brown, each scale bearing two ovate, angular, orange-coloured drupas, about an inch long, their points directed towards the base of the scale. Nut not much smaller, ovate, angular.

2. *Z. pungens*. Needle *Zamia*. Linn. fil. MSS. Ait. Hort. Kew. ed. 1. v. 3. 478. ed. 2. n. 1. Willd. n. 2. Poir. n. 3. (*Palma fobolifera ægyptia*, foliis lævioribus, fructu nigro; Till. Pif. 129. t. 45.)—Leaflets awl-shaped, spreading, straight, rigid, pointed, entire; their outer margin rounded at the base; common stalk nearly cylindrical, unarmed.—Native of the Cape of Good Hope, from whence it was brought by Mr. Maffon, to Kew garden, in 1775, but has not yet flowered. The leaflets are very thick and coriaceous, much fewer than in the preceding species, mostly opposite, four or five inches long, and one broad; their under surface somewhat striated; the upper smooth and shining; margin quite entire; point simple, spinous, stout and rigid.

3. *Z. tridentata*. Three-toothed *Zamia*. Willd. n. 3.—Leaflets linear, obscurely furrowed, smooth, with three spinous teeth at the end; common stalk femicylindrical, channelled.—Supposed to be a native of the Cape of Good Hope. The leaflets are fourteen to sixteen pair, linear, tapering at each end, with two lanceolate, pointed, terminal teeth, and a third situated a little lower at the outer edge. Common stalk smooth. Willdenow. No other author appears to know this species. We have specimens in the herbarium of the younger Linnæus, without name, indication of their native country, or any traces of fructification, which answer

ZAMIA.

answer to the above characters; except the *leaflets* being more numerous, sometimes with a simple spinous point only, on the same stalk with others that have two or three, very rarely four; and in one instance the leafy part of the common *footstalk* is shaggy with soft hairs. Each *leaflet* is two, or two and a half inches long, thick-edged and slightly revolute, entire, except the above-mentioned points; smooth on both sides; furrowed beneath; tapering at the base, and somewhat decurrent at its insertion. See n. 15.

4. *Z. angustifolia*. Narrow-leaved Zamia. Jacq. Coll. v. 3. 263. Ic. Rar. t. 636. Willd. n. 4. Poir. n. 6.—Leaves linear, elongated, entire, obtuse, with two terminal callous points; common stalk femicylindrical. Fruit ovate, pointed.—Native of the Bahama islands; cultivated at Schoenbrun, where it was raised from seed, and bore flowers and fruit, the catkins being about eight months in going through their different stages. The *root* is scarcely bigger than a large radish; its ovate crown enveloped in a few pointed, very broad, scales. *Leaves* about a yard high, with slender stalks and *leaflets*; the latter drooping, a span long, and two lines broad. *Catkins* three inches long, on stalks about the same length; the male ones most slender, and nearly cylindrical. *Fruit* three inches long, of a thick ovate, or elliptical figure, with a blunt point. *Drupas* concealed, red.

5. *Z. tenuis*. Slender Zamia. Willd. n. 5.—“*Leaflets* linear, obtuse, somewhat revolute; tapering at the base; with one or two obsolete teeth near the extremity; common stalk triangular, smooth.”—Native of the Bahama islands. Willdenow saw a living male plant. *Leaflets* about fourteen pair; the upper ones furnished, near the point, with one or two very inconspicuous teeth. An intermediate species between the last and the following; agreeing nearly with *Z. angustifolia* in the form of its *leaflets*, but they are broader, and their *stalk* is triangular: the *leaflets* are narrower than those of the following, neither are they minutely ferrated towards the point; but the *stalks* are similar. Willdenow.

6. *Z. media*. Intermediate Zamia. Jacq. Hort. Schoenbr. v. 3. 77. t. 397, 398. Willd. n. 6. Poir. n. 7.—*Leaflets* linear-lanceolate, obtuse, flat; obscurely ferrated towards the point; common stalk triangular, smooth.—Native of the West Indies; cultivated at Schoenbrun. The crown of the *root* is as big as the fist. *Leaves* two feet long, besides their naked *stalk*, which is half as much. *Leaflets* from fourteen to twenty pair; five inches long, and one-third or half an inch broad, flat, for the most part entire, except a few shallow distant ferratures towards the extremity, which is bluntish, and without any spinous termination. *Female catkins* on short thick stalks, ovate, with a blunt point. *Fruit* oval, brown, rough, three inches long. *Jacquin*. That author considers the present species as allied, on the one hand, to his *angustifolia* (see n. 4.), and on the other to *integrifolia*, n. 8. Still we cannot question its being specifically distinct from both.

7. *Z. debilis*. Lax-leaved Zamia. Linn. fil. MSS. Ait. Hort. Kew. ed. 1. v. 3. 478. ed. 2. n. 2. Willd. n. 7.—*Palma prunifera humilis* non spinosa, insulæ Hispaniolæ, fructui jujubino similis, officulo triangulo; Commel. Hort. v. 1. 111. t. 58.—*Leaflets* lanceolate, acute, pointless, ferrated towards the point; common stalk triangular, smooth.—Native of the West Indies, from whence it is said to have been imported, in 1777, by the late Messrs. Kennedy and Lee. It flowers in the stove, in July and August. The *leaflets* are five or six pair, half an inch broad; though only two and a half or three inches long, and are distinguished from all the foregoing by their conspicuous ferratures, all

indeed near the end, the greater part of the *leaflet* being entire: the upper side is smooth and shining; under furrowed or striated. *Commelin* originally raised this species from seed in the Amsterdam garden, and was informed that the *fruit* was reddish, growing partly underground.

8. *Z. integrifolia*. Dwarf Zamia. Linn. fil. MSS. Ait. Hort. Kew. ed. 1. v. 3. 478. ed. 2. n. 3. Willd. n. 8. Pursh n. 1. Poir. n. 5, excluding the reference to *Commelin*. Jacq. Coll. v. 3. 261. Ic. Rar. t. 635. Lamarck t. 892, copied from *Jacquin*. (*Z. pumila*; Linn. Sp. Pl. 1659, excluding all the synonyms.)—*Leaflets* smooth, striated, lanceolate; rounded, obtuse, and finely serrated at the end; tapering at the base. Common stalk smooth, somewhat quadrangular.—Native of East Florida, from whence it was introduced into the English stoves, by the celebrated John Ellis, esq. in 1768. *Jacquin* says it grows also in Hispaniola. The crown of the *root* is sometimes as thick as a man's arm, dividing below into several stout branches and fibres. *Leaves* usually about eighteen inches long; sometimes twice as much. *Leaflets* from ten to twenty pair, opposite or alternate, each two and a half or three inches long, varying in breadth from one-quarter to three-fourths of an inch, entire, rather shining, strongly striated on both sides, with many parallel ribs; the extremity rounded and pointless, with a greater or less number of slight tooth-like ferratures in proportion to its width. *Catkins* on short stalks, ovate, clothed with dark brown pubescence; the male ones about two inches long. *Fruit* three inches long, elliptical, pointed, downy; its *scales* finally widely separating, each of them peltate and angular, supported by a rather slender angular stalk, above an inch in length, and remaining long after the fruit is fallen. Each *drupa* is elliptical, about half an inch, or more, in length, with a small quantity of sweet orange-coloured pulp, and a large, rather pointed, nut. The *leaflets* are too strongly ferrated in Lamarck's plate; and rather broader and more luxuriant than usual in *Jacquin's*, otherwise admirable, representation. The male *catkins* are very frequently produced; the female ones we know only from dried specimens, and the works of *Jacquin*.

9. *Z. muricata*. Prickly-stalked Zamia. Willd. n. 9.—“*Leaflets* oblong, pointed, smooth, striated; ferrated from the middle to the extremity; common stalk spinous.”—Gathered by Humboldt and Bonpland, in South America, near Porto Cabello. *Leaflets* about four pair, six inches long; tapering at the base; striated and ribbed on both sides; sharply ferrated in their upper half. *Footstalk* channelled, armed with very short, blunt, scattered spines. Willdenow.

10. *Z. furfuracea*. Broad Rusty-leaved Zamia. Linn. fil. MSS. Ait. Hort. Kew. ed. 1. v. 3. 477. ed. 2. n. 4. Willd. n. 10. Poir. n. 2. (*Palma americana, foliis polygonati brevioribus, leviter ferratis, et nonnihil spinosis, trunco crasso*; Pluk. Phyt. t. 103. f. 2. and t. 309. f. 5. *P. americana, crassis rigidisque foliis*; Herm. Parad. 210. t. 210. *Palmifolia fructu clavato polypereno*; Trew Ehret, 5. t. 26.)—*Leaflets* elliptic-oblong, pointless; copiously ferrated from the middle to the extremity; striated and hairy beneath; common stalk spinous.—Native of the West Indies. Plukenet saw it in the royal gardens at Hampton-Court in king William's time. It is still preserved in our stoves, flowering towards autumn. The crown of the *root* is often a foot in diameter. *Leaves* from one to two feet long, exclusive of their prickly stalks. *Leaflets* usually eight or nine pair, three or four inches long, and one or one and a quarter broad, very rigid and coriaceous; shining, and roughish to the touch, on the upper side; more

furrowed, and clothed with shaggy, chaffy pubescence, which gives them a rusty or tawny hue, underneath. Their ferratures, or teeth, are numerous, obtuse, very irregular. *Catkins* ovate, hoary and downy, about three inches long, on *stalks* about the same length. Hermann says this plant produces a white infusid gum.

11. *Z. spiralis*. Spiral Zamia. Salisb. Prodr. 401. Willd. n. 11. Ait. n. 5. Brown n. 1.—Leaflets numerous, linear, very smooth, somewhat curved, with a few spinous teeth at the extremity. *Catkins* smooth, with pointed scales; those of the male ones wedge-shaped.—Native of New South Wales, from whence seeds were sent, in 1791, by Dr. John White, to the writer of this, and plants were raised from them in the following year, by the late Mr. Fairbairn, in Chelsea garden, being the first introduction of this species into Europe. The whole cone, filled with these nuts, was about half as large as a man's head; the nuts themselves about the size of small chestnuts. They were said to be eaten roasted by the natives of New South Wales, but on being tried by our English settlers, occasioned sickness. Their flavour is certainly inferior to a chestnut, and even to the nuts of *Cycas revoluta*, ripened in the bishop of Winchester's stove at Farnham castle. The plants soon grew to a considerable size, and according to Mr. Aiton, this species flowers in the stove, in July and August. The leaves are very smooth, of a fine green, a yard or more in length, spreading, each composed of from thirty to forty pair of long narrow leaflets, tipped with from three to five spinous teeth. *Footstalks* said to be somewhat spiral. The *catkins* are stalked, cylindrical, about five inches long, and two in diameter, squariform, smooth, not downy nor hairy: *scales* of the male ones obovate-wedge-shaped, an inch long, with a short, broad, sharp, ascending, polished point; their upper side smooth and naked; under nearly covered with an uninterrupted heart-shaped assemblage of crowded, oval *anthers*, the size of poppy-seed: *scales* of the female *catkins* stalked, gibbous, two-edged and depressed, larger than the male ones, each tipped with an erect, sword-shaped, pungent, smooth point, an inch long, and, as the fruit ripens, extended to three inches, the gibbous fleshy part of the scale being then also much enlarged. *Germens* two, ovate, sessile, close together, at the inner edge of this fleshy part of the scale, and directed horizontally inward. *Drupas* roundish, gibbous, an inch or inch and a half in diameter, orange-coloured, with a rather thin pulp, at least in the dried state, and a large, ovate, hard nut, not bursting, whose kernel, after keeping twenty-five years, is horny, semitransparent, and as hard as the shell. Mr. Brown suspects there may be two species confounded under *Z. spiralis*; one found in the neighbourhood of Port Jackson, to which our description and synonyms entirely belong, and which is from two to four feet high; the other, often ten feet in height, noticed by Mr. Brown on the southern coast of New Holland, and which we have never seen. Mr. Brown remarks, that in both, the *catkins*, usually solitary, sometimes grow two together.

12. *Z. longifolia*. Tall-leaved Zamia. Jacq. Fragm. 28. t. 29. Willd. n. 12. Poir. n. 10.—Leaflets numerous, elliptic-lanceolate, pointless, entire, clothed with shaggy down. Scales of the male *catkins* wedge-shaped, with abrupt quadrangular points.—Native of southern Africa, above a hundred miles from the Cape of Good Hope. Cultivated at Schoenbrunn. The crown of the root is scaly, a foot in diameter, smooth. Leaves slightly spreading, from five to seven feet high; their *stalks* quadrangular, without spines; *leaflets* from forty to fifty or sixty pair, two-ranked, three or four inches long and one broad, coriaceous; striated beneath; clothed on both sides, as well as the leafy part of

their common stalk, with a cobweb-like down, easily rubbed off; the lower ones only somewhat pointed. This species has not flowered in Europe; but the male *catkin*, brought from Africa, and represented in Jacquin's magnificent plate, is elliptic-oblong, near two feet in length, and five inches in diameter, brown, smooth, composed of innumerable wedge-shaped scales, covered underneath with *anthers*, and each tipped with a quadrangular, or pyramidal, abrupt, prominent point, without any of the spinous termination seen in the last.

13. *Z. lanuginosa*. Woolly-scaled Zamia. Jacq. Fragm. 28. t. 30, 31. Willd. n. 13. Poir. n. 9.—Leaflets lanceolate, smooth, spinous-pointed, with a few unilateral spinous teeth. Radical scales woolly.—Native of southern Africa, from whence a single plant was brought long ago to the Imperial stove at Schoenbrunn. After twelve years' culture, it had made but slow progress, and shewed no signs of fructification. The root consists of numerous, very thick, tap-shaped radicles; its crown being as large as a man's head, and covered with imbricated, deltoid, pointed scales, two or three inches broad, all clothed with soft, dense, hoary wool. Leaves a yard high, or more, dark green, very smooth and shining, with unarmed quadrangular *stalks*, and from twenty-five to thirty pair of linear-lanceolate leaflets, each four inches long, with a short spinous point; their margins all entire, except being often furnished with one, two, or three broad, spinous, tooth-like lobes, always at the lower edge of each leaflet, by which this species is at first sight readily distinguished. Professor Willdenow suspected it might not be distinct from *Z. cycadis* (see our 15th species); but we see no reason to concur in that opinion.

14. *Z. horrida*. Grey Thorny Zamia. Jacq. Fragm. 27. t. 27, 28. Willd. n. 14. Ait. n. 6. Poir. n. 8.—Leaflets lanceolate, glaucous, acute, spinous-pointed, with a few unilateral, lanceolate, spinous teeth. Radical scales smooth.—Native of southern Africa, a hundred miles above the Cape of Good Hope. Cultivated at Schoenbrunn, and introduced into the English green-houses, in 1800, by John Lips-trap, Esq., who possessed, for several years, a splendid collection of exotics at Mile-end; but it does not seem to have blossomed either here or in Germany. The scaly crown of the root is as large as the preceding, but the scales are not woolly. The leaves and their stalks are all over finely glaucous, which distinguishes the plant from the rest of its genus. The leaflets, as well as their lateral spinous lobes, are longer, and more pointed, than in *Z. lanuginosa*; the points and bases green, as the whole surface becomes when rubbed. A ripe female cone, brought from its native country, is fifteen inches long and eight thick, brown, tessellated, and warty, but not spinous. *Drupas* orange-coloured, oval, each with a thick, elongated, obtuse point, in the place of the style. Nut oval, somewhat triangular. This species is, as Willdenow observes, very nearly related, in size and general habit, to the last, but differs in its smooth crown of the root, and glaucous colour of the herbage.

15. *Z. cycadis*. Bread-tree Zamia. Linn. Suppl. 443. Ait. n. 7. Poir. n. 4. (*Cycas caffra*; Thunb. Nov. Act. Upsal. v. 2. 284. t. 5.)—Leaflets lanceolate, spinous-pointed, smooth, entire; tapering at the base. Scales of the *catkins* abrupt, obtuse, pointless.—Native of the north-east part of southern Africa, far above the Cape of Good Hope, from whence living plants were sent to Kew, by Mr. Masson, in 1775. This is the species figured by Gertner. It grows on the sides of hills, in dry open spots, especially where the ground has been cleared by burning, and flowers in August, or the following months. The crown of the root is round and large, imbricated with scales, and, according to

Linnæus,

Linnæus, downy; with age, the plant acquires, like the palm tribe, a thick scaly stem, as tall as a man. The leaves are from a span to two feet long, of rather numerous and crowded leaflets, each two or two and a half inches in length, and one-quarter or one-third of an inch in breadth; smooth and even above; striated beneath; the younger ones, or rather those of young plants, tipped with a sharp tooth or two, besides the terminal spine. Common stalks smooth. *Catkins* stalked, ovate; the male a span long; its scales somewhat triangular, very obtuse, rugged, smooth; flat on the upper side; keeled underneath, and covered with anthers the size of millet-seed: female catkin larger than the male, near a foot long, green and smooth; its scales stalked, with a quadrangular, peltate, thick termination, lodging a pair of ovate angular drupes, with a red pulp. Nut of each the size of an acorn, not very hard, with a white solid kernel. Thunberg says, the older plants, which have acquired a stem, are broken off, or cut down, by the Caffres and Hottentots; and the pith, which is of considerable thickness, being tied up in the skin of a sheep or calf, previously well rubbed with grease, is buried in the ground. After remaining there a month, or longer, it is taken up in a putrefying state, and being bruised between two stones, and moistened with water, forms a sort of pult, which is made into little round cakes, about an inch in thickness. These are baked in wood-ashes, and are esteemed a great luxury; though, as the author observes, not very tempting to people of more refined habits, especially if they happen to have witnessed the whole process of preparation.

We are not without a suspicion that Willdenow's *Z. tridentata* (see n. 3.) may be this very species. This is more probable, at least, than his own conjecture, of Jacquin's *lanuginosa*, n. 13, being *Z. cycadis*.

Authors, even the most intelligent, use the term *frond*, instead of *leaf*; in their descriptions of this genus, because Linnæus considered *Zamia* as either a Palm, or a Fern. But its fructification is by no means cryptogamic, or obscure; nor do the leaves bear the flowers of either sex. There is a curious coincidence of structure and appearance between its anthers, and the supposed capsules of some of the spiked or racemose *Filices*, especially of *Botrychium* (the *Osmunda lunaria*, &c. of Linnæus); indeed the likeness is so great, that we can scarcely persuade ourselves that the two parts in question are not destined to answer the same purpose.

ZAMIA, in *Gardening*, comprises some low plants of the tender palm kind, among which the species chiefly cultivated in this climate are, the dwarf pinnated palm (*Z. pumila*), the thorny dwarf palm (*Z. spinosa*), and the entire leaved palm (*Z. integrifolia*).

The first is the finest sort, but the other two are occasionally preserved in some stove collections among other plants of the same class.

Method of Culture.—They may be raised from seeds, and by other means, in pots plunged in the bark-beds of hot-houses and stoves, where they must constantly be kept in light rich earth or mould, having the management of other exotics of similar kinds.

They afford variety in all such collections of tender plants.

ZAMIANSK, in *Geography*, a fort of Russia, on the Volga; 20 miles N.W. of Altrachan.

ZAMIN, a town of Grand Bucharia; 50 miles N.E. of Samarcand.—Also, a river of Asia, which rises about 70 miles S. of Kogend, and after a N.W. course of about 150 miles, loses itself in the earth.

ZAMIRÆ, in *Ancient Geography*, a people of India that were Anthropophagi, near mount Mœander. Ptol.

ZAMOLXIS, in *Biography*, a celebrated person among the Scythians, was, as some have supposed, a slave of Pythagoras, who, having attended him into Egypt, obtained his freedom, and taught his master's doctrine among the Getæ. It has been also said, that in order to enforce the belief of the immortality of the soul, he dug a subterranean apartment, and concealed himself in it for three years; but re-appearing as one risen from the dead, he there established his authority as a teacher. But Herodotus, who relates this fabulous story, as a common tradition, gives it no credit, but expressly says, that so far from being a Pythagorean, he flourished at a much earlier period than Pythagoras. The general testimony of the ancients furnishes reason for concluding, that Zamolxis was a Thracian, who, at a very remote period, taught the Scythians the doctrine of the immortality of the soul, and that after his death, they enrolled his name among the divinities, with whom they assured themselves they should associate in the invisible world. Herodotus relates, that at certain festivals, they chose several persons by lot, who were to be deputed as messengers to Zamolxis; and that they put them to death, by throwing them up into the air, and catching them, as they fell, upon the points of their spears; and this story is thought to be the more credible, because it is well known, that the practice of offering human sacrifices prevailed among the Scythians and the Thracians. Herodotus. Brucker by Enfield, vol. i.

ZAMORA, in *Geography*, a town of Spain, in the province of Leon, on the Duero; the see of a bishop, suffragan of Compostella. In the year 967, this town was taken by the Moors and destroyed; but afterwards rebuilt and fortified. It is now a frontier town against Portugal, and place of arms. The streets are narrow, and the general appearance of the town is gloomy; 120 miles N.W. of Madrid. N. lat. 41° 50'. W. long. 6°.—Also, a town of Algiers, founded in honour of a Mahometan saint. Here is a small garrison; 28 miles W. of Seteef.—Also, a town of Mexico, in the province of Guadalupe; 80 miles N.W. of Mechoacan. N. lat. 20° 54'. W. long. 103° 40'.—Also, a town of South America, in the audience of Quito, on a river of the Amazons. In the neighbourhood are some gold-mines; 200 miles S. of Quito. S. lat. 4°. W. long. 78° 46'.

ZAMOSCIE, or *SAMOSTZIC*, a town and fortrefs of Aultrian Poland, in Galicia, built by the famous great chancellor, John Zamoyfki. It has a stately cathedral, and several other churches, a decayed university, a charitable foundation called Mons Pietatis, and several valuable privileges; but the fortifications are now in a bad condition. The proprietor of this town, &c. filled himself prince Zamoscie. It now belongs to Aultria; 60 miles N.W. of Lemberg. N. lat. 50° 31'. E. long. 23° 15'.

ZAMPALA, a river of Mexico, which rises in the province of Tlafcala, and runs into the gulf of Mexico, N. lat. 19° 40'.

ZAMPALA, *Chempoalla*, or *Zempoala*, a city of Mexico. When Cortez landed in the year 1519, the chief or lord of this place, who was tributary to Montezuma, offered his service to the Spaniards. It was at that time a large city and exceedingly populous, the lowest account reckoning the inhabitants at 20,000 or 30,000. It was the capital of a country called Totonacapan, now the N.E. part of the province of Tlafcala; 90 miles E. of Puebla de los Angeles. N. lat. 20° 10'. W. long. 97° 50'.

ZAMPERINI, ANNA, in *Biography*, of Venice, arrived in England in 1767, as a buffa singer, a *partie eguale*, with the

the Guadagni, sister to the great singer and actor Guadagni, who had been here in early youth.

The Zamperini was a very pretty woman, coquetish, and an affected singer. Her first appearance on our stage was in *La buona figliuola* Maritata di Piccini, of which the music was so difficult to perform, and not easy to hear, that it was never sufficiently repeated for the public to be familiarly acquainted with it. They were glad, therefore, as well as the performers, to return to *La buona figliuola*, for their own relief from a too serious attention.

The sister of Guadagni, an elegant singer, and graceful actress, the original performer of the part of *Cocchina* in Italy, being superseded in that part by the Zamperini, occasioned a great rupture between Guadagni just arrived here in 1769 for the second time, and the honourable patentee and impresario of the opera; which generated faction and a party spirit that destroyed the comfort of the opera, serious and comic, at a time when the public, in a state of tranquillity, would have been more delighted than at any other period.

We never heard the Zamperini sing serious music, but are told by M. Laborde (*Essai sur la Mus.*), that "having a natural talent for music, and great spirit and fire in her action, though her excellence of performance was principally manifested in comic operas, yet she sung equally well in the serious. After performing with great applause in London, Lisbon, and Italy, she quitted the stage, and was well married."

ZAMPERI, DOMENICO, called *Domenichino* in the History of Painting, was born at Bologna, in 1581, and placed when very young under the tuition of Denis Calvert; but being ill treated by him, he prevailed upon his father to permit him to enter the school of the Carracci, at the time when Guido and Albano were both students there. He soon distinguished himself, but more by his care and assiduity than by brilliancy of talent. He here attached himself to Albano, and, when he left the Carracci, they travelled together to Parma, Modena, and Reggio, to study the works of Correggio and Parmeggiano, and soon afterwards they both went to Rome. In that city his first patron was cardinal Agucchi, who employed him in his palace, and commissioned him to paint three pictures for the church of S. Onofria, of subjects from the life of S. Jerome. His former master, An. Carracci, also employed him for some time to assist in his great work at the Farnese gallery; and he painted from his own designs, in the loggia in the garden, the Death of Adonis, when Venus springs from her car to assist her unfortunate lover.

As the health of A. Carracci became rapidly impaired, and he was necessitated to refuse many commissions offered to him, he recommended them to his scholars; and had the satisfaction of seeing Guido and Domenichino employed by the cardinal Borghese to paint the frescoes in S. Gregorio, which have subsequently become so celebrated, and of which the Flagellation of S. Andrea by the latter is so justly admired. The cardinal Farnese also employed him to paint some frescoes in the chapel of the abbey at Grotto Ferrata; among them is that picture of the Cure of the Demoniac Youth, which has been compared with and by many preferred to the one of Raphael in the Transfiguration. Another cardinal, Aldrobrandini, availed himself of the established renown of Domenichino, and engaged him to paint in fresco ten pictures of the history of Apollo, in his villa at Frascati, which added greatly to his reputation. Soon afterwards he completed the work which more than any other has served to immortalize his name, his well-known picture of the Communion of S. Jerome, painted

for the principal altar of the church of S. Girolamo della Carità. This fine production ranks with the best of any age. It is said with great semblance of truth, that the arrangement of its composition was borrowed of Agostino Carracci, who painted the same subject for the Certosi at Bologna. But if Domenichino did borrow the thought, he has amply made amends by the mode in which he has adorned it. It received its due meed of applause at the time, and was ranked as the work next in value to the Transfiguration by Raphael; but while the merit of its author thus excited the admiration of the public and most of the artists of Rome, it elicited in the minds of several, and among them of Lanfranco, the bitterest spirit of envy and malignity, which was actively exerted against him. He was reviled as a plagiarist, and the execution of his pictures condemned as heavy and ungraceful; and in spite of their powerful effect, the influence of his adversaries so far prevailed, that for a time he failed of commissions, and had serious thoughts of changing his profession for that of sculpture. The celerity and freedom with which Lanfranco invented and painted, and all those machinists who applauded the means of art above the end, were opposed to the slow and uncertain power of invention possessed by Domenichino. But upon this subject Lanzi justly observes, that if Domenichino had had the good fortune which he merited, he would, like the Carracci in Bologna, have soon triumphed over his adversaries, admitting that he was an imitator, but not a servile one, and that if his works were more slow in their birth than those of his enemies, they merited a much longer existence. "The public," he adds, "is just in its judgment, but before its tribunal a good cause is not sufficient of itself unless able pleaders give it credit. Domenichino timid and solitary, master of little, had not then sufficient means to protect himself against the torrent which overwhelmed him, and report seemed to verify the remark of the cardinal Agrecchi, that his worth would not be duly appreciated till after his death. Impartial posterity does him justice, and there is now no gallery which is regarded as complete without some specimen of his talents."

The virulence of these persecutions disgusted and disturbed Domenichino so much, that he returned to Bologna, and there he tranquilly passed some years in the delightful practice of his art. Among the most renowned of his productions about this period are his pictures of the Martyrdom of S. Agnes, for the church of that saint, and the Madonna della Rosario, both large works, and of sufficient merit to attract the insipidity of the French, and for a while they adorned the walls of the Louvre; but they are now returned to their original destinations. When malice and envy had exhausted themselves, and fame added fresh laurels to the brow of Domenichino, he was invited back to Rome by pope Gregory XV., who appointed him his principal painter, and architect to the pontifical palace. The cardinal Montotto engaged him to paint the vault of S. Andrea della Valle, where he represented the four Evangelists with Angels; and in the chapel of cardinal Bandini, in the church of S. Sylvestro, in the Quirinal, he painted four pictures, which rank amongst his best: the subjects are, Either before Abaferus, Judith with the Head of Holofernes, David playing and singing before the Ark, and Solomon and his Mother Bathsheba seated on a Throne. The former are certainly of a very high class of art, and though lacking the simplicity and grandeur of M. Angelo or Raffaele, yet they are full of rich and fine forms, particularly those of the angels, &c. which accompany the figures. The latter are not of so elevated a style, but are more familiar, and wrought with fine colour: they are engraved by Jacomo Frey.

Frey. About the same time he painted four of the Cardinal Virtues in the angles of S. Carlo Catenari, which have been preferred to us by the graver of G. Andran.

Domenichino not only excelled in historical painting, in works both great and small, but he has also left us many landscapes of extraordinary excellence in point of tone; feldom can fo much be faid of their compositions. They are generally felekt in feenery, of a grave and dignified character, and are executed with boldnefs and freedom, and enriched with figures. A very fine one may be feen in the collection of the marquis of Stafford. He is univerfally efteemed as the beft among the difciples of the Carracci, and Nicolo Pouffin is faid to have preferred him before them; but that favour, if we except the Communion of S. Jerome, his works will fearcely be found to fupport. M. Fufeli has remarked, that "expreffion which had languifhed after the death of Raphael feemed to revive in Domenichino; but his fenfibility was not fupported by equal comprehension, elevation of mind, or dignity of motive." His forms are by no means fo pure or graceful, or his actions fo natural and unconftained, as thofe of that divine painter. His invention does not appear to have been vivid, but his ftudy was unremitting, and with all his defects he well deferved the title of a great painter, and certainly has not fince been equalled. He died in 1641, aged 60.

ZAMPOGNA, in the *Italian Mufic*, is ufed to denote any inftrument that founds like a flute; and particularly a bagpipe, being an affemblage of divers pipes of different fizes. It is alfo taken for a common flute.

ZAMRECOTTA, in *Geography*, a town of Boptan; 34 miles S.E. of Damfong.

ZAMZEVRIZI, a town of the principality of Georgia, in the province of Carduel; 15 miles S.W. of Gori.

ZANA, a river of Peru, which runs into the Pacific ocean, S. lat. 7°.

ZANAATHA, in *Ancient Geography*, a town in the interior of Arabia Petraea. Ptol.

ZANCHI, BASILIO, in *Biography*, an elegant Latin poet, was born at Bergamo in 1501, and purfued his ftudies under Giovia Rapicio with fo much ardour, that at the age of feventeen he made a collection of Latin poetical epithets, which was afterwards publifhed. Before he had attained the age of twenty he vifited Rome, and was much noticed by the poets of that city. According to the practice which then prevailed he changed his baptifmal name Pietro into L. Petreius; but afterwards, returning to Bergamo, and entering, in 1524, among the canons-regular of Lateran, he affumed that of Bafil; devoting his attention to facred literature, and publifhing fome works on the fcriptures. In the progrefs of his life he frequently changed his refidence; and was every where refpected, on account of his learning and talents, by the principal fcholars of the age. Under the fevere decree of pope Paul IV. iffued in 1558, which commanded, under the threatened penalty of the prifon or galleys, all the religious to return to the cloifters to which they belonged, Zanchi was imprifoned, and fell a facrifice to the rigour of confinement. One of his biographers fays, that he had few equals in the fweetnefs, and fewer in the elegance of his poetry; fpecimens of which occur in his eight books of poems, one of which bears the title of "De Horto Sophiz;" and defcribes the moft remarkable facts and doctrines of the Catholic religion. Some of his poems are inferted in the "Deliciae," and the "Carmina Poetarum Italarum." He alfo publifhed a kind of Lexicon, entitled "Latinorum Verborum ex variis auctoribus Epitome." Moreri. Gen. Biog.

ZANCHI, GIROLAMO, an Italian Proteftant, was born in

1516 at Alzano, in the territory of Bergamo, and entered among the canons-regular of Lateran at the age of fifteen, in which connection he remained for ten years. But Peter Martyr having communicated to him, and others of his fraternity, the opinions of the reformers, he departed with him from Italy in 1530, and went to Geneva. From Geneva he removed to Strafburg upon an invitation to fupply a vacancy in the profeforfhop of facred literature, which he accepted in 1553, and which he occupied for about eleven years. Having figned the Augfburg confeffion, with fome reftriktions, he was aggregated to the chapter of St. Thomas, in Strafburg. Although his difpofition was moderate and conciliatory, he was engaged in fome difputes with the zealous Lutherans, who determined to procure his expulfion. With this view, they acquired his fignature of a formulary, to which he affented in the following terms: "Hanc doctriinz formulam ut piam agnofco, etiam recipio." The ambiguity of this declaration was not fatisfactory to his adverfaries, and he was therefore induced to refign, and to accept an invitation to a church in Chiavenna. The articles with regard to which he was fufpected by the Lutherans were predelination, the perfeverance of the faints, the eucharift, ubiquity, images, antichrift, and the end of the world. Having refided at Chiavenna from the year 1563 to 1568, he removed to the theological chair at Heidelberg, when he took the degree of doctör. When Frederick III., who was a zealous Lutheran, fucceeded the electör palatine, and removed the Heidelberg profefors, Zanchi declining offered fettlements at Leyden and Antwerp, took a place in count John Cafimir's college at Newftadt. Upon the reftoration of the expelled profefors, Zanchi, on account of his age, was declared "emeritus;" and having loft his fight, died at Heidelberg in 1590.

Highly efteemed among Proteftants in general on account of his learning and invincible attachment to their principles, John Sturmius affirmed of him, "that he fhould not be at all anxious for the caufe of reformed religion, if Zanchius alone were to difpute in the council of Trent againft all the fathers prefent." Bayle.

ZANCLE, in *Ancient Geography*, a town of Sicily, on the ftrait which feparates this ifland from Italy. According to Herodotus, the Melfenians, driven from the Peloponnefus by the Lacedaemonians, tranfplanted themfelves into Sicily, took poffeffion of Zancle, and gave it the name of Melfana, whence Melfina.

ZANDENDORF, in *Geography*, a town of Germany, in the margravate of Anfpach; 2 miles S.W. of Cadolzburg. ZANDHOP, a town of Pruffia, in Ermeland; 16 miles S.E. of Heilsberg.

ZANE, a town of Virginia; 9 miles S.S.E. of Winchester.—Alfo, a townfhip of Champaign county, in the diftrikt of Ohio, with 645 inhabitants.

ZANES, in *Ancient Geography*, a town of Upper Mæfia, fortified by Julinian, fo as to render it one of the ftrongeft bulwarks of the empire.

ZANESVILLE, in *Geography*, a townfhip of the ftate of Ohio, in the county of Mufkingum, on the Scioto, with 2154 inhabitants.

ZANETTI, ANTONIO, in *Biography*, of Venice, maeftro di capella to the duke of Modena, the latter end of the 17th and beginning of the 18th century, for whom, and for the theatres in Venice, he produced fix or feven operas that were much efteemed in thofe days.

ZANETTI, FRANCISCO, was born in the year 1740, maeftro di capella in the cathedral at Perugia in 1770. He had previously paffed fome time in London, where fome elegant and eafy fonatas of his compofition were publifhed

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by Bremner. He lost his place in the church at Perugia, by having appeared on the Alberti stage at Rome, as a singer in an opera of his own composition, and that, merely to supply the place of the principal tenor, who had run away, and to prevent the piece from being stopped: he however married afterwards a pretty woman, who sung well, and indemnified him for the loss of his place.

Since his marriage he has composed several successful operas, in which signora Zanetti has performed the principal female part, particularly one at Milan in 1785, in which she was much applauded, as well as her husband's music. He has composed much natural and pleasing music for instruments; as six violin trios, six quintets for three violins, and two violoncellos, &c.

ZANFARA, in *Geography*. See ZAMFARA.

ZANGARISA, a town of Naples, in Calabria Ultra; 6 miles N.E. of St. Severina.

ZANGESAIR, or SANGUSEER, a sea-port of Hindoostan, in Concan, with a good harbour, but not much frequented; 15 miles S. of Severndroog. N. lat. $17^{\circ} 38'$. E. long. $72^{\circ} 54'$.

ZANGUEBAR, a name given to a large territory of Africa, bordering on the Eastern sea, including many kingdoms; the name is said to import "the coast of the negroes," all the inhabitants being blacks, with curled woolly hair; extending from two degrees north to the twenty-first degree of south latitude. The principal kingdoms on the coast have been separately spoken of and described. Of the country in general little is known; the whole tract is represented as barren and unhealthy, the lands lying low, and intersected with rivers, lakes, thick woods, forests, and marshy grounds. The fruits of it are very unwholesome, their rivers, for the most part, covered or choked up with weeds, bushes, and thickets; all which so stagnate the air, and corrupt the products of the earth, and render the inhabitants so sickly and indolent, that they receive little or no benefit from its produce. The Bedouin Arabs are the only people who make advantage of it by breeding multitudes of cattle, and living mostly upon their flesh and milk; whilst the negroes, or Zanges, content themselves with feeding upon wild beasts and fowl, which swarm all over those parts. To supply the want of corn, pulse, roots, and other wholesome food, of which they are destitute, the Divine Providence hath interspersed that whole country with mines of gold, easily got, by the help of which they can purchase all the necessaries and conveniences of life from other parts: but this is the very circumstance that makes them so extremely jealous of letting strangers penetrate into the inland; more especially since the Portuguese have made themselves masters of such a number of places along this coast. They are in their nature fierce and stout, ignorant and brutish, without religion, especially the negroes; upon which last account they have the name of Caffers. As for the Bedouins, they have some kind of religion, or rather observe a variety of superstitious rites, but are no less ignorant and uncivilized than the Caffers; yet they chiefly herd among themselves, and live at a great distance from the coasts, and by the sides of lakes and rivers, for the convenience of pasture for their numerous herds. They go all naked, both Caffers and Arabs, excepting that they wrap a piece of cotton cloth round their middle, which descends a little below the knee; but those who live along the coasts are somewhat more civilized, affect a little more finery in their dresses, and instead of cotton cloth cover themselves with the skins of wild beasts, more or less rich, according to their rank, with

the tails of animals trailing behind on the ground; they likewise adorn their necks, arms, and legs, with a variety of beads, bugles, and other trinkets, of amber, jett, glass, and other materials, which they purchase from the merchants with their gold, furs, ivory, and other commodities. There are among these coasts a great number of Mahometans, but a much greater number still among the islanders along the coast; they being for the most part descended from those Arabs who were banished out of their country. The countries are, Melinda, Mongala, Jubo, Mofambique, and some others.

ZANHAGA, or ZANZAGA, or *Zenhaga*, a province of Africa, in the country of Sahara, bordering on the Atlantic.

ZANIA, in *Ancient Geography*, a town of Asia, in the interior of Media. Ptol.

ZANNA, the name of a medicinal earth, described by Oribasius: he says it is found in Armenia, in that part which borders on Cappadocia; and that it is very drying, and of a pale colour, and easily diffused by water, falling into a fine powder like lime.

It is called by the natives *zarina*, and the mountain from which it is taken is near the city Baganona. It is of a drying and astringent nature.

ZANNICHELLI, JOHN JEROME, in *Biography*, a physician and naturalist, was born at Modena in 1662, and settling in the medical department at Venice, he published a work on the preparation of chemical medicines, entitled "Promptuarium Remediorum chymicorum." In 1702 he was created, by a patent of the duke of Parma, doctor of medicine, surgery, and chemistry. He afterwards formed a museum of natural history, and made many journeys in order to collect fossils and other subjects for this repository. Some of his excursions were undertaken by public authority, as he was nominated by the chamber of health, physician-naturalist to all the states of Venice. He died in 1729. During his life-time he published several tracts relating to botany and lithology; and after his death his son John James edited from his MSS. "Opuscula Botanica Posthuma," 1730, and "Istoria della Pianta che nascono nel lidi intorno a Venezia," 1735, being a description, with figures, of the plants on the Venetian shores. Haller. Eloy.

ZANNICHELLIA, in *Botany*, was so named by Micheli, in compliment to John Jerome Zannichelli, an eminent apothecary at Venice, who spared no expence or labour, even at an advanced age, in the study of botany, on account of which he undertook several hazardous and difficult journeys. He was particularly devoted to the observation of marine productions, as well animal as vegetable. In pursuit of these he was Micheli's companion and guide, among the islands and shores of the Adriatic; and has wrote an account of the plants there to be found; which, with the history of some of his mountain tours, were printed after his decease. Zannichelli published a pamphlet on the medical qualities of *Rufcus*, as well as various chemical and geological works. He died in 1729, aged 67. His son, John Jacob Zannichelli, wrote on the properties of the horse-chestnut, as well as an account of his own and his father's museum. — Mich. Nov. Gen. 70. t. 34. Linn. Gen. 476. Schreb. 616. Willd. Sp. Pl. v. 4. 181. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 229. Sm. Fl. Brit. 955. Prodr. Fl. Græc. Sibth. v. 2. 225. Pursh 4. Juss. 19. Poiret in Lamarck Dict. v. 8. 836. Lamarck Illustr. t. 741. Gærtn. t. 19. (Graminisolia; Dill. Gen. 168.) — Class and order, *Monococia Monandria*. Nat. Ord. *Inundata*, Linn. *Naiades*, Juss.

Gen. Ch. Male, *Cal.* none. *Cor.* none. *Stam.* Filament one, simple, elongated, erect; anther ovate-oblong, erect.

Female, close to the male. *Cal.* Perianth of one leaf, inferior, hollow, swelling, oblique, with two or three teeth. *Cor.* none. *Pist.* Germens from four to eight, stalked, oblong, converging; styles as many, simple, rather spreading; stigmas ovate, peltate, flat, spreading outwards. *Peric.* none. *Seeds* as many as the germens, naked, stalked, oblong, compressed, a little incurved, beaked with the permanent styles, tuberculated at the back, with a simple coriaceous coat.

Obf. Schreber speaks of some solitary, dispersed, male flowers, furnished with a single-leaved calyx, whose orifice is oblique, acute at the posterior part, and entire. He follows Gærtner in considering the coat of each seed as a capsule; but the latter allows there is scarcely any internal coat, or integument, to the kernel, and the outer one is destitute of valves; so that although the style be permanent, we rather follow Linnæus than other authors; and we conceive that if the existence of a naked seed be admitted in any instance, it must be in the present; there being only a simple covering to the embryo, which is indispensible.

Eff. Ch. Male, Calyx none. Corolla none. Filament elongated, erect. Anther oblong.

Female, Calyx of one leaf. Corolla none. Germens four, or more. Stigmas peltate. Seeds stalked, naked.

1. *Z. palustris.* Marsh Horned-Pondweed. Linn. Sp. Pl. 1375. Willd. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 1844. Pursh n. 1. Mill. Illustr. t. 77. Fl. Dan. t. 67. (*Z. palustris* major, foliis gramineis acutis, flore cum apice quadricapulari, embryonis clypeolis integris, et vasculo non barbato, capsulis seminum ad costam dentatis; Mich. n. 1. t. 34. f. 1. Potamogeto filimis, graminifolia, ramosa, ad genicula polyceratos; Pluk. t. 102. f. 7.)—Anther of four cells. Stigmas entire.—Native of ponds, ditches, and rivulets, in Italy, as well as other parts of Europe, from Sweden to Constantinople, flowering in summer. It is found also in Virginia, near the sweet springs, according to Clayton and Pursh. The root is annual. Stem slender, floating, branched, round, leafy, and smooth, with the habit of a *Potamogeton*. Leaves linear, grassy, sessile, narrow, acute, and entire, two or three inches long. *Braſtea* membranous, tubular, axillary, including a pair of green flowers, one male, the other female. Anther tawny. Seeds blackish when ripe, rugged or toothed at the back.

2. *Z. dentata.* Toothed Horned-Pondweed. Willd. n. 2. Poir. n. 2. (*Z. palustris* minor, foliis gramineis acutifimis, flore minimo cum apice bicapulari, embryonis clypeolis circumcrenatis, et vasculo barbato, capsulis seminum ad costam asperis; Mich. n. 2. t. 34. f. 2.)—Anther of two cells. Stigmas toothed.—Found in the neighbourhood of Florence, with the foregoing, as well as in mountain pools in the adjacent country. Rather smaller than the first species, with shorter leaves; but most essentially different in having only two cells to the anther, and remarkably toothed stigmas. The seeds also are tuberculated all over, not merely toothed at the back, or keel.

Loureiro has a *Z. tuberosa*, Fl. Cochinch. 543, to which he attributes "ovate-oblong single-seeded berries." It grows in the waters of Cochinchina, and has tuberous perennial roots, radical, sword-shaped leaves, spiked flowers, the calyx of the female in six deep segments. We agree with M. Poir. that it would be too hazardous to admit this species without examination. Loureiro had probably never seen a real *Zannichellia*.

ZANOE, in *Ancient Geography*, a town of Palestine, in Vol. XXXIX.

the mountains of the tribe of Judea.—Also, a town of Palestine, in the plain of the tribe of Judea. Jofhua.

ZANONA, in *Geography*, a small island in the Mediterranean; 2 miles N.E. of Ponza.

ZANONIA, in *Botany*, bears that name in memory of an Italian botanical writer of the 17th century, James Zanoni, superintendent of the public garden at Bologna. He published in 1675 a folio volume, in Italian, entitled *Istoria Botanica*, with 80 plates, of new or rare plants, accompanied by descriptions. Monti gave an enlarged edition of this work, in Latin, in 1742. Zanoni died in 1682, aged 67. Plumier, who speaks of him as a learned and critical investigator of the plants of the ancients, published a *Zanonia*, in his Nov. Gen. 38. t. 38, which Linnæus has reduced to *COMMELINA* (see that article, sp. 12.); and which some botanists reckon a *Tradesantia*.—Linn. Gen. 523. Schreb. 690. Willd. Sp. Pl. v. 4. 769. Mart. Mill. Dict. v. 4. Jusf. 397. Poir. in Lamarck Dict. v. 8. 837. Lamarck Illustr. t. 816.—Class and order, *Dioecia Pentandria*. Nat. Ord. *Cucurbitaceæ*, Linn. Julf.

Gen. Ch. Male, *Cal.* Perianth of three ovate spreading leaves, shorter than the corolla. *Cor.* of one petal, in five deep, spreading; pointed, inflexed, equal segments. *Stam.* Filaments five, spreading, the length of the calyx; anthers simple.

Female, on a separate plant, *Cal.* Perianth as in the male; seated on the germen, deciduous. *Cor.* as in the male. *Pist.* Germen oblong-clubshaped, inferior; styles three, spreading, conical, reflexed, permanent; stigmas divided, crisped. *Peric.* Berry large, elongated, abrupt; tapering at the base; encompassed near the top with a crisped future, of three cells. *Seeds* two in each cell, rounded-oblong, flat, in the centre of a lanceolate scale, or wing.

Eff. Ch. Male, Calyx of three leaves. Corolla in five deep segments.

Female, Calyx superior, of three leaves. Corolla in five deep segments. Styles three. Berry of three cells, with a lid. Seeds winged, two in each cell.

1. *Z. indica.* Climbing Indian Cucumber. Linn. Sp. Pl. 1457. Willd. n. 1. Poir. n. 1. ("Penar-valli; Rheede Hort. Mal. v. 8. t. 49, male; t. 47, 48, female.")—Native of Malabar and Ceylon. A stranger in the gardens of Europe, nor do we recollect having ever seen a specimen, Linnæus having, in this instance, confided entirely in the *Hortus Malabaricus*, which was very rarely his custom. The herbaceous branching stem appears to climb by means of simple, spiral, axillary tendrils. Leaves alternate, stalked, ovate-oblong, acute, entire, smooth. Flowers in lax drooping clusters, which in the male appear to be somewhat compound. Fruit oblong, abrupt, obscurely triangular, with the flavour of a cucumber according to Rheede. There can be little doubt of this genus belonging to the gourd tribe, whether it answers to all the characters which authors have been pleased to apply to that tribe or not. The opening of the fruit betrays some analogy to *Momordica operculata*.

ZANORI, in *Geography*, a town of Mexico, in the province of Culiacan; 80 miles N. of Culiacan. N. lat. 25° 40'. W. long. 108° 10'.

ZANOTTI, FRANCIS MARIA, in *Biography*, a mathematician and philosopher, was born at Bologna in 1692, began his education among the Jesuits, and pursued a course of natural philosophy at the place of his nativity. Declining the prosecution of jurisprudence, to which he directed his first attention, he devoted himself to the study of philosophy, laying the foundation in an acquaintance with mathematics, and commencing with the works of Descartes

and Malebranche. But being desirous of studying the works of Aristotle and Plato in the original language, he applied with diligence to acquire a knowledge of the Greek, so that he became able not only to read but to write it. Thus furnished, he obtained leave to give lectures in philosophy; in the course of which he instituted a comparison between the system of Descartes and that of Newton, avowing a decided preference to the latter; more particularly as it respects optics and astronomy. It was by his advice, and under his direction, that Algarotti undertook to compose a popular treatise on light and colours. Declining to go to Padua for the purpose of giving lectures, he was appointed librarian to the Institute at his native place, and afterwards secretary, in which office he drew up in Latin an account of the transactions of the academy, with a history of its institutions, which he continued till the year 1766. This work was rendered peculiarly pleasing and instructive by the clearness of his arrangement, and the excellence of his style; in both which respects he seems to have formed himself on the model of Fontenelle. To these transactions he was himself a contributor; communicating a method of squaring different spaces of the hyperbola, and several important discoveries with regard to the circle, sphere, and circumscribing figures. Of these discoveries he transmitted an account to the Academy of Sciences at Montpellier, of which, as well as of the Royal Society of London, he had been elected a member. He also discovered a method of separating indeterminate quantities, detected several errors in philosophy, and prosecuted a variety of experiments; on these and other subjects he delivered papers to the Bologna Institute, which were published in his commentaries. Several of his papers on the central forces were also inserted in the Transactions of the Academy. His theorem on the means of determining the velocity of a body drawn or repelled from its centre, in any point of its orbit, were held in high estimation by Paul Frisius, who availed himself of it in the composition of his work on universal gravity. On the subject of the "Vis viva," which in his time engaged particular attention, he wrote three dialogues in Italian, distinguished for perspicuity and elegance. In these he adopted the opinion of Descartes in opposition to that of Leibnitz, who conceived that this force was not to be estimated from the velocity, as he asserted, but from the square of the velocity. The properties of numbers likewise engaged his peculiar attention; and he shewed, that if any multiple of the number 9 be taken, the sum of the figures forming that multiple will be also a multiple of 9. In his speculations on moral philosophy, he defended the Peripatetics against Maupertuis; and his adversary Analdi, in his "Vindicie Maupertusianæ," accused him of depreciating the Catholic religion, as he ascribed too great influence to the Stoic philosophy in alleviating the misfortunes of human life. This controversy gave occasion to many publications. Zanotti was a poet as well as a mathematician and philosopher, and wrote verses both in the Tuscan and Latin languages; aiming, in imitation of the most celebrated poets of Italy, to blend the suavity of Petrarch with the energy and vigour of Dante. Many of his Italian poems were published by Eustazio Manfredi; and some of his Latin elegies were edited by J. Antonio Vulpi; who says of them, that Catullus himself would not have been ashamed to acknowledge them. Both his Italian and Latin poems were afterwards published separately, first at Florence, and lastly at Bologna; and in this edition are contained imitations of Tibullus, Ovid, and Virgil, as well as of Catullus. After the death of Beccaria, Zanotti, whose modesty was no less conspicuous than his talents and acquirements, accepted the office of president of

the Institute, which he deemed peculiarly honourable, as it was a token of esteem conferred upon him by his countrymen. Among the learned men with whom he maintained intercourse of friendship or correspondence were the famous anatomist Morgagni, Voltaire, and pope Benedict XIV. He died in the month of January 1777. For an account of his works, which, besides those to which we have already referred, were numerous, we refer to "Fabroni Vita Italorum Doctrina excellentium;" and for an abstract of their titles, and time and place of publication, to Gen. Biog.

ZANOTTI, GIOVANNI PIETRO, was born at Paris, though of Italian parentage, in 1674. He was sent young to Bologna, and became a pupil of Lorenzo Pallinelli. Under that master he acquired an agreeable tone of colouring, a mellow pencil, and an intelligent acquaintance with the principle of the chiaro oscuro. He painted several altar-pieces for the churches at Bologna, of which the most esteemed are, the Incredulity of St. Thomas, in the church of S. Tommaso del Mercato; the Resurrection, in S. Pietro; the Nativity, in La Purita; and a large picture in the palazzo publico, representing the ambassadors from Rome swearing fidelity to the Bolognese. He resided great part of his life at Cortona, where he also distinguished himself by several pictures painted for the churches, particularly Christ appearing to the Magdalen, Christ bearing his Cross, and the Murder of the Innocents.

Zanotti was a laborious and intelligent writer on art. Of his numerous publications the most considerable is his "Storia dell' Accademia Clementina di Bologna," published in two vols. 4to. in 1739. He died in 1765, aged 91. Bryant's Dict.

ZANOTTI, L'ABATE GIANCALISTO, of Bologna, a disciple of Padre Martini, was born in 1770, of whose composition at the annual performance of the musical students, who were members of the celebrated Philharmonic Society in Bologna, founded in 1666, we heard a *dixit*, in which there were all the marks of an original and cultivated genius. The movements and even passages were well contrasted; and to make use of the language of painters, there were discernible in it not only light and shade, but even mezzo tints. He proceeded from one thing to another by such easy and insensible gradations, that it seemed wholly the work of nature, though conducted with the greatest art. The accompaniments were judicious, the ritornels always expressed something, the melody was new and full of taste, and the whole was put together with great judgment, and even learning. We have very seldom been more pleased or completely satisfied than by this production; and yet the vocal parts were but indifferently executed, for there were then no great singers at Bologna. We expected to have heard of finer works by this most promising young composer, who was one of the *maestri di capella* in the church of San Petronio; but as that has not happened, we fear he did not long survive this performance.

ZANOW, in *Geography*, a town of Pomerania; 6 miles E.N.E. of Coslin.

ZANTE, an island in the Mediterranean, near the coast of the Morea, about 12 miles in length, and six in breadth, chiefly inhabited by Greeks, till lately under the Venetians, who appointed a governor, called *provveditor*, and two counsellors. The Greeks have 40 churches, besides convents, and a bishop; the Roman Catholics have three convents and a bishop. By the treaty of Campo Formio, Zante was given to France; but in 1799 it was taken by the united fleets of Russia and Turkey, and in the year 1800 connected with other neighbouring islands, to form a republic of the Seven islands, named the Ionian, which are to pay a tribute to

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the Porte, and guaranteed both by the Turks and Russians. Corfu, Cephalonia, and some others lately in the possession of Venice, were of this number. The island produces excellent wine, and that species of grapes called currants, olives, figs, melons, peaches, and other choice fruits: towards the coasts, the island is in general mountainous, but level in the interior parts. It is much subject to earthquakes. N. lat. 37° 40'. E. long. 21° 4'.

ZANTE, a town and capital of the island of Zante, situated on the N.E. side, with a harbour safe and commodious for vessels of any size. The town stretches between the harbour and the foot of a mountain about a mile in length, but narrow; the streets are not paved, and the houses in general low. On a mountain above the town is a citadel, which commands the harbour, and contains a little city within its walls. It is to be ascended with difficulty, is strong, and well supplied with stores, and furnished with a garrison. This is the residence of the governor and officers. Zante is the fee of a Greek and Latin bishop. There are several churches, and the Jews have a synagogue; 21 miles S.S.W. from the town of Chiarenza in the Morea. N. lat. 37° 50'. E. long. 21° 8'.

ZANTHENES, in *Natural History*, a name given by the ancients to a foffile substance found in Media. Pliny quotes Democritus for saying, that if rubbed in palm wine and saffron, it became soft as wax, and yielded a very sweet smell.

ZANTHER, in *Geography*, a town of Pomerelia; 10 miles S. of Marienburg.

ZANTHORRHIZA, in *Botany*, L'Herit. Stirp. Nov. t. 38. See XANTHORRHIZA.

ZANTHOXYLUM, Linn. Gen. 519. See XANTHOXYLUM.

ZANTHOXYLUM, in *Gardening*, contains plants of the hardy and tender exotic shrubby kinds, in which the species cultivated are, the Canada tooth-ache-tree, or Hercules's club (*Z. clava Hercules*), and the Chinese tooth-ache-tree (*Z. trifoliatum*).

The first is a plant of the tree kind, of which there is a variety; the ash-leaved tooth-ache-tree, with oval-oblong folioles, and prickly mid-ribs.

And the last is a woody branching plant.

Method of Culture.—These plants may be increased by seeds and layers. The seeds should be sown in the spring, either in an east border, or in pots placed in the morning sun all the summer, being sheltered in a frame in winter; and in the spring following removed to the full air till October, giving proper waterings all the summer; and towards winter be placed again under shelter from frost till March, when the young plants may be potted separately; and thus continued for a year or two, being sheltered in the winter, when they may be transplanted into the shrubbery, where they are to remain.

The layers of the young wood may be laid down in autumn or early spring, and when they have stricken root be taken off and managed as the seedlings.

They also succeed by cuttings in spring or summer, planted in pots, assisted by a hot-bed, in which they soon strike, when they should be inured to the full air; and the young plants will be fit for planting out in the autumn, or the spring following.

The first is a very ornamental plant in the borders and other dry parts of shrubberies, and the latter among potted plants in the green-house collections.

ZANTOCH, in *Geography*, a town of the New Mark of Brandenburg; 8 miles E. of Landsberg.

ZANZALUS, in *Botany*. See BARADEUS.

ZANZIBAR, or ZANGIBAR, in *Geography*, an island of Africa, in the Indian sea, near the coast of Zanguebar, governed by a king, who is tributary to the Portuguese. S. lat. 6°. E. long. 41° 15'.

ZANZOUR, a town of Africa, in the country of Tripoli; 15 miles W.N.W. of Tripoli.

ZAOIE, a town of Egypt, on the left bank of the Nile; 13 miles N. of Benituef.

ZA-OSTROG, a town of Morlachia, near the coast; 15 miles S.E. of Macarisk.

ZAOZERSKOI, a town of Russia, in the government of Novgorod, on the Sula; 28 miles W. of Tcherepovetz.

ZAPATA, or SAPATA, a kind of feast, or ceremony, held in Italy, in the courts of certain princes, on St. Nicholas's day, in which people hide presents in the shoes or slippers of those they would do honour to; in such manner, as to surprize them on the morrow, when they come to dress.

The word is originally Spanish, *capato*; and signifies a shoe, or slipper.

It is done in imitation of the practice of St. Nicholas; who used, in the night-time, to throw purses of money in at the windows, for portions to poor virgins in their marriage.

F. Menestrier has described these zapatas, their origin, and different usages, in his *Treatise des Ballets Anciens et Moderns*.

ZAPATERO, in *Geography*, a small island of Mexico, in lake Nicaragua, near the west coast; 30 miles S.E. of Grenada.

ZAPATILLA LAGOON, a bay on the east coast of Yucatan. N. lat. 18° 52'. W. long. 89° 32'.

ZAPETRA, in *Ancient Geography*, a town of Asia, in the mountains of Comagene, upon a small river, which discharged itself into the Euphrates, S. of that town.

ZAPPENDORF, in *Geography*, a town of Bavaria, in the bishopric of Bamberg; 9 miles N. of Bamberg.

ZAPHOR, a name given by some writers to *Zaffer*; which see.

ZAPOROGIAN COSSACKS, in *Geography*. See COSSACKS.

ZAPOTITLAN, a town of Mexico, in the province of Tlascalca; 62 miles S.E. of Puebla de los Angeles.

ZAPOTLAN, a town of Mexico, in the province of Mechoacan; 25 miles N. of Colima. N. lat. 20° 10'. W. long. 104° 36'.

ZAPPANIA, in *Botany*, was so named by Scopoli, in honour of Paul Anthony Zappa, an Italian botanist, to whom the public garden at Pavia was indebted for many valuable communications. The French, not always exact in orthography, will have it *Zapania*, and they have misled our more accurate countryman Mr. Brown, who follows Juslieu and Lamarck in adopting this genus, in his *Prodr. Nov. Holl. v. 1. 514*. Scopoli published it in his *Deliciae Floræ et Faunæ Insularum*, v. 1. 34. t. 15. The species, on which he founds the genus, and which he erroneously suspected might be the *Lantana involucreta* of Linnæus, is the *Verbena globiflora* of L'Heritier. (See *VERBENA*, n. 3.) We do not find it necessary or expedient to retain *Zappania* as a distinct genus.

ZAPUNTELLO, in *Geography*, a town of the island of Melada, which sometimes gives name to the island.

ZAQUALPAN, a town of Mechoacan, in the province of Mechoacan; 6 miles S. of Zacatula.

ZARA, a city and sea-port of Dalmatia, fee of an archbishop, situated in a district, called "The County of Zara," which was purchased of the king of Naples, in the year

1409, by the Venetians, in whose hands it afterwards continued. Zara is surrounded on all sides by the sea, except that it has a communication eastward with the continent, by means of a draw-bridge, commanded by a fort. It is reckoned one of the best fortifications in Dalmatia, and deemed almost impregnable. The citadel is divided from the town by a very deep ditch, hewn out of a rock. The harbour, which lies to the north, is capacious, safe, and well guarded. The rain is carefully preserved in cisterns, to supply the want of fresh water. In the castle resides the governor or provisor of Dalmatia, whose office is only triennial. It now belongs to the kingdom of Italy; 28 miles N.W. of Scardona. N. lat. $44^{\circ} 22'$. E. long. $15^{\circ} 38'$.

ZARA *Vecchia*, *Old Zara*, or *Biograd*, or *Alba Maritima*, a town of Dalmatia, now little better than a village. In the time of the Romans it was a place of considerable figure, and received a new set of inhabitants by a numerous colony of that people. In the middle ages it was called *Belgrad*, or *Alba Maris*, and more anciently *Blandona*. According to some it was ruined by Attila; but we know with more certainty that it was destroyed in the war between the Venetians and the Hungarians, by the doge Ordelafo Falieri. Some banditti afterwards mixing with the inhabitants the ancient inhabitants were not spared. Here was also a bishop's see, which, on the demolition of the town, was removed to Scardona; at present its inhabitants consist only of a few peasants; 18 miles S.E. of Zara.

ZARA. See SCHAREDSJE.

ZARA, in *Ancient Geography*, a town of the Moabites, taken by Alexander Jannæus.—Also, a town of Asia, towards Armenia, upon the route from Arabissum to Satala, between Eumææ and Dogolassum. Anton. Itin.

ZARAIK, in *Geography*, a town of Russia, in the government of Riazan, on the Oser; 24 miles S.W. of Riazan. N. lat. $54^{\circ} 30'$. E. long. $38^{\circ} 24'$.

ZARAMA, in *Ancient Geography*, a town of Asia, in the interior of Media. Ptolemy.

ZARANDA, a name anciently given to the Euphrates.

ZARANG, the *Zarange* of Ptolemy, in *Geography*, a populous city of Persia, in the province of Segestan or Seistan, situated pleasantly on the banks of the Hearmund. This was the customary residence of Jacob Ben Lath, the conqueror of the caliph of Bagdad, and stood a long siege against Timur, by whom it was at last taken. Zarang is supposed to be the same with the present Dooshak, the old name having been lost in the revolutions to which this province has been subject for more than a century, and to which its present desolated state may, in a great measure, be attributed. For a further account of it, see SEGESTAN.

ZARANIS, in *Ancient Geography*, a town of Asia, in the interior of Media. Ptolemy.

ZARATE, AUGUSTINE DE, in *Biography*, a Spanish historian, was sent by Charles V. in 1543 to South America, as comptroller-general in Peru and Terra Firma; and having collected all the memoirs he could procure, he composed his work "Del Descubrimiento y Conquista de la Provincia del Peru," first printed at Antwerp in 1555, 8vo. and reprinted at Seville, 1577, folio: the first edition being regarded as most authentic. It has been translated into Italian and French, and is commended as a work of reputation and credit by Dr. Robertson. Moreri. Robertson's America.

ZARATE, in *Geography*, a town of South America, in the province of St. Martha; 15 miles S. of Teneriffe.

ZARAYOS, or SHARAYOS, a supposed lake of America, in the course of the river Paraguay, which only exists during the annual inundations, that are on a far grander scale than those of the Ganges, and may be said to deluge whole provinces.

ZARCA, a town of Egypt, on the east branch of the Nile; 10 miles S. of Damietta.

ZARCHAS, or TCHARKAS, a town of Persia, in the province of Chorasan, or Khorassan; 150 miles N. of Herat.

ZARCOIA, a town of Persia, in the province of Segestan; 12 miles W. of Zarang.

ZARDAM. See SARDAM.

ZARE, a town of Persia, in the province of Chorasan, or Khorassan, on the north side of a lake so called; 70 miles S. of Herat.—Also, a lake of Persia, in the province of Segestan; 60 miles N. of Zarang. See ZERREH.

ZARED, in *Ancient Geography*, a torrent beyond Jordan, on the frontier of the Moabites. This torrent had its source in the mountains, E. of the country of Moab, and proceeding from the E. to the W. discharged itself into the Dead sea. The Israelites passed it 38 years before their departure from Kadesh-Barnea. Numb. xxi. 12. Deut. ii. 13, 14.

ZAREPHATH. See SAREPTA.

ZARESH-SHEKER, or SARAT-AFER, a city of Reuben, beyond Jordan. Josh. xiii. 19.

ZARETHÆ, or ZARETE, a people comprised under the name of Scythians, on this side of the Imaus, south of mounts Massæ and Alani. Ptol.

ZAREX, a port of Laconia, on the Argolic gulf, S. of Cyphanta. Near this port was a temple of Apollo, with a statue of this god, holding in his hand a lyre. To the south, and parallel to the coast, was a mountain called Zarex.

ZARFA, in *Botany*, a name given by Leo Africanus, and others, to the *lotus*, or nettle-tree.

ZARGIDAVA, in *Ancient Geography*, a town situated on the bank of the river Hierafus, in the interior of Lower Mæsia, a little above Tamafava.

ZARIASPA, or ZARIASPE, a town of Asia, in Bactriana, watered by a river of the same name, which discharged itself into the Oxus. Strabo. It was also called Bactra. Steph. Byz.

ZARIFU, a word by which some of the chemical writers have expressed tin.

ZARIK, in *Geography*, a town of European Turkey, in the Morea; 22 miles E. of Mistra.

ZARIMA, a town of South America, in the province of Quito; 220 miles S. of Quito. S. lat. $3^{\circ} 36'$. W. long. $79^{\circ} 36'$.

ZARJON, a town of South America, in the government of Buenos Ayres; 300 miles N.N.W. of Buenos Ayres.

ZARLINO, GIUSEPPE *da Chioggia*, maestro di capella of St. Mark's church at Venice, and the most general, voluminous, and celebrated theorist and writer on music in the Italian language during the 16th century, was born in 1540, and author of the following musical treatises, which, though separately printed, and at different periods, are generally bound up together in one thick folio volume:—"Institutioni Harmoniche," Venice, 1558, 1562, 1573, and 1589; "Dimostrazioni Harmon." Ven. 1571, and 1589; and "Supplimenti Musicali," Ven. 1588. We discover by these dates, that Zarlino first appeared as an author at the age of 18; and from that period till he had arrived at 49, he was continually revising and augmenting his works.

The

The musical science of Zarlino, who died in 1599, may be traced in a right line from the Netherlands: as his master Willaert, the founder of the Venetian school, was a disciple of John Mouton, the scholar of the great Josquin.

A commentary upon the voluminous writings of this author would occupy too large a portion of our work; and to refer the reader to the analysis of his several treatises by Artusi would be doing him little service, as the writings of Artusi would be difficult to find. There are few musical authors whom we have more frequently consulted than Zarlino, having been encouraged by his great reputation, and the extent of his plan, to hope for satisfaction from his writings concerning many difficulties in the music of the early contrapuntists; but we must own, that we have been more frequently discouraged from the pursuit by his prolixity, than enlightened by his science: the most trivial information is involved in such a crowd of words, and the suspense which it occasions is so great, that patience and curiosity must be invincible indeed to support a musical inquirer through a regular perusal of all his works.

He begins his *Institutes* with a panegyric upon music, in the usual strain; then we have its division into mundane and humane, faithfully drawn from Boethius; after this, there is a great waste of words, and parade of science, in attempting to explain the several ratios of greater and less inequality, proportion, and proportionality, &c. where, in his commenting on Boethius, we have divisions of musical intervals that are impracticable, or at least inadmissible, in modern harmony.

In his account of the ancient system, he discovers much reading; and that is what he chiefly wishes the reader should know.

In describing the diatonic genus, in which the tetrachord is divided into tone major, tone minor, and major semitone: $\frac{9}{8}$, $\frac{10}{9}$, and $\frac{11}{9}$, for which division, commonly called the syntonous, or intense of Ptolemy, he constantly contends, we have the substance of his dispute with Vincenzo Galilei, which will be mentioned hereafter. The second part of his *Institutes* is chiefly employed in measuring and ascertaining intervals by means of the *monochord*, and an instrument called the *mesolabe*, which is said to have been invented either by Archytas of Tarentum, or Erastobenes, for the purpose of halving an interval. Whether the practical divisions of antiquity applied these calculations or imaginary divisions to their flutes and lyres, we know not; but of this we are most certain, that the greatest performers of modern times are Aristoxenians, and make the *ear* the only instrument of calculation; which, by means of harmony, and the constant opportunities of comparison which the base or other accompaniment affords them, during performance, is rendered a much more trusty guide than it could be in playing a single part. It seems, however, as if the ancient instruments, upon which all the tones are fixed, had more need of the assistance of calculation and mathematical exactness in regulating their intervals than those of the violin-tribe at present; which, except in the open strings, which often lead the performer to erroneous intonation, depend on the strength and dexterity of the musician's hand, and accuracy of his ear, during performance. See an ingenious and useful work, called "Essay upon Tune," published at Edinburgh, 1781; where the imperfections in the scales of modern instruments are clearly shewn, and remedies for correcting them prescribed.

The elements of counterpoint, and fundamental rules of composition, which chiefly concern the practical musician, are given in the third part of the *Institutes*; and these are more ample, and illustrated with more examples, than in any

preceding writer; particularly the laws of canon and fugue, for which no instructions have been given by Franchinus, though they were in such high favour during his time. P. Aaron and Vicentino have indeed started the subject, but the pursuit of it was left to Zarlino.

In the fourth part of the *Institutes* we have a short historical account of the inventors of the several ecclesiastical modes: it is, indeed, a mere skeleton of assertions or conjectures without proof, more derived from traditional than written evidence. He here likewise gives instructions for composing in all these modes, in which he religiously keeps within their legal limits, and submits to all the restraints which antiquity had prescribed.

Padre Martini, faggio di contrappunto, in recommending the study and imitation of ancient masters, has well described the difficulties they had to encounter; where, after confronting the ecclesiastical scales with the secular, we have the following passage: "From an attentive and comparative view of these scales, any one desirous of learning the art of counterpoint for the service of the church, will see what diligence and efforts were necessary to unite the different qualities of canto-fermo and canto-figurato; and by carefully examining the examples given of both, will discover what artifices were used by ancient masters to avoid such sounds as differed from the canto-fermo, and with what parsimony they admitted such accidents as canto-figurato requires, particularly in the third and fourth tones; where, instead of modulating into B *mi*, the 5th of the mode or key, as is constantly practised at present, they have passed to the key of A in the fourth tone, and C in the third, by which means they have been able, dexterously, to unite the different qualities of canto-fermo with those of canto-figurato."

He gives excellent rules for composing motets and madrigals; but it is remarkable, that he advises the composer to make the *tenor* proceed regularly through the sounds of the mode he shall choose; and above all, that this part be so much the more smooth, regular, and beautiful, as the rest are to be built upon it; whence, says he, its sounds may be called the nerves and ligaments of all the other parts: by which it appears that the cantilena, or principal melody, was not given, as it is by modern composers, to the *soprano*, or *highest* part; that *castrati* were not so common as at present; and that the *tenor* being the kind of voice most easily found, and more generally good than that of any other pitch, was judiciously honoured with the principal melody.

Zarlino says, that so great was the rage for multiplying parts in musical compositions, that some masters, not content with three or four, which sufficed to their predecessors, had increased them to fifty; from which, he truly observes, nothing but noise and confusion could arise. However, in another part of his book, he tells us, that Adriano Willaert had invented masses à *Due Cori*, over a *tre*, or, as some call them, à *Gori Spezzati*, which had an admirable effect. We know not how Okenheim disposed his thirty-six parts in the motet already mentioned; but they would have furnished nine choirs of four voices each. In the large churches of Italy, where the performers are divided into two bands, placed in opposite galleries, all the imitations and solo parts are distinctly heard, and when united in at least eight *real* parts, completely fill the ears of the audience with all the charms of congregated sound.

ZARMISOGETUSA REGIA, in *Ancient Geography*, a capital town of Dacia, upon the river Sargetia. When this city became a Roman colony, it joined to its ancient name "Colonia Ulpia Trajana," or that of "Augusta Dacia."

roundish, stalked, longer than the glumes; angular and compressed at the base.

Obf. Two out of the four valves of the female corolla appear to belong to an abortive flower. *Schreber*.

Eff. Ch. Male flowers in distinct spikes. Calyx a two-flowered beardless glume. Corolla beardless.

Female, Calyx a glume of two valves. Corolla of four valves. Style one, thread-shaped, pendulous. Seeds foliary, imbedded in an oblong receptacle.

1. *Z. mays*. Common Maize, or Indian Corn. Linn. Sp. Pl. 1378. Willd. n. 1. Ait. n. 1. Pursh n. 1. (*Frumentum indicum*; Camer. Epit. 186. *F. afaticum*, turcicum et indicum; Ger. Em. 81, 82. Morif. sect. 8. t. 13. f. 1, 2, 3.)—Leaves entire.—Native of America. Cultivated there, as well as in the southern countries of Europe. One of the largest of the family of corn or grasses. Root annual, of innumerable fibres. Stem erect, somewhat branched, round, stout, jointed, leafy, from five to ten feet high. Leaves sheathing, lanceolate, concave, acute, ribbed, two or three feet long, and three or four inches broad. Male flowers in numerous, aggregate, terminal spikes, each three or four inches long, greyish, downy, with purple anthers. Female ones below, in a generally simple, cylindrical spike, covered by the large sheaths of the upper leaves. Styles six or eight inches long, very numerous, of a shining yellowish or reddish hue, hanging down like a long silken tassel. Seeds white, yellow, red, or purplish, forming a heavy, tessellated, cone-like, naked spike, from six to ten inches long. There are innumerable varieties, in the size, figure, colour, and qualities of the grain, which, though valuable for many purposes, and yielding an abundant crop, is far inferior to wheat as a bread corn. It requires a richly manured soil. Mr. Pursh mentions a variety, brought lately by governor Lewis from the Mandan nation, on the Missouri, which promises to be particularly valuable, as ripening earlier than any other sort, and yielding an excellent produce. See MAIZE.

2. *Z. Curagua*. Chili Maize. "Molina Chil. German edition, 107." Willd. n. 2.—Leaves serrated.—Native of Chili. Annual. Smaller in all its parts than the foregoing. *Molina*. Of the qualities or history of this species, we have no further account.

ZEA, in Gardening, contains a plant of the hardy herbaceous annual kind, of which the species cultivated is the maize, or Indian corn (*Z. mays*).

It has a large strong, herbaceous stalk, which sometimes rises to the height of ten or twelve feet; and there are varieties; with yellowish-white seeds, with deep yellow seeds, and with purple-blue seeds. This plant is mostly cultivated in the garden and pleasure ground for the sake of its singular tall growth.

Method of Culture.—These plants may be raised by sowing seed in the spring, as March or April, in a dry warm situation, where the plants are intended to remain, in patches of two or three seeds or more in each, about an inch and a half deep: when the plants are come up, they should be thinned out to one or two of the strongest. But to have the plants more forward, so as to produce ripe feed-spikes more effectually, some should be sown in a hot-bed at the same time, and when the plants are three or four inches high, be forwarded by pricking them out upon another hot-bed, either under a deep frame, or an awning of hoop arches, to be covered with mats occasionally, allowing them plenty of free air; and when they have sufficient growth, as in May, they may be transplanted, with balls of earth about their roots, into the full ground in the borders or shrubbery

clumps, in warm funny situations, being well watered; and when the summer proves warm and dry, they often produce perfect heads, and the seeds ripen in a good manner.

As the plants mostly run up in tall stalks, it is proper to support each with a tall neat stake, especially where much exposed to wind and rain.

These plants in the different varieties have a fine effect in the back parts of borders, clumps, and other places, in warm sheltered situations.

It is observed by a late writer, that he has planted a small quantity of this sort of grain in his garden, and it turned out superior to his expectations; and he is of opinion, that this crop may be raised to advantage in the field on some light soils, particularly the poor sands of Norfolk and Suffolk, or on any hot burning lands; as the countries where it grows naturally are light hot soils. And he adds, that he prefers the drill method of culture for it in this country; as the small hillocks in planting the feeds separately make the land unfitly and improper for other crops. But to raise the greatest produce in corn, the hills are, he conceives, the best way; however if the crop is intended chiefly for fodder, then drills are best. The feed is to be put about an inch deep in the ground. And that when the corn first appears above the surface, the hillocks or drills must be examined, to see whether it all comes up properly; and if it has not, there must be fresh feeds put into the vacant places to prevent a loss in the crop. And as soon as the plants take root in the ground, the crop should be examined again to see whether any have died away, or the birds have taken the feed. The plants must also be thinned to two on a hill, and good plants substituted for weak ones.

In the cultivation while growing in the hill-way, the hoe must be used at every operation to the plants, and earth be given to them, as the land cannot be made too light for this crop; but when in drills, the corn must be hoed in the same manner as garden peas.

He also further observes, that when the corn gets out of the milk, the blades below must be all pulled off while green: tie them up in small bunches, about the size of a birch-broom, and hang them on the top of the stalks of the corn; for at the same time that the blades are pulled, the tops must be cut off, and set up in round bunches to dry, and tied round the topmost part to keep them from falling: when these are dry, they must be harvested. The blades are generally ready in four or five days, but the tops take longer; when these blades and tops are properly harvested, they are excellent food. And it is suggested, that as these processes will be finished about the end of August, the land might be ploughed and then sown with rye. If feeds were required, he is of opinion that it would be very proper to sow the feeds at that time on this poor hot land; as the warm season would be over, and the feeds would have sufficient time to take root before winter. If only rye was wanted, he would eat it with sheep in the spring or during the winter. But the stalks must, he says, stand, for the corn to ripen after the rye is sown; and the corn ought to hang on the stalk till it is hard. In America, it is often December before the white corn can be pulled, or September for the yellow corn: if it is pulled before it is hard, and the cob is perfectly dry, it will mould and spoil, and the corn will be apt to rot, therefore great care should be taken not to pull it too soon.

This sort of corn is, it is said, given to horses, cattle, and hogs, without shelling, and only husked in the ear; but when given to fowls, or intended for sale, it is rubbed off by burning a cob in the fire till hard, and then rubbing the corn with

with it. It is a fort of grain which is sometimes given to pigs, but more frequently when ground to fowls. Count Rumford has shewn in his Essay on Food, that this is perhaps the most nutritious grain, except wheat, either as human sustenance, or as provender for brute animals. See MAIZE.

ZEAL, in *Geography*. See ZIA.

ZEAGONG, a town of Birmah; 12 miles N.N.W. of Raynangong.

ZEAL, ΖΕΛΟΣ, Ζηλος, the exercise of a warm animated affection, or passion, for any thing.

Some will have jealous *zeal* to be properly a mixed or compound sensation, where one affection is raised or inflamed by another. On these principles, jealousy may be defined an affection arising from love and indignation, which cannot bear a thing to be given to another, that a person desires for himself, or one whom he loves and favours. Others make it consist in an eager study, or desire, to keep any thing inviolate; or a fervour of mind, arising from an indignation against those who abuse or do evil to a person beloved.

The Greek philosophers make three species of *zeal*. The first, of *envy*; the second, of *emulation*, or imitation; the third, of *piety*, or devotion; which last makes what the divines call *religious zeal*.

Josephus speaks much of a party, or faction, called the *Zealous*, or *Zealots*, which arose among the Jews during the war with Vespasian and Titus. Lib. xiv. cap. 6. Antiq. and lib. iv. cap. 12. de Bello Judaico.

ZEALAND, or ZEELAND, or *Seeland*, (in Danish *Sjeland*), in *Geography*, the largest island belonging to the kingdom of Denmark, bounded on the north by the Scagerrack, on the east by the Sound, on the south by the Baltic, and on the west by the Great Belt; about 65 miles in length from north to south, and where widest 60 from east to west, though in some parts scarcely 30, and in no part above 20 miles from the sea: reckoned about 700 miles in circumference. The coast is much interfectured with large bays; and within the country are several lakes, which, as well as the rivers, abound in fish. The country is pleasant; the soil is generally fertile, and produces corn, chiefly barley and oats, more than sufficient for the inhabitants, with excellent pastures; and in most parts is plenty of wood, except towards the centre of the island, where the inhabitants generally use turf for fuel. The fields are separated by mud-walls; the cottages are of brick or white-washed: sand-hills are sometimes destructive on the coast; and the best protection from their ravages, says Cateau, is the *elymus anemaria*. Copenhagen is the capital. N. lat. 55° 2' to 56° 6'. E. long. 10° 58' to 12° 40'. See DENMARK.

ZEALAND, *State of*, one of the former United Dutch States, and now part of the recently established kingdom. It consists of islands which are formed by those branches and outlets of the Scheldt, called *Zeeuwfche Stromen*, or *Sea Streams*; on the north it is bounded by Holland, eastward by Brabant, southward by Flanders, and westward by the North sea: its name sufficiently indicates its natural position and situation. The islands of Walcheren and Schouwen, on the western coast, are defended against the violence of the sea, by downs or sand-hills, and on the other sides, like the rest of the islands of Zeeland, by vast dykes, which, at the bottom, have a breadth of 25 German ells, and at the top are so wide, that two carriages may pass abreast: the height is also proportioned to their thickness; notwithstanding which, in high tides and stormy weather, the waves in many places force a passage, or even flow over them: the first formation of these dykes must have been attended with

immense expence, the very repair and maintenance of them requiring large sums. Emanuel van Meteren, in the sixteenth book of his Commentaries, says, and confirms it by the attestations of the workmen employed in them, that the dykes in this province alone, if placed in one direction, would form a length of 40 miles, each mile to be reckoned at 1400 rods, and that the expence of one rod with another was a pound Flemish, or six Dutch guilders. Thus the charge of the outward dykes taken together amounts to 340,000*l.* sterling. Though the inhabitants of the other provinces, and foreigners in general, complain of the air being heavy, disagreeable, and unhealthy, yet no people look better, or enjoy a more confirmed state of health, than the natives who are born and bred up in it. The soil too is very fruitful, and famed for its excellent wheat, as likewise for madder, the cultivation of which furnishes out great employment for the inhabitants of Zeeland: it abounds also in good fruits, and its rich pastures are covered with flocks of fine sheep. The waters around the islands supply them with plenty of fish, particularly with oysters, lobsters, and muscles, of an uncommon size and goodness. Zeeland enjoys likewise an affluence of all kinds of provisions, but fuel is very scarce there, especially turf, which, being brought from other provinces, bears a high price; great quantities of English coals are used here. In the whole province are 121 towns and villages, some of which are very large. The inhabitants are reckoned the most wealthy in all the Netherlands, which is, in a great measure, owing to their traffic by sea, and for this, indeed, they have every convenience that can be desired. (See HOLLAND.) The right bank of the Scheldt, called the East Scheldt, divides this province into two quarters, *viz.* into that on the east and that on the west of the said river. The quarter on the West Scheldt is composed of five islands, *viz.* Walcheren, South Beveland, North Beveland, Wolferdyk, and St. Joostland. The quarter of the East Scheldt contains four islands, *viz.* Schouwen, Duiveland, Tholen, and St. Philip's Land.

ZEALAND, *New*, two islands in the South Pacific ocean, first discovered by Tasman, a Dutch navigator. In the year 1642, he traversed the eastern coast from lat. 34° to 43°, and entered the strait called Cook's Strait; he was attacked by the natives soon after he came to an anchor in the place, to which he gave the name of Murderer's Bay, and never went on shore: he gave the country the name of Staaten Land, in honour of the states-general, and it is now generally distinguished in our maps and charts by the name of New Zealand. As the whole of this country, except that part of the coast which was seen by Tasman from on board his ship, had from his time to the voyage of the Endeavour, in the year 1770, remained altogether unknown, it was by many supposed to be part of a southern continent. It is, however, now known to consist of two large islands, divided from each other by a strait or passage, which is about four or five leagues broad. The northernmost of these islands is called by the natives *Eaheinomauwe*; and the southernmost *Tovy*, or *Tavai Poenamoo*. The latter is the name of a lake, and signifies the water of green talc. This lake is situated in the northern part of the island, and the country adjoining it only is known to the natives under this name. From my observation, says captain Cook, and from other information, it appears to me, that the New Zealanders must live under perpetual apprehensions of being destroyed by each other; there being few of their tribes that have not, as they think, sustained wrongs from some other tribe, which they are continually upon the watch to revenge; and perhaps the desire of a good meal may be no small incitement. They will even prefer their enmity from father to

son, and the son never loses sight of an injury done to his father. The method of executing their horrible designs is by stealing upon their enemies in the night; and if they find them unguarded, (which however is but seldom the case,) they kill every one indiscriminately, not even sparing the women and children: the dead bodies they either devour on the spot, or carry them home for that purpose. If they are discovered before they can execute their bloody purpose, they generally steal off; and sometimes are pursued and attacked by the other party in their turn. They never give quarter, or take prisoners. This perpetual state of warfare renders them so circumspect, that they are never off their guard either by night or day. According to their system of belief, the soul of the man whose flesh is devoured by the enemy is doomed to perpetual fire; while the soul of him whose body has been rescued, as well as those who die a natural death, ascend to the habitation of the gods. They do not eat the bodies of their friends who have been rescued. Their common method of disposing of the dead is by burying in the earth; but if they have more of their slaughtered enemies than they can eat, they throw them into the sea. They have no such things as morals, or other places of public worship; nor do they ever assemble together with this view. But they have priests who alone address the gods in prayers for the prosperity of their temporal affairs. Whatever the principles of their religion may be, they are strongly inculcated from their infancy: of this I had a remarkable instance in the youth who was first destined to accompany Taweharooa. He refrained from eating the greatest part of the day on account of his hair being cut; though every method was tried to induce him to break his resolution; and he was tempted with the offer of such victuals as he was known to like best. He said, that if he ate any thing that day, the Eatooa would kill him: however, towards evening the cravings of nature got the better of the precepts of religion, and he ate, though but sparingly. Notwithstanding the divided and hostile state in which the New Zealanders live, travelling strangers who come with no ill design are well received, and entertained during their stay; which, however, it is expected will be no longer than is requisite to transact the business that they come upon. Polygamy is allowed amongst the people: the women are marriageable at a very early age; and one who is unmarried is but in a forlorn state: she can with difficulty get a subsistence, and is in a great measure without a protector, though in continual want of a powerful one. The New Zealanders seem to be perfectly satisfied with the little knowledge they are masters of without attempting in the least to improve it; nor are they remarkably curious either in their observations or inquiries. Tovy Poenamoo is for the most part a mountainous, and to all appearances a barren country, and thinly peopled. Eaeheinomauwe has a much better appearance; it is indeed not only hilly, but mountainous, yet even the hills and mountains are covered with wood, and every valley has a rivulet of water; the soil in these valleys and in the plains, of which there are many that are not overgrown with wood, is in general light, but fertile, and fit for every kind of European grain, plants, and fruit. From the vegetables that were found here, there is reason to conclude the winters are milder than in England, and the summer not hotter, though it was more equally warm: dogs and rats are the only quadrupeds that were seen, and of the latter only a few. The inhabitants breed the dogs for the sole purpose of eating them. There are seals and whales on the coast, and a sea-lion was once seen. The birds are, hawks, owls, quails; and there are song-birds, whose note is wonderfully melodious. There are ducks and

snags of several sorts, not unlike those of Europe; and the gannet, which is exactly the same. The sea-coast is visited by albatrosses, sheer-waters, pintados, and penguins. The insects are, flesh-flies, beetles, butter-flies, sand-flies, and musquitoes; and the neighbouring sea abounds with fish, which are equally delicious and wholesome food. Captain Cook seldom came to anchor but they caught enough, with hook and line only, to supply the whole ship's crew; and when they fished with nets, every mesh in the ship, except those who were too indolent, faltered as much as supplied them when at sea some time after. The fish was not less various in kind than plentiful in quantity; there were many sorts they had never before seen, but the sailors readily gave names to all of them. The highest luxury which the sea afforded was the lobster, or sea cray-fish. Here were also several species of the skate, or stingray: soles, flounders, and shell-fish, were abundant. This country abounds with forests filled with very large, straight, and clean timber. There is one tree about the size of an oak, which was distinguished by a scarlet flower, that appeared to be composed of several fibres; the wood of which was hard and heavy, excellently adapted to the use of the mill-wright: and another which grows in swampy ground, very straight and tall, bearing small bunches of berries, and a leaf resembling that of a yew-tree; the wood of which is very tough, and thick enough to make masts of any size: about 400 species of plants were found, all of which are unknown in England, except garden night-shade, fow-thistle, two or three kinds of fern, and one or two sorts of grass. They found wild celery, and a kind of cresses, in great abundance on the sea shore, and of eatable plants raised by cultivation, only cocoas, yams, and sweet potatoes. There are plantations of many acres of these yams and potatoes. The inhabitants likewise cultivate the ground; and the Chinese paper mulberry-tree is to be found, but in no abundance. There is only one shrub or tree in this country which produces fruit, and that is a kind of a berry almost tasteless; but they have a plant which answers all the uses of hemp and flax. There are two kinds of this plant, the leaves of one of which are yellow, and the other deep-red, and both of them resemble the leaves of flax; of these leaves they make lines and cordage, and much stronger than any thing of the kind in Europe. These leaves they likewise split into breadths, and tying the slips together form their fishing-nets. Their common apparel by a simple process is made from leaves, and their finer by another preparation is made from the fibres. This plant is found both on high and low ground, in dry mould, and deep bogs; but as it grows largest in the latter, that seems to be its proper soil.

The men of this country are as large as the largest Europeans. Their complexion is brown, but little more so than that of a Spaniard. They are full of flesh, but not lazy or luxurious, and are stout and well shaped. The women possess not that delicacy which distinguishes the European ladies, but their voice is singularly soft, which, as the dress of both sexes is similar, chiefly distinguishes them from the men. The men are active in a high degree; their hair is black, and teeth are white and even. The features in both sexes are regular; they enjoy perfect health, and live to a very advanced age; they are of the gentlest dispositions, and treat each other with the utmost kindness, but they are perpetually at war, every little distrust being at enmity with all the rest, and towards their enemies they are implacable, never giving quarter. They have neither black cattle, sheep, hogs, nor goats; so that their chief food being fish, and that not at all times to be obtained, they are

in danger of dying through hunger: they have a few, and but a very few dogs; and when no fish is to be got they have only vegetables such as fern-root, clams, yams, and potatoes to feed on; and if by any accident these fail them, their situation must be deplorable. This will account for their shocking custom of eating the bodies which are slain in battle, for he who fights through mere hunger will not scruple to eat the adversary he has killed. The inhabitants of New Zealand are modest and reserved in their behaviour and conversation. The women, indeed, were not dead to the softer impressions; but their mode of consent was, in their idea, as harmless as the consent to marriage with us, and equally binding for the stipulated time. If any of the English addressed one of their women, he was informed, that the consent of her friends must be obtained, which usually followed on his making a present. This done, he was obliged to treat his temporary wife at least as delicately as we do in England. They anoint their hair with oil, melted from the fat of fish or birds. The poorer people use that which is rancid, so that their smell is very disagreeable: but those of superior rank make use of that which is fresh. They wear combs, both of bone and wood, which are considered as an ornament when stuck upright in the hair. The men tie their hair in a bunch on the crown of their head, and adorn it with the feathers of birds, which they likewise sometimes place on each side of the temples. They commonly wear short beards; the hair of the women sometimes flows over the shoulders, and sometimes is cut short. Both sexes, but the men more than the women, mark their bodies with black stains called *Amoco*; in general the women stain only the lips, but sometimes mark other parts with black patches; the men, on the contrary, put on additional marks from year to year, so that those who are very ancient are almost covered. Exclusive of the *Amoco*, they mark themselves with furrows: these furrows make a hideous appearance, the edges being indented, and the whole quite black. The ornaments of the face are drawn in the spiral form, with equal elegance and correctness, both cheeks being marked exactly alike, while the painting on their bodies resembles fillagree work, and the foliage in old chased ornaments, but no two faces or bodies are painted exactly after the same model. These Indians likewise paint their bodies, by rubbing them with red ochre, either dry, or mixed with oil. Their dress is formed of the leaves of the flag, split into slips, which are interwoven, and made into a kind of matting, the ends which are seven or eight inches in length hanging out on the upper side. One piece of this matting, being tied over the shoulders, reaches to the knees; the other piece, being wrapped round the waist, falls almost to the ground. These two pieces are fastened to a string, which, by means of a bodkin of bone, is passed through, and tacks them together. The men wear the lower garment only at particular times. What they consider as the most ornamental part of their dress is the fur of dogs, which they cut into stripes, and sew on different parts of their apparel. As dogs are not in plenty, they dispose these stripes with great economy. They have a few dresses ornamented with feathers; and one man was seen covered wholly with the red feathers of the parrot. The women never tie their hair on the top of their head, nor adorn it with feathers; and are less anxious about dress than the men. Their lower garment is bound tight round them, except when they go a-fishing, and then they are careful that the men shall not see them. The ears of both sexes are bored, and the holes stretched so as to admit a man's finger. The ornaments of their ears are, feathers, cloth, bones, and sometimes bits of wood: a great

many of them use nails, which were given them by the English for this purpose; and the women sometimes adorn their ears with the white down of the albatross, which they spread before and behind the hole, in a large bunch. They likewise hang to their ears by strings, chiefs, bodkins, the teeth of dogs, and the teeth and nails of their deceased friends. The arms and ancles of the women are adorned with shells and bones, or any thing else through which they can pass a string. The men wear a piece of green talc, or whalebone, with the resemblance of a man carved on it, hanging to a string round the neck.

The houses are from sixteen to twenty-four feet long, ten or twelve wide, and six or eight in height. The frame is of slight sticks of wood, and the walls and roof are made of dry grass, pretty firmly compacted. Some of them are lined with bark of trees, and the ridge of the house is formed by a pole, which runs from one end to the other. The door is only high enough to admit a person crawling on hands and knees; and the roof is sloping. There is a square hole near the door, serving both for window and chimney, near which is the fire-place. A plank is placed near the door, adorned with a sort of carving, and this they consider as an ornamental piece of furniture. The side walls, and roof, projecting two or three feet beyond the walls at each end, form a sort of portico, where benches are placed to sit on. The fire is made in the middle of a hollow square in the floor, which is inclosed with wood or stone. They sleep near the walls, where the ground is covered with straw for their beds. Besides the fern-root, which serves them for bread, they feed on albatrosses, penguins, and some other birds. Whatever they eat is either roasted or baked, as they have no vessels in which water can be boiled. No plantations of coconos, potatoes, and yams, were seen to the southward, though there were many in the northern parts. The natives drink no other liquor than water, and enjoy perfect and uninterrupted health. When wounded in battle, the wound heals in a very short time, without the application of medicine; and the very old people carry no other marks of decay about them than the loss of their hair and teeth, and a failure of their muscular strength, but enjoy an equal share of health and cheerfulness with the youngest.

The canoes of this country are not unlike the whale-boats of New England, being long and narrow. Those of the larger sort seem to be built for war, and will hold from 30 to 100 men; one of these measured near seventy feet in length, six in width, and four in depth. It was sharp at the bottom, and consisted of three lengths, about two or three inches thick, and tied firmly together with strong plaiting: each side was formed of one entire plank, about twelve inches broad, and about an inch and a half thick, which were fitted to the bottom part with equal strength and ingenuity. Several thwarts were laid from one side to the other, to which they were securely fastened, in order to strengthen the canoes. These vessels are rowed with a kind of paddles, between five and six feet in length, the blade of which is a long oval, gradually decreasing till it reaches the handle; and the velocity with which they row with these paddles is surprising: their sails are composed of a kind of mat or netting, which is extended between two upright poles, one of which is fixed on each side. Two ropes fastened to the top of each pole serve instead of sheets. The vessels are steered by two men, having each a paddle, and sitting in the stern; but they can only fail before the wind, in which direction they move with considerable swiftness.

These Indians use axes, adzes, and chisels, with which last they likewise bore holes. The chisels are made of jasper, or of the bone of a man's arm; and their axes and adzes of a hard black stone. Their tillage of the ground is excellent, owing to the necessity they are under of cultivating, or running the risk of starving. A long narrow flake, sharpened to an edge at bottom, with a piece fixed across, a little above it, for the convenience of driving it into the ground with the foot, supplies the place both of plough and spade. The soil being light, their work is not very laborious, and with this instrument alone they will turn up ground of six or seven acres in extent. Their fish-hooks are of shell or bone; and they have baskets of wicker-work to hold the fish. Their warlike weapons are, spears, darts, battle-axes, and the patoo-patoo, in which they chiefly confide. This is fastened to their wrists by a strong strap, lest it should be wrenched from them, and the principal people generally wear it sticking in their girdles, considering it as a military ornament and part of their dress, like the poinard of the Asiatic and the sword of the Europeans. The spear, which is pointed at each end, is about twenty-six feet in length, and they hold it in the middle, so that it is difficult to parry a push from it. Whether they fight in boats or on shore, the battle is hand to hand; their contests must be bloody. The war-dance consists of a great variety of violent motions and hideous contortions of the limbs, during which the countenance and tongue perform their parts. This horrid dance is always accompanied by a song, every strain of which terminates with a deep and loud sigh.

The employment of the men is supposed to consist in cultivating the ground, making nets, catching birds, and fishing; while the women are engaged in weaving cloth, procuring fern-roots and shell-fish, and dressing food. With regard to religion, they acknowledge one superior being, and several subordinate. Their mode of worship could not be learned, nor was any place proper for that purpose seen. There was indeed a small square area, encompassed with stones, in the middle of which hung a basket of fern-roots on one of their spades. This they said was offered to the gods, in the hope of a plentiful crop of provision. The inhabitants of the southern district said they disposed of their dead by throwing them into the sea; but those of the north said they buried them in the ground: captain Cook's crew, however, saw not the least sign of any grave, or monument; but the body of almost every inhabitant bore the marks of wounds which they had given themselves, in token of grief for the loss of their friends and relations. Some of these scars were newly made, which is a proof that their friends had died while the ship's crew were there, yet no one saw any thing like a funeral, as the islanders conceal every thing respecting the dead with the utmost caution. A great similitude was observed between the dress, furniture, boats, and nets of the New Zealanders, and those of the inhabitants of the South sea islands, which furnish a strong proof that the ancestors of both were natives of the same country. The language of New Zealand and Otaheite is radically the same; and that of the northern and southern parts differs chiefly in the pronunciation. S. lat 34° to 48°. W. long. 181° to 194°. Cook's Voyages by Hawkefworth, vol. iii.

ZEAMAH, a river of Algiers, which runs into the Mediterranean, 6 miles S.S.E. of Cull.

ZEAN, a town of Hindoostan, in Dooab; 20 miles S. of Canoe.

ZEB, or ZIB, a town of Syria, near the sea-coast, an-

ciently called Achfaph, Achzib, and Ecdippa; 9 miles from Acre.

ZEBAIDE, a town of Persia, in the province of Farfistan; 80 miles E. of Schiras.

ZEBDAINEH, a village of Syria, built on the spot where it is said by some that Cain slew his brother Abel; 14 miles N.W. of Damafcus.

ZEBE, or ZAAB, in *Ancient Geography*, a town which once formed a part of Mauritania Sitifensis; it was situated at the foot of the chain of mount Atlas.

ZEBEE, in *Geography*, a river of Abyssinia, which runs into the Indian sea.

ZEBEER, a town of Arabian Irak; 12 miles W. of Bassorah.

ZEBEN. See SZEBEN.

ZEBET, a word used by some of the chemical writers to express dung.

ZEBID, in *Geography*, a city of Arabia, in the province of Yemen. Zebid was once the place of a sovereign's residence, and the most commercial city in all Tehama; but since the harbour of Ghalefka was choked up, its trade has been transferred to Beit el Fakih and Mocha, and this city now retains nothing but the shadow of its former splendour. Viewed from a distance, it appears to some advantage, by means of the mosques and kubbets, of which it is full. Several of those mosques were erected by different pachas, who resided here during the short period while this part of Arabia was in the possession of the Ottoman Porte. Zebid had once eight gates; of these only five are now standing, and the river is gradually breaking down a part of them. The walls of the old city are demolished, and the very ruins are sold by poor people, who gather out the stones, and sell them for building new houses. The present buildings occupy about one half of the ancient extent of the city. Zebid is still distinguished for an academy, or university, for the Sunais, as that of Damar is for the Seidites, in which the youth of Tehama, and a part of Yemen, study such sciences as are cultivated among the Mussulmen. This is besides the seat of a dola, a mufti, and three cadis; 52 miles N. of Mocha. N. lat. 14° 12'. E. long. 43° 15'.

ZEBIO, a mountain of Italy, which sometimes emits flames; 6 miles S. of Modena.

ZEBLIUM MARMOR, in *Natural History*, a name given by several authors to a soft green marble, variegated with black and white; and though the authors who have described it have not observed it, yet it no way differs from the white ophites of the ancients. See OPHITES.

ZEBOIM, in *Ancient Geography*. See SEBOIM.

ZEBRA, in *Zoology*. See EQUUS Zebra.

ZEBU, a name given by M. de Buffon to a variety of the bos taurus of Linnæus, or bison of other writers, or the camel. This variety resembles the Indian ox, or bos Indicus, but is extremely small, being found in some parts of India of a size scarcely larger than a great dog. In colour it differs like the common cattle, being either grey, brown, white, &c., or variously spotted. The Indian ox, which is found in many parts of India, as well as in the Indian and African islands, and particularly in Madagascar, is of a reddish colour, of a very large size, and is distinguished by a very large protuberance over the shoulders.

ZEBU, in *Geography*. See SIBU.

ZEBULUN, or ZABULON, in *Scripture Geography*, one of the Jewish tribes in Lower Galilee, on the S. of the tribes of Apher and Naphtali, having the Mediterranean on the W., the sea of Galilee on the E.; separated on the N. from Apher by the river Jephthael, and on the S. from Issa-

char by that of Kishon. Its ports, on account of its vicinity to the sea, were numerous, and its commerce extensive. Its cities were, Zebulun the capital, Bethsaida, Magdalen, Joppa, Jotapa, Cinnereth, (since Tiberias, on the lake of that name,) Cartha, Bethulia, Rimmon, Dothaire, Danna, Sommeron, Tabor, both the city and mount, Sopha, Saffa or Siporis, Nazareth, Cana the lesser, commonly called Cana of Galilee, Iconium, and Sicaminum or Porphrem, anciently Hiepha, or Ceipha, situated northwards at the foot of mount Carmel.

ZEBULUN, or *Zabulon*, the capital of the fore-mentioned tribe, situated on the Mediterranean, near the mouth of the Jephthael, and once styled Zabulon Andron, or of men, on account of its extraordinary populousness. It was adorned with fine buildings, after the manner of Tyre, Sidon, and Berytus, and much admired on that account by Cestius, the Roman general, who nevertheless took, plundered, and burnt it to the ground. In the early ages of Christianity it was the see of a bishop, but now it is a poor place, in ruins.

ZECARIAH, or the *Prophecy of Zechariah*, in *Biblical History*, a canonical book of the Old Testament.

Zechariah was contemporary with Haggai, and prophesied in the second year of Darius Hytaspes. The design of the first part of this prophecy is the same with that of Haggai, viz. to encourage the Jews to go on with rebuilding of the temple, by giving them assurance of God's assistance and protection: from whence the author proceeds to foretel the glory of the Christian church, the true temple of God, under its great high priest and governor, Jesus Christ, of whom Zerubbabel and Joshua the high priest were figures. The latter part of the prophecy, from chap. ix., probably relates to the state of the Jews under the Maccabees, and then foretels the rejection of the Messiah, and some remarkable incidents that should happen to them in the latter ages of the world.

Mr. Mede, and some other learned men, think, that the 9th and following chapters of Zechariah are parts of the prophecy of Jeremiah.

ZECHIN, or **ZECCHINO**, in *Commerce*. See **SEQUIN**.
ZECHINI, in *Geography*, a small island in the Grecian Archipelago; 2 miles S.E. of Stanchio. N. lat. 36° 43'. E. long. 26° 51'.

ZECHLIN, a town of Brandenburg, in the mark of Prgnitz; 9 miles E. of Wittstock.

ZEDIC, a town of Africa, capital of a district in Tripoli, situated in a bay of the Mediterranean, called the bay of Zedic; 150 miles E.S.E. of Tripoli.

ZEDLISCHT, a town of Bohemia, in the circle of Pilsen; 5 miles N.W. of Hayd.

ZEDOARY, **ZEDOARIA**, or *Kempferia Rotunda* of Woodville, or *Curcuma Zerumbet* of Dr. Roxburgh, in the *Materia Medica*, a medicinal root, belonging to a plant growing in the East Indies (the *amomum Jacqo nudo, spica laxa truncata*, of Berg. Mat. Med.), whose leaves are like those of ginger, only longer and broader.

The *Curcuma Zedoaria* of Dr. Roxburgh, with small bulbs, and with the long palmate tubers inwardly yellow, leaves broad lanceolar, subsessile on their sheaths, sericeous underneath, and the whole plant green, is the *AMOMUM Zedoaria* of Linnæus and Willdenow; which see. It is a native of various parts of India; flowers during the hot season, April and May, when the plant is destitute of leaves: soon after they appear. The dry root, it is said, agrees pretty well with the drug known in England by the name of zedoaria rotunda. The Sanskrit name implies that the drug is used as an antidote to poison.

The *Curcuma Zerumbet* of Roxburgh, with small bulbs, and palmate tubers pale straw-colour; leaves green-petioled, broad-lanceolar, with a purple cloud down the middle; and flowers shorter than their bractæas, is the *AMOMUM Zerumbet* of Retzius; which see. This is a native of various parts of India, and its flowering-time the hot season, before the leaves appear. The pale colour of the roots, crimson coma, and ferruginous mark down the centre of the leaves, which is a constant mark in this elegant species, readily point it out from every other. The dry root appears to be the zedoaria of the shops in England. See *Asiatic Researches*, vol. ii. p. 332—334.

The root is brought over in oblong pieces, about the thickness of the little finger, and two or three inches in length; or in roundish ones (the *zerumbet* of the Paris Pharmacopœia), about an inch in diameter; it is of an ash colour on the outside, and white within. The difference of these, in strength, if any, is very inconsiderable, and therefore the college allows both to be used indiscriminately.

This root has an agreeable camphoraceous smell, and a bitterish aromatic taste. It impregnates water with its smell, a slight bitterness, a considerable warmth and pungency, and a yellowish-brown colour: the reddish-yellow spirituous tincture is in taste stronger, and in smell weaker, than the watery. In distillation with water, it yields a thick, ponderous essential oil, smelling strongly of the zedoary, in taste very hot and pungent; the decoction, thus deprived of the aromatic matter, and concentrated by inspissation, proves weakly and disagreeably bitter and sub-acrid. A part of its odorous matter rises also in the inspissation of the spirituous tincture; the remaining extract is a very warm, not fiery, moderately bitter aromatic, in flavour more grateful than the zedoary in substance.

Zedoary-root is a very useful warm stomachic; and has been commended in colics and hysterical affections, for promoting the menses, &c. It has been employed by some as a succedaneum to gentian root; but from the above analysis it appears to be not entirely similar to that simple bitter; its warm aromatic part being the prevailing principle, in virtue of which its spirituous extract (the most elegant preparation of it), has been made an ingredient in the cordial confecton of the London Pharmacopœia. Lewis's Mat. Med.

Carthener, who ascribes its virtues to a camphoraceous volatile oil, considers it as a general remedy for most of the chronic diseases with which human nature is affected; but as the camphor contained in it can avail but little, and its effects as a bitter or aromatic are so very inconsiderable, this root is now deemed to possess very little medicinal power, and might be safely expunged from the *materia medica*. Cullen. Woodville.

The zedoary wash, which is a cooler yellow than saffron, though full as bright, and valuable for many purposes in painting with water-colours, may be prepared by boiling an ounce of the root in a quart of water, till the water is sufficiently tinged to make a stain on paper, of a full yellow colour; and straining the liquor through a linen filtre. This wash may be dried in shells, and will again dissolve and spread kindly with the addition of water.

ZÉEDLITZ, in *Geography*, a town of Silesia, in the principality of Neisse; 3 miles N. of Ottmichau.

ZEFERDEN. See **SUFFERDAM**.

ZEFR, a word by which some of the chemical authors express pitch.

ZEFRIÒ, in *Geography*, a mountain of Naples, in Calabria Ultra; 10 miles N.N.E. of Bova.

ZEGEDIN, or **SZEGED**, a town of Hungary, near the conflux of the rivers Maros and Theisse. It is strong, and a place

a place of some trade, particularly in cattle. In the year 1503, all its defence was a moat and rampart; but falling some time after into the hands of the Turks, they erected a brick fort. In 1686, the Imperialists dispossessed the Turks of it; 68 miles N. of Belgrade. N. lat. $46^{\circ} 15'$. E. long. $19^{\circ} 56'$.

ZEGGO, a town of Africa, in the country of Melli, in the road from Kong to Caffina; 100 miles N.N.W. of Malel. N. lat. 14° . E. long. 8° .

ZEGHAMA, a town of Dar-Fur; 60 miles N. of Cobbé.

ZEGHEN, a town of Fezzan; 65 miles N. of Mourzouk.

ZEGI, ZAGI, a word used by Avicenna and others to express all the several vitriolic minerals. See **CHALCITIS**, and **COLCOTHAR**.

ZEGMA, in *Geography*, a town of Asiatic Turkey, in the province of Diarbekir, on the Euphrates, opposite to Romkala.

ZEGUTI, a town of Imiretia; 20 miles S.W. of Cotatis.

ZEGZEG, a city of Africa, and capital of a country of the same name, situated to the east of Agades; 370 miles N.N.E. of Caffina. N. lat. $20^{\circ} 45'$. E. long. 16° .

ZEHDENICK, a town of Brandenburg, in the Ucker Mark, on the Havel. In it is a convent for ladies of noble descent, consisting of a domina and six sisters. It carries on a large trade in wood and corn: in the pastures, near the town, iron-ore is met with in great abundance, and accordingly there is a mill here for that purpose, which is driven by the Havel. At this place likewise is a foundery, where bombs, grenades, bullets, mortars, pots, weights, and even small cannon are cast; 28 miles S.S.W. of Prenzlau. N. lat. $52^{\circ} 58'$. E. long. $13^{\circ} 22'$.

ZEH DIN, a town of Brandenburg, in the New Mark; 40 miles E. of Oderberg.

ZEHERECH, a word used by some of the chemical writers to express flowers of bræs.

ZEHISTA, in *Geography*, a town of Saxony, in the margravate of Meissen; 3 miles S. of Pirna.

ZEHRENDORF, a town of Brandenburg, in the Middle Mark; 3 miles S. of Zossen.

ZEIDURE, a district of Algiers, between Tremecen and Oran.

ZEIL, a town of Bavaria, in the bishopric of Bamberg; 12 miles W.N.W. of Bamberg. N. lat. $50^{\circ} 1'$. E. long. $10^{\circ} 40'$.—Also, a town and castle of Germany, which gives name to a county; 4 miles N. of Leutkirch.

ZEILA, or **ZELLA**, or **Seja**, a sea-port town of Africa, in the kingdom of Adel, situated on the coast of the Arabian sea, at the mouth of the Hanazo, or Hawaf, which forms a bay, called the Bay or Gulf of Zeila. It receives a governor from the dola of Mocha. N. lat. $10^{\circ} 45'$. E. long. $44^{\circ} 20'$.

ZEILSHEIM, a town of the duchy of Wurzburg; 4 miles N. of Volckach.—Also, a town of the duchy of Wurzburg; 4 miles E.N.E. of Arnstein.

ZEINDEROOD, or **ZENDEROD**, a river of Persia, in the province of Irak, which has its source in the Kohizard, or Yellow mountain, where an aqueduct may yet be seen, by which Abbas the Great attempted to unite its waters with those of the Karoon. The Zeinderood passes through the city of Ispahan, and is said to be absorbed in the irrigation of the neighbouring territory, or to lose itself in a lake, 15 miles S.W. of Lauritan. On this river are three bridges, two of which are in good repair; particularly that of the Char Baug (four gardens), so called

from its connecting the upper and lower Chau Baug, the name given to a spacious avenue, which runs from the royal square to the foot of the mountains E. of Ispahan.

ZEISELMAN, a town of Austria; 3 miles E. of Tulln.

ZEISPERG, a town of Austria; 3 miles E.N.E. of Crems.

ZEITHAYN, a town of Saxony, in the margravate of Meissen, famous for a pleasure-camp which king Augustus II. made there, in 1730, at the expence of five millions of six-dollars. On the spot which was used for this camp, and the exercising of the army, are erected six large pyramids; and medals have likewise been struck upon it, and a grand representation thereof engraved on copper; 8 miles W.N.W. of Grossenhayn.

ZEITLOSS, a town of the duchy of Wurzburg, on the river Sinn; 10 miles N. of Gmunden.

ZEITON, a town of European Turkey, in Thessaly, on a gulf to which it gives name. Here are about 400 Christian families, but the greater part of the inhabitants consists of Turks; 48 miles S.E. of Larissa. N. lat. $39^{\circ} 6'$. E. long. $22^{\circ} 58'$.

ZEITON, a gulf or bay of the Egean sea, on the E. coast of Thessaly, N.W. of the island of Negroponte.

ZEITOUN, a town of Persia, in the province of Fars or Farifan, containing about 2000 inhabitants, and situated in a pleasant valley, fertilized by both the branches of the river Tab, which here form a junction. Zeitoun is about fifteen miles distant from Behaban, the capital of the mountainous district of Khogifsea, which extends from the valley of Ram Hormuz to the vicinity of Kazeroon.

ZEITOUN, a town of Asiatic Turkey, in the government of Sivas, on the Kizilermak; 33 miles W. of Samfoun.

ZEITRABRA, a term used by some of the chemists to express any thing that is fluxile.

ZEITZ, in *Geography*, a town of Saxony, in the bishopric of Naumburg, anciently the see of a bishop, founded by the emperor Otho I. afterwards transferred to Naumburg, after this town had been sacked and almost destroyed by the Vandals in the year 982; 15 miles E.S.E. of Naumburg. N. lat. $51^{\circ} 3'$. E. long. $12^{\circ} 2'$.

ZEKELHEIB, a town of Hungary; 8 miles N.N.W. of St. Job.

ZELA, a town of Persia, in the province of Segestan; 25 miles S.W. of Ferah.

ZELA, ZIELA, or **Zeleja**, in *Ancient Geography*, a town of Thrace, afterwards called Flaviopolis.—Also, a town of Asia, in Cappadocia Pontus, near the Lycus. It was celebrated by the defeat of Triarius, the Roman general, and afterwards by that of Pharnaces. Here was a famous temple, represented upon some medals, consecrated to the goddess Anakis, a Persian divinity, whose pontiff was very powerful under ancient kings; but in process of time his authority and revenues were diminished. The town and the ministers of the temple were dependent on Pithodiris, who possessed a part of the territory; other parts were ceded to the pontiffs of Zela and Comanes, and the rest was annexed to the Roman province. According to Strabo, Zela and its territory were situated to the left of the river; the sacred lands of the temple, and the domains of the pontiff, were in the environs of the town. He adds that it was fortified and built in the retrenchment of Semiramis; and in the first times it had only some houses near the temple; but Pompey made it a town.

ZELAH, or **SELA**, a city of Benjamin (Josh. xviii. 28.), where Saul was buried in the tomb of his father, Kish. 2 Sam. xxi. 14.

ZELAN, in *Geography*, a mountain in the county of Tyrol; 20 miles N.E. of Trent.

ZELANDY, a small island in the East Indian sea, near the W. coast of Sumatra. N. lat. $0^{\circ} 53'$. E. long. $98^{\circ} 14'$.

ZELANICA, a cape on the N. coast of Nova Zembla. N. lat. 78° . E. long. $77^{\circ} 24'$.

ZELATE, a town of the country of Candahar; 30 miles N.E. of Candahar.

ZELBI. See SCHELEBY.

ZELEEFA, a town of Africa, in the country of Tunis; 10 miles S.E. of Cairoan.

ZELEH, a town of Asiatic Turkey, in the government of Sivas, anciently a town of Pontus, and called Zela. Near this place the Romans, under Triarius, were defeated by Mithridates; and Pharmaces, son of Mithridates, was afterwards defeated by Julius Cæsar; 21 miles W.S.W. of Tocat. See ZELA.

ZELEIA, in *Ancient Geography*, a town built, according to Homer, at the foot of mount Ida. It was watered by the Tarsius, and had to the S. the lake Aphnitis. According to Strabo, it had also in ancient times an oracle, but in his time it was not consulted.

ZELEM, in the *Materia Medica of the Ancients*, a name given by Avicenna and others to a fruit common in Africa in their time, and much esteemed by the people of that country, and called there by some *piper nigrorum*, the black people's pepper, or negro-pepper.

Avicenna tells us, that the zelem was a fattish seed, of the size of a chich, and of a high flavour, in colour yellow on the outside, and white within, and that it was brought from Barbary.

He adds, that there is another plant, properly called *fulful alsuaden*, that is, *piper nigrorum*. This, he says, was a seed contained in pods like kidney-beans, and was black, and of a pungent and acrid taste.

ZELENIN, in *Geography*, a small island in the Frozen ocean, near the S.W. coast of Nova Zembla. N. lat. $70^{\circ} 50'$. E. long. $56^{\circ} 24'$.

ZELENOIKOLOK, a fort of Russia, in the government of Caucasus, on the Ural; 44 miles N. of Guriev.

ZELÉS, in *Ancient Geography*, a town of Hispania, in Bætica, upon a strait which separated Hispania from Africa, according to Strabo. This author reports, that the Romans transported the inhabitants into Mauritania, together with others drawn away from Tingis, established the town of Julia Joga.

ZELETAWA, in *Geography*. See SCHELETA.

ZELEZENSKAIA, a fort of Russia, in the government of Kolivan, on the E. side of the Irtisch. N. lat. $53^{\circ} 25'$. E. long. $75^{\circ} 40'$.

ZELITO, or ZILITO, a fort of South America, in the harbour of Carthagena.

ZELL, a town of Austria; 14 miles N.N.W. of St. Wolfgang.—Also, a town of Bavaria, in the bishopric of Bamberg; 10 miles W. of Bamberg.—Also, a town of Germany, in the principality of Culmbach; 12 miles S.S.W. of Hof.—Also, a town of the duchy of Wurzburg; 3 miles N. of Schweinfurt.

ZELL. See LIEBENZELL.

ZELL im Ham, a town of Germany, on the Moselle; 25 miles N.E. of Treves. N. lat. $50^{\circ} 4'$. E. long. $7^{\circ} 7'$.

ZELL in the Pizgau, a town of the archbishopric of Salzburg, on the Zeller See; 30 miles S.S.W. of Salzburg.

ZELL in Zillertal, a town of the archbishopric of Salzburg, on the Zeller; 50 miles S.W. of Salzburg.

ZELL am Hammerbach, a town of Germany, situated in the vale of Hammerbach. The town was imperial, and

afflicted twenty-one florin till 1802, when it was given to the margrave of Baden; 9 miles W. of Freudenstadt. N. lat. $48^{\circ} 23'$. E. long. $8^{\circ} 7'$.

ZELLA, in *Ancient Geography*, a town of Africa, which was ruined during the war of Cæsar against Scipio. Strabo.

ZELLANG, in *Geography*, a town on the W. coast of the island of Celebes. S. lat. $4^{\circ} 20'$. E. long. $120^{\circ} 3'$.

ZELLE, or ALTENZELLE, a town of Saxony, in the circle of Erzgebürg; 2 miles W. of Nossen.

ZELLE, a city of Westphalia, in the principality of Luneburg. This is a fortified and well-built town, situated on the Aller, which is here navigable, and behind the New Town is joined by the Fuhsee. The town itself, in conjunction with the suburb of Fritzenweife, consists of 564 houses; but including the other suburbs, summer-houses, and buildings without the gates, the number of them amounts to about 1400. At this place was held the high court of appeals for the several territories of the electoral house of Brunfwick-Luneburg, together with the chancery and chief tribunal of the principality of Luneburg. Here also stands the provincial house for the diets of the principality, together with one of its superintendencies, and a special superintendency which is administered by the general superintendant, who is always first minister of the town church. The other public edifices in it are, the Guildhall, the riding-house, the mews, and the armoury. The magistracy is possessed of the lower jurisdiction in the town, and likewise in some parts of the suburbs. At this place, too, are manufacturers and artificers in various branches, particularly in gold and silver. The prince's seat, near the town, is walled and moated in, and was the residence of the Zelle line of Brunfwick-Luneburg, which failed in 1705. It was built by duke Henry, in the year 1485, and afterwards improved; 40 miles S. of Luneburg. N. lat. $53^{\circ} 42'$. E. long. $10^{\circ} 14'$.

ZELLENBERG, a town of France, in the department of the Upper Rhine; 9 miles N. of Colmar.

ZELLER SEE, a lake of Germany, in the archbishopric of Salzburg; 28 miles S.S.W. of Salzburg.

ZELLERFELD, a town of Westphalia, in the Harz Forest; silver to the value of 20,000 imperial crowns is annually coined in this town; 6 miles S.S.W. of Goslar.

ZELLERNDORFF, a town of Austria; 3 miles S.E. of Schrottenthal.

ZELLHOFEN, a town of Austria; 10 miles N.W. of Grein.

ZELLIA, in *Ancient Geography*, a country of Upper Pannonia, inhabited by the Slavi.

ZELLIN, in *Geography*, a town of the New Mark of Brandenburg; 13 miles N.W. of Cutrin.

ZELLINGEN, a town of the duchy of Wurzburg; 8 miles N. of Wurzburg.

ZELLITZ, a town of the duchy of Stiria; 8 miles W. of Marburg.

ZELON, a town of Thibet; 27 miles S.W. of Lassa.

ZELOTTI, BATTISTA, in *Biography*, was born at Verona in 1532. He was a pupil of Titian, according to Vafari, and a fellow-student with Paolo Veronese, with whom he co-operated in several important works at Venice. He particularly excelled in fresco, and that induced Paolo to court his assistance in many of the great works in which he was engaged. In consequence many of his works are given to Veronese, and those in the hall of the Council of Ten, in the palazzo S. Marco, have been engraved by Le Febvre as the works of that master. His picture of the Holy Family, in the Carara collection, is painted with the strength and warmth of Titian, and others of his works in

oil are deservedly esteemed and admired, particularly the Conversion of S. Paul, and Christ with his Disciples in the Fishing-boat, in the cathedral at Vicenza. He fell short of the grace and taste of Veronese, yet his invention was not lacking in energy; his touch is free and animated, and his compositions managed with skill and judgment. He died in 1592, aged 60.

ZELPHI. See ZENDA.

ZELPITSCH, in *Geography*, a town of Istria; 10 miles N.E. of Mitterburg.

ZELTURINSKOI, a fort of Russia, in the government of Irkutsk; 72 miles S.S.E. of Tunginkoi.

ZELUIA, a town of Lithuania, in the palatinate of Novogrodek; 25 miles N.W. of Slonim.

ZEM, a river of Albania, which runs into the Moraca, 12 miles W. of Cattaro.

ZEMA, a word used by many of the old writers for a decoction or apozem.

ZEMARAIM, or SEMARAIM, in *Ancient Geography*, a city of Benjamin near Bethel. Josh. xviii. 22.

ZEMARITES, an ancient people of Syria, mentioned by Strabo, who places them on a plain, two leagues to the N. of mount Libanus, and gives them the term of Simyra.

ZEMASARUM, a word used by some of the chemical writers as a name for cinnabar.

ZEMBLA, NOVA, *Novaya Zemlia*, or *New Land*, in *Geography*, a Russian island, or rather a group of five islands, with the intervening channels always filled with ice, situated in the Frozen or Northern ocean. Of the numerous islands in this ocean, *Novaya Zemlia* and *Kalgeva* are the most considerable; but both are uninhabited, and frequented only by fishermen and hunters. The former is indeed well supplied with water; but is rocky, unfertile, and destitute of wood, furnishing vegetation only for a few stunted bushes and polar plants. It abounds, however, with rein-deer, white bears, and blue foxes; and the shores swarm with morfes, walruses, and various kinds of fish. Its magnitude is estimated at 950 versts in length, 520 in breadth, and 3090 in circumference, without following the sinuities, and 425,509 German miles of superficies, according to Mr. Storch. On the northern side it is entirely encompassed with ice mountains; and to the south is the sea of Cara, Kara, or Karlkoge, in which the tide flows about two feet nine inches. Among the lakes of this island there is one of salt water. From the middle of October till February the sun is not at all visible; but they have the advantage of numerous and strong north-lights and of much moon-light. In summer they have no thunder-storms. The snow falls in many places to the depth of four arshins. For two months, viz. June and July, the sun never sets. Between this island and the main land is the famous passage known by the name of Vaggat's or Waygat's straits.

ZEMECH, a word used by some writers as a name for *lapis lazuli*.

ZEMENIE, in *Geography*, a town of European Turkey, in Romania; 16 miles S.W. of Gallipoli.

ZEMIA, Ζημία, among the Athenians, is sometimes taken in a large and general sense for any kind of punishment; but more frequently for a pecuniary mulct or fine laid upon the criminal, according to the degree of his offence.

ZEMLIANSK, in *Geography*, a town of Russia, in the government of Voronez; 44 miles N.N.W. of Voronez. N. lat. 52° 12'. E. long. 38° 42'.

ZEMLIN, or SEMLIN, a fortress of Slavonia, at the union of the Save and the Danube, opposite Belgrade. Here is a lazaretto, where travellers and merchandise from the Levant are detained to prevent infection. The number

of inhabitants is about 1200 Rascians, Greeks, Jews, Armenians, and Turks: during a fire at Zemlin, Joseph II. emperor of Austria, assisted in person to suppress it.

ZEMME, a town of Grand Bucharia, on the Gihon; 60 miles S. of Bucharia.

ZEMOKARTLI, a town of Turkish Armenia, in the government of Cars; 50 miles N. of Ardanoudji.

ZEMORGET, or ZERMOGETE, a small island in the Red sea, 30 miles from the coast of Egypt. This island was called by the ancients "Ophiodes," from the abundance of serpents, and the island of topazes from the number of those precious stones found there. N. lat. 23° 25'. E. long. 53° 5'.

ZEMOVAN, a town of Pegu; 50 miles S. of Prone.

ZEMPHYRUS, in the *Materia Medica of the Ancients*, a name give to a precious stone, the fragments of which they use as a cordial and sudorific.

It appears by their accounts, that this stone was blue; and hence many have too hastily judged, that it was the lapis lazuli; but in truth it was the sapphire.

The word *zemphyrus* is no where used but in the writings of the later Greeks, and it is plainly formed, as most of their names of things are, on the Arabian word expressing the same thing. This Arabian word is *semphir*; and this, in Avicenna and Serapio, is always used as the name of a sapphire, never as that of any other gem. We find also by their accounts, that this sapphire was not the sapphire of the ancient Greeks, but the fine blue pellucid gem we now know by that name; for the sapphire of Theophrastus, and the other old writers, was only a kind of lapis lazuli.

ZEMPLIN, in *Geography*, a town of Hungary; 16 miles N.E. of Patak.

ZEMPOALA. See ZAMPALA.

ZEMZEM, the holy well of Mecca, which see.

ZENANICH. See SELANIEH.

ZENATI, a river of Algiers, formed by the union of two streams, which soon after changes its name to Seiboufe.

ZENDA, a general term coined by Paracelsus, by which he and his followers express extraneous or equivocal generation, or the production of bodies without a feminal principle. The word *zerunda* is used to express this particular sort of generation of men, and *zelpi* in regard to other animals.

ZENDAVESTA, by contraction *Zend*, and, as it is vulgarly pronounced, *Zundavestow* and *Zund*, in *Antiquity*, denotes the book ascribed to ZOROASTER. (see his article,) and containing his pretended revelations; and which the ancient Magians and modern Persees, called also Gauris, observe and reverence in the same manner as the Christians do the Bible, and the Mahometans the Koran, making it the sole rule of both their faith and manners. See MAGI, PERSEES, GEBRES, &c. See also GENTOOS.

The word, it is said, originally signifies any instrument for kindling fire, and is applied to this book to denote its aptitude for kindling the flame of religion in the hearts of those who read it.

Zendavesta is compounded of *Zend*, denoting the letters of the book, and *Avesta*, signifying the language in which it was written. See PERSIA, *Language of*.

M. Anquetil du Perron, to whose account we shall refer more at large in the sequel of this article, has taken pains, in the 37th volume of the work cited below, to prove that Zoroaster lived under Hytaspes, the father of Darius, in the sixth century before Christ.

The Zendavesta, or *Zend*, contains the system of doctrine and duty, which is said to have been supernaturally communicated

municated to Zoroaster, and which his followers hold in very extraordinary veneration. A copy of this book is kept, says Dr. Prideaux, to this day in every oratory and fire-temple, and portions of it are read at stated times by the priests to the people: and to this they appeal as the standard of the good and evil of their actions. This work, ascribed among other numerous writings to Zerdusht, or the Persian Zoroaster, and esteemed by his followers as of sacred authority, is said to have been written in the Persian language, and to have consisted of two parts; one of which contains their forms of devotion and order of ceremonies, the other the precepts of religion and morality. A compendium of it, called the *Sadda* or *Sadder*, is read to the people on every sacred day by their priests. There is, however, much reason to question, whether this book be of such ancient date as the time of Zoroaster; and it has been suggested as probable, that it was written about the time when many Jews and Christians resided among the Persians; that is, about the 4th or 5th century. In proof of its being later than the time of Zoroaster, but written since the days of Mahomet, it is alleged, that the word *shaitan* occurs in it, which is peculiar to the Arabs; for in other oriental languages it is written *sham*, or *sham*.

Dr. Hyde gives us the following account of it. The *Zend* is the general name of the book, which is also called the book of Abraham; and it consists of twenty-one or twenty-two separate parts, with distinct names. Its contents were originally written on twelve hundred skins; and the ancient copies of it, like the original, are in the pure old Persian language; but the later copies are in the same language, mixed with modern Persian or Arabic words, serving to explain such as were becoming obsolete. Some parts of the *Zend* contain the original text, and others contain Zerdusht's second thoughts subjoined, for more fully explaining his doctrine. Some writers suggest, that Zerdusht first intended to comprise his book in four parts, *viz.* the *Zend*, containing the liturgy and chief doctrine of his religion, and the *Pazend*, or commentary upon the former; and that the farther additions were occasioned by the opposition of adversaries, and unforeseen circumstances that occurred. The character in which the *Zend* is written is that of the old Persian, called Pehlavi; and the *Pazend* character differs in a small degree from this.

Dr. Hyde has given a catalogue of the several parts of the *Zend*, each of which is called *nosb* or *nusb*.

In process of time, when the old Persian language became antiquated, and little understood, one of their deacons or bishops (about A.D. 1500) composed the *Sadda*, which is a compendium, in the vulgar or modern Persian tongue, of those parts of the *Zend* that relate to religion, or a kind of code of canons and precepts, drawn from the theological writings of Zoroaster, serving as an authoritative rule of faith and practice for his followers. This *Sadda* is written in a low kind of Persian verse, and, as Dr. Hyde informs us, it is *honorum et malorum sarrago*, having many good and pious things, and others very superstitious and trifling.

The *Zend* contains a reformed system of Magianism; teaching that there is a Supreme Being, eternal, self-existent, and independent, who created both light and darkness, out of which he made all other things; that there are in a state of conflict, which will continue till the end of the world; that then there shall be a general resurrection and judgment; and that just retribution shall be rendered unto men according to their works; and that the angel of darkness with his followers shall be con-

signed to a state of everlasting darkness and punishment, and the angel of light with his disciples introduced into a state of everlasting light and happiness; after which light and darkness shall no more interfere with each other. The *Zend* also enjoins the constant maintenance of sacred fires and fire-temples for religious worship, the distinction of clean and unclean beasts, the payment of tithes to priests, which are to be of one family or tribe, a multitude of washings and purifications, resembling those of the Jewish law, and a variety of rules and exhortations for the exercise of benevolence and charity.

Dr. Prideaux charges the *Zend* with allowing the worst kind of incest; and Dr. Hyde also intimates that it was allowed by Zoroaster, till it was at length abolished; but no authority has been cited to justify this charge.

The above-mentioned doctrines of the *Zend* are accommodated to the eastern taste by a great intermixture of fable.

In this book there are many passages evidently taken out of the Scriptures of the Old Testament, particularly out of the Psalms of David: the author represents Adam and Eve as the first parents of all mankind, gives in substance the same account of the Creation and Deluge with Moses, differing indeed with regard to the former by converting the six days of the Mosaic account into six times, comprehending in the whole three hundred and sixty-five days; and speaks also of Abraham, Joseph, Moses, and Solomon. Moreover, Dr. Baumgarten (Univ. Hist. Suppl. vol. ii. p. 367, &c.) asserts, that this work contains doctrines, opinions, and facts, actually borrowed from the Jews, Christians, and Mahometans; whence, and from other circumstances, he concludes, that both the history and writings of this prophet were probably invented in the later ages, when the fire-worshippers under the Mahometan government thought fit to vindicate their religion from the suspicion of idolatry.

The Zoroaster, says the abbé Foucher, (see ZOROASTER,) who was the author of the *Zend*, is represented by him as an apostate Jew, a subtle philosopher, and an obsequious artful courtier, who insinuated himself into the favour of Darius Hytaspes; and he says that his great design was to reconcile the Hebrew with the Persian religion by a mixture of the leading and essential doctrines of each, to revive the credit of the Magi, and to accommodate, by a proper colouring, the Jewish religion to the weakness and prejudices of the Medes and Persians, by taking from it that exclusive character that rendered it offensive to other nations, and mixing with it the reveries and visions of the ancient Zoroaster. See Hyde's *Religio Veterum Persarum*. Prideaux's *Conn. of the Old and New Testament*, vol. i. p. 317, &c. edit. 9. Univ. Hist. vol. ii. p. 206, &c. fol.

The account more lately given both of the Perses and *Zend*, by M. Anquetil du Perron, differs in several particulars from that of Dr. Hyde. This gentleman made a voyage to India, and employed himself between the years 1755 and 1761 in studying the Persian and Sanskrit languages, and in collecting and translating manuscripts, many of which he brought with him, and deposited in the king of France's library. His account was read to the Royal Academy of Sciences at Paris, and a translation of it was published in the *Gentleman's Magazine* for 1762, and also in *Dodley's Annual Register* for 1762, part ii. p. 101—127. Of the Perses or Parthes, the disciples of Zoroaster, he says, a very numerous body has been established more than nine hundred years in Guzerat, to which place they came fugitives from Kerman, A.D. 767, on account of the Ma-

U hometan

ZENDAVESTA.

hometan persecutions, where their genius for commerce and industry, which are their known characteristics, procured for them very considerable settlements. Concerning the hierarchy of the Parfles, this writer observes, that their ministers of religion are divided into five classes, *viz.* erbeds, mobeds, destours, destour mobeds, and destouran destours, or destours of destours. An erbed is a person who has submitted to the purification directed by the law, who has read, during four days without interval, the Izechné and the Vendidad, and who is instructed in the ceremonies of the worship established by Zoroaster. If the erbed afterwards continues to read publicly the Zend works, which constitute the liturgy, and to perform the ministerial functions, he becomes a mobed, though he does not understand the Zendavesta; but if he contents himself with studying the law, the Zend, and the Pehlvi, or Pehlvi, without exercising the ministerial functions, he is called a destour.

The destour mobed is he who unites the qualifications of the mobed and destour; and the destouran destour is the principal destour of a city or province, who decides cases of conscience, and determines points of law, and to whom the Parfles pay a tithe of their revenues.

As for those Zend writings, which the Parfles attribute to their legislator, and for which they have the same veneration as the Jews have for their Hebrew text, M. du Perron inclines to think, though he does not affirm, that they are really the works of Zoroaster, whose reputation has been acquired by laws that have subsisted two thousand five hundred years.

The law, which was either framed or regulated by Zoroaster, was divided, as we are told by modern authors, into twenty-one nohs, or parts: seven treat of the creation and history of the world; seven of morality, and civil and religious duties; and seven of physic and astronomy. Among the Parfles it is an universally received tradition, that Alexander the Great condemned these twenty-one volumes to the flames, after having caused them to be translated into Greek. Those which escaped are, the Vendidad, the Izechné, the Vispered, the Jestscht, and the Neafschs, in Zend, and some other Pehlvi translations of Zend originals. The Parfles have also a great number of prayers, which they call nerengs, and which in general are written in modern Persian, with Zend characters, which they affect to use in all writings that treat of religion, though composed in modern Persian. The writings of Zoroaster, which still remain, speak of the creation of the universe, of the terrestrial paradise, and the dispersion of mankind; of the cause of the respect paid to fire, of the origin of evil, natural and moral; of the angels appointed to the government of the universe; of several particulars relating to the end of the world, and the resurrection, &c. &c. They also contain predictions with respect to the latter times, some excellent moral precepts, and a very extensive ceremonial code.

The Zend, according to Du Perron, is not the name of Zoroaster's writings, but merely of the characters, though generally used to signify the language itself, in which they were written: the language of the original text is called Avesta, and is a dead language, and was entirely unknown to the Parfles before the time of Zoroaster, who, he apprehends, brought it from the mountains; and is totally different from the Pehlvi or ancient Persian, spoken in the time of Zoroaster. He farther supposes, that the works of Zoroaster, still extant in the Pehlvi, were translations made into that language during the life of this legislator, or soon after his death.

The Pazend, which Dr. Hyde makes to be the name of a work, is, according to Du Perron, the name of a language, which is a dialect or corruption of the Avesta, and almost extinct, except that a few words of it are preserved in the Pehlvi translation. The characters of the Avesta and Pehlvi are different; the former, which are properly the Zend letters, being much the neatest; the Pazend has no peculiar alphabet, but adopts that of the Zend or Pehlvi indifferently. (On this subject, see *Language of PERSIA*.) For M. du Perron's account of the eighteen MSS. of which he brought duplicate copies with him, and an abstract of their contents, we must refer to the *Ann. Reg. &c. ubi supra*.

This writer has published a translation of the Zendavesta, with remarks and illustrations, &c. in 3 vols. 4to. at Paris, in 1771.

The Zend, as fir W. Jones suggests (Works, vol. iii. p. 115, 8vo.), bore a strong resemblance to Sanskrit, and the Pehlvi to Arabic, being a dialect of the Chaldaic. Sir W. Jones, from a perusal of two vocabularies, exhibited in this work, one in Zend, and another in Pehlvi, and derived from a collection of traditional pieces in modern Persian, was confirmed in his opinion concerning the Chaldaic origin of the Pehlvi; and in perusing the Zend glossary, he was surpris'd to find, that six or seven words in ten were pure Sanskrit. M. Anquetil, he says, most certainly, and the Persian compiler most probably, had no knowledge of Sanskrit, and could not therefore have invented a list of Sanskrit words: it must therefore be an authentic list of Zend words, which had been preserved in books or by tradition; and hence it follows that the language of the Zend was at least a dialect of the Sanskrit, approaching perhaps as nearly to it as the Pracrit, or other popular idioms which are known to have been spoken in India 2000 years ago. As soon as M. Anquetil published the above-mentioned work, fir W. Jones immediately discovered that the work was spurious, and by no means to be attributed to Zoroaster; in consequence of which he published in the same year, "Lettre à M. A—— du P—— dans laquelle est compris l'Examen de sa Traduction des Livres attribués à Zoroastre." This letter is contained in the 10th volume of his works, ed. 8vo. In Germany this version of M. Anquetil has met with more success, and has not only been translated into German, but applied to the purposes of explaining the New Testament. This use of it has been suggested by Michaelis, and exemplified in the illustration of the introduction to St. John's gospel, and particularly of the term "word," which is used in the Zendavesta in the same sense as by St. John and the Gnostics for the name of a person, and determines the proper translation of *λογος*. (Michaelis by Marsh, vol. i. p. 161.) Several other persons, besides fir W. Jones, have questioned the authenticity of the work which M. Anquetil has translated, or its being a genuine remain of Zoroaster.

Mr. Richardson, in his "Dissertation on the Language, Literature, and Manners of the Eastern Nations," originally prefixed to his Persian, Arabic, and English Dictionary, 1778 (chap. i. sect. 2.), is very severe, both on Dr. Hyde and M. du Perron. Those fragments of the supposed works of Zoroaster, which Dr. Hyde has given us under the title of *Sadders*, are, he says, the wretched rhymes of a modern Parsi destour or priest, who lived about three centuries ago; whilst the publications of M. Anquetil du Perron carry palpable marks of the total or partial fabrication of modern times. The Zend language, he says, is not genuine; and M. du Perron has produced no discovery which can stamp his publication with authority.

He adds, the specimens of old Persian in Hyde's *Religio Veterum*

Veterum Perfarum are simply modern language in ancient characters.

In the "Memoirs of the Royal Society of Gottingen for 1799," *i. e.* "Commentationes Societatis Regiæ Scientiarum Gottingensis, &c." we have a memoir by M. Christopher Meiners, who enters into a critical examination of the authenticity and antiquity of the books published by M. Anquetil du Perron, as genuine writings of Zoroaster; and alleges many plausible arguments to prove them recent and spurious. He shews, that they contain a multitude of fables, totally unknown to the ancient Persians, and contrary to the spirit of their laws and religion; and also many opinions and ceremonies, which had their first rise many ages after Zoroaster. The dissertations of professor Meiners, relating to the Zendavesta, are printed in the 8th volume of the *Novi Commentarii Soc. Reg. Gotting.*; and in the 1st and 3d volumes of the *Commentationes*.

Some have thought that the truths which are observable in Zendavesta, Vendidad Sadi, and other writings of the eastern nations, were derived from the disciples of Neotrius, who were found very early on the coast of Malabar. But this, Mr. Bryant thinks, is a groundless surmise; because the religious sects, among which these writings have been preserved, are widely separated, and most of them have no connection with Malabar or the Christians of that quarter. And besides, the Brahmins and Banians adhere closely to their own rites, and abhor all other persuasions; and they are influenced by customs and scruples, which prevent their intercourse with other people. In their writings there occurs no trace of Christianity, or of its founder; and thence Mr. Bryant infers, that whatever truths may be found in the writings of these people, they were derived from a higher source, and by a different channel. See *Anal. of Anc. Mythology*, vol. iii. p. 599, &c.

We shall terminate this article with adding, that Dr. Hyde presented the copy of part of the Zend writings in his possession to the university of Oxford; and that the whole Zend was afterwards brought from India by Mr. Frazer, and is lodged with his other oriental MSS. in the Radcliff library at Oxford.

ZENDERO, in *Geography*. See GINGIRO.

ZENDEROD. See ZEINEROD.

ZENDGIN SERAI, a town of Grand Busharia; 30 miles S. of Samarcand.

ZENDORFF, a town of the duchy of Stiria; 12 miles E. of Landberg.

ZENECHDON, a term used by the Arabian physicians for a preparation of arsenic, for external use; *zeech* being their name for arsenic.

ZENEXTOR, one of the many names by which the chemists have called mercury.

ZENGAN, ZENIGAN, or *Zinjan*, in *Geography*, a town of Persia, in the province of Irak, said to have been fortified many years before the Christian era, and at one time to have contained 20,000 houses. It was entirely destroyed by Timur Bec when he first passed through that part of Persia; but being informed that it had long been the seat of learning and science, on his return from Turkey he in part rebuilt it. Since that time it has been frequently sacked and destroyed by the Tartars and the Turks. It contained in the 17th century about 2000 houses. It is a large, and now apparently a prosperous town, capital of the extensive district of Khunifeh, which is 71 miles down an uneven country, full of deep ravines, from hence to the banks of the Kizilo-

zen, or golden stream, the natural boundaries of Irak and Azerbaijan; 21 miles N.W. by W. of Sultania.

ZENGH. See SEGNA.

ZENGHI, a river of Armenia, which runs into the Aras, 10 miles S. of Erivan.

ZENGIFUR, a word by which some of the chemical writers have expressed cinnabar.

ZENGIYZA, in *Ancient Geography*, a promontory of Africa, in Ethiopia, upon the gulf of Barbary. Ptolemy.

ZENGUIA, in *Geography*, a town of Syria, in the pachaic of Aleppo, on the Euphrates; 55 miles N.N.E. of Aleppo.

ZENHAGA. See ZANHAGA.

ZENI, a word used by many of the chemical writers as a name for vitriol.

ZENIC, or ZENIK, in *Zoology*, a species of weasel. See VIVERRA.

ZENICON, the name of a poison, composed of several ingredients, and used to poison the tips of the arrows with which the Celtic hunters shot at the beasts they pursued for food. The poison was known to be of that quick spreading nature, that as soon as the beast was fallen, the huntsman ran up to it, and cut out a large piece of the flesh about the wound immediately, to hinder the venom from spreading farther. The antidote to this poison was supposed to be the leaves of oak, beech, and other trees.

ZENIEH, in *Geography*, a town of Asiatic Turkey, in Caramania; 15 miles of Selsek.

ZENITH, in *Astronomy*, is derived from an Arabic word signifying *point*, and is that peculiar point in the visible celestial hemisphere, which, at a given time, is vertical to a spectator, situated on any part of the earth's surface, and from which, if a perpendicular line were demitted through the place of the spectator, it would proceed to the centre of the earth. Of all the points in the apparent concavity of the visible hemisphere, the *zenith point* is the most interesting; it is not only the pole of the local horizon of every place, and of all parallels of altitude, but is the point to which all the grand circles of the sphere are referred, and through which not only the great circles connecting the cardinal points, but all the circles of azimuth pass and intersect one another; and further, it is the only point in the celestial expanse that is not affected by atmospheric refraction. If the earth had no annual or diurnal motion, nor any nutation of its axis, the zenith of each place on the earth's surface would be so many fixed points in the heavens; but as none of these is the case, the actual zenith of every place, except over the two poles of the earth, is continually changing. The annual orbit of the earth is indeed so small in comparison of the distance of a star from it, that the parallax arising therefrom is too small to be appreciable with certainty even by the best instruments; but the effect of nutation of the earth's axis is very perceptible, as is also the aberration of light occasioned by the earth's progress in its annual orbit; and these will both conspire to render the *apparent* a little different from the *true* zenith. It is, however, the earth's diurnal motion that produces the principal change in the celestial situation of the zenith; for as this planet revolves on its axis, any given place on its surface has a corresponding succession of zeniths, which describe a circle, at the distance of its co-latitude from the nearest pole; and hence a succession of stars situated in this circle will appear to transit the zenith in a direction contrary to that of the earth's diurnal motion in every sidereal day, or time of one entire rotation. Hence, though the zenith of any place may be considered as a fixed point in the heavens,

as to its *direction*, when viewed by a spectator; yet as it has reference to the apparent place of a heavenly body, it is not fixed, because the earth's motion is continually carrying the spectator's eye in a circle that produces the optical effect of an apparent circumpolar revolution of the celestial bodies. Whatever point of the hemisphere is at any moment vertical to an observer on any part of the globe, *that point* is the *zenith* for the time *then passing*, and will again be the zenith, or very nearly so, after an interval of one complete rotation of the earth; and, therefore, strictly speaking, in every place there are as many successive zeniths in this period, as there are appreciable points in the circle generated in the heavens by the superior end of the vertical line carried round by the globe in rotation.

Because every point of the horizon is just 90° distant from the existing zenith, in every place, and at all times, it will be readily apprehended, that the complement of the altitude of any heavenly body will, at any instant, be the angular distance of that body from the zenith of the place of observation; but as this distance varies inversely with the altitude, it is more properly called the *co-altitude* than the *zenith-distance*, the former being a variable, and the latter a limited quantity. The *zenith-distance* of any star is properly the complement of its *meridian* or *greatest* altitude in any given place, and as the latitude of the place varies, so will the zenith-distance of the same body, but inversely; the distance of the zenith to the pole being always the complement of the latitude. Hence it is obvious, that when the zenith-distance of a star is observed by any instrument that measures it accurately, the latitude of the place may be inferred from the tabular polar distance of that star, as well as from the declination, which is its complement; and, therefore, it is a matter of no importance in theory, whether the altitude or zenith-distance of a body transiting the meridian be taken, for the purpose of ascertaining its place in the heavens, when the latitude of the observer is known, or for the purpose of determining the latitude of the place, when the declination, or polar distance of the body, is known. Accordingly, in the circular instruments that have been recently introduced into observatories, and that will reverse in position, it is usual to number the divisions and subdivisions so, that when they read altitudes with the graduated plane facing the east, they read zenith-distances (on the meridian) when the same is made to face the west, and *vice versa*; so that not only are the opposite errors of collimation of the telescope and of the bubble or plumb-line thus corrected, but when atmospheric refraction is allowed for, the sum of the two readings, or of the averages of several, will be exactly 90° , or otherwise 180° , if the observations be truly taken, and the instrument duly adjusted for zero and collimation; which check is of great practical importance in the delicate operations of the astronomer.

ZENITH-SECTOR is an *astronomical* instrument, by means of which the angular distance of a star is accurately measured from the zenith point of any given place towards the north or south. The first instrument made use of for this purpose was contrived by Dr. Hooke, with a view of determining the annual parallax of a fixed star, agreeably to the suggestion of Galileo. The telescope, which Dr. Hooke, in the year 1669, made the essential part of his instrument, was thirty-six feet long, the principle of achromatism not being at that time practically applied, so as to allow of considerable power with a short focal distance of the object-glass; but the length of the radius of his arc of measurement promised advantages over every other instrument, which justified the conception and execution of the

plan, though its accomplishment failed of corresponding success. Indeed, the nice arts of constructing achromatic telescopes, and of dividing the arc of a circle with extreme precision, had neither of them yet been perfected. From the Cutlerian Lectures we learn, that the first observation with this instrument was made on the 6th of July of the above-mentioned year, on the star denominated γ Draconis, which, on that evening, was found to pass at the distance of $2' 12''$ to the north of the zenith of Gresham college; which was also found to be the case on the 9th of the same month: but on the 6th of August next following, the distance was only $2' 6''$; and on the 21st of October after only $1' 48''$, or $1' 50''$; whence it was concluded, that the measurement of a zenith-distance taken by this instrument was liable to an error of $24''$, or perhaps more; and it was considered, therefore, that the instrument was quite incompetent to the purpose for which it was intended. But an original idea once suggested, as the basis of useful speculation, is not readily abandoned, even under an apparent want of successful application. The Hon. Samuel Molyneux afterwards availed himself of the manual skill of the ingenious Graham, and by the assistance of Dr. Bradley put up a zenith-sector at Kew, in the year 1725, which turned out to be much more accurate than its predecessor, though the focal length of the object-glass of its telescope was only $24\frac{1}{2}$ feet. With this instrument, and with one of about one-half its focal length, were made two of the most important discoveries in astronomy that have graced the annals of this science; *viz.* the *nutations* of the earth's axis, and the *aberration of light* in its passage from the heavenly bodies. As the history of astronomical discoveries, and that of astronomical instruments, are mutually illustrative of each other, and as a detail of the *minutiae* is always interesting, that connect great results with primary measures, that might otherwise be considered as insignificant, we will make no apology for introducing here Dr. Bradley's own account of his proceedings, as inserted in the Philosophical Transactions of London, N^o 406. p. 149 of the Abridg.

"The following observations," says the author, "were begun by the honourable Samuel Molyneux at Kew, continued and repeated by myself at Kew and Wanstead, in hopes of verifying those that Dr. Hooke formerly communicated to the public, concerning the *parallax of the fixed stars*. (London, 1674.) Therefore the same star was made choice of by Mr. Molyneux, almost the same method followed, and his instrument constructed upon principles nearly the same, but greatly exceeding the doctor's in exactness, which was chiefly owing to our curious member (of the Royal Society) Mr. George Graham, to whom the lovers of astronomy are also indebted for several other exact and well-constructed instruments. Mr. Molyneux's apparatus was completed and fitted for observing about the end of November, 1725; and on the 3d day of December following, the bright star in the head of Draco (marked γ by Bayer) was for the first time observed, as it passed near the zenith, and its situation carefully taken with the instrument. The like observations were made on the 5th, 11th, and 12th days of the same month; and there appearing no material difference in the place of the star, a farther repetition of them at this season seemed needless, it being a part of the year wherein no sensible alteration of parallax in this star could soon be expected. It was chiefly, therefore, curiosity that tempted me (being then at Kew, where the instrument was fixed) to prepare for observing the star on Dec. 17th, when, having adjusted the instrument as usual, I perceived that it passed a little more southerly this

day than when it was observed before. Not suspecting any other cause of this appearance, we first concluded, that it was owing to the uncertainty of the observations, and that either this or the foregoing were not so exact as we had before supposed; for which reason we proposed to repeat the observation again, in order to determine from whence this difference proceeded; and upon doing it on Dec. 20th, I found that the star passed still more southerly than in the former observations. This sensible alteration the more surprised us, in that it was the *contrary way* from what it would have been had it proceeded from an annual parallax of the star; but being now pretty well satisfied that it could not be entirely owing to the want of exactness in the observations, and having no notion of any thing else that could cause such an apparent motion as this in the star, we began to think that some change in the materials, &c. of the instrument itself might have occasioned it. Under these apprehensions we remained some time; but being at length fully convinced, by several trials, of the great exactness of the instrument, and finding by the gradual increase of the star's distance from the pole, that there must be some regular cause that produced it, we took care to examine nicely, at the time of each observation, how much it was: and about the beginning of March, 1726, the star was found to be 20'' more southerly than at the time of the first observation. It now, indeed, seemed to have arrived at its utmost limit southward, because in several trials made about this time, no sensible difference was observed in its situation. By the middle of April, it appeared to be returning back again towards the north; and about the beginning of June, it passed at the same distance from the zenith as it had done in December, when it was first observed.

"From the quick alteration of this star's declination about this time, (it increasing a second in three days,) it was concluded, that it would now proceed northward, as it before had gone southward of its present situation; and it happened as was conjectured; for the star continued to move northward till September following, when it again became stationary, being then near 20'' more northerly than in June, and no less than 39'' more northerly than it was in March. From September the star returned towards the south, till it arrived in December to the same situation it was in at that time twelve months, allowing for the difference of declination on account of the precession of the equinox.

"This was a sufficient proof that the instrument had not been the cause of this apparent motion of the star; and to find one adequate to such an effect seemed a difficulty. A *nutations of the earth's axis* was one of the first things that offered itself upon this occasion; but it was soon found insufficient; for though it might have accounted for the change of declination in γ Draconis, yet it would not at the same time agree with the phenomena in other stars; particularly in a small one almost opposite in right ascension to γ Draconis, at about the same distance from the north pole of the equator; for, though this star seemed to move the same way as a nutation of the earth's axis would have made it, yet in changing its declination but about as much as γ Draconis in the same time, (as appeared upon comparing the observations of both made upon the same days, at different seasons of the year,) this plainly proved that the apparent motion of the stars was not occasioned by a real nutation, since, if that had been the cause, the alteration in both stars would have been near equal.

"The great regularity of the observations left no room to doubt, but that there was some regular cause that pro-

duced this unexpected motion, which did not depend on the uncertainty or variety of the seasons of the year. Upon comparing the observations with each other, it was discovered, that in both the fore-mentioned stars, the apparent difference of declination from the *maxima* was always nearly proportional to the versed sine of the sun's distance from the equinoctial points. This was an inducement to think, that the cause, whatever it was, had some relation to the sun's situation with respect to those points. But not being able to frame any hypothesis at that time, sufficient to solve all the phenomena, and being very desirous to search a little farther into this matter, I began to think of erecting an instrument for myself at Wanstead, that, having it always at hand, I might with the more ease and certainty inquire into the laws of this new motion. The consideration, likewise, of being able by another instrument to confirm the truth of the observations hitherto made with Mr. Molyneux's was no small inducement to me; but the chief of all was the opportunity I should thereby have of trying in what manner other stars were affected by the same cause, whatever it was. For Mr. Molyneux's instrument being originally designed for observing γ Draconis, (in order, as I said before, to try whether it had any sensible parallax,) was so contrived, as to be capable of but little alteration in its direction, not above seven or eight minutes of a degree; and there being few stars within half that distance from the zenith of Kew bright enough to be well observed, he could not, with his instrument, thoroughly examine how this cause affected stars differently situated with respect to the equinoctial and solstitial points of the ecliptic.

"These considerations determined me; and by the contrivance and direction of the same ingenious person, Mr. Graham, my instrument was fixed up, August 19, 1727. As I had no convenient place where I could make use of so long a telescope as Mr. Molyneux's, I contented myself with one of but little more than half the length of his, (*viz.* of about $12\frac{1}{2}$ feet, his being $24\frac{1}{2}$;) judging from the experience which I had already had, that this radius would be long enough to adjust the instrument to a sufficient degree of exactness; and I have had no reason since to change my opinion; for from all the trials I have yet made, I am very well satisfied that when it is carefully rectified, its situation may be securely depended upon to half a second. As the place where my instrument was to be hung in some measure determined its radius, so did it also the length of the arc, or limb, on which the divisions were made to adjust it; for the arc could not conveniently be extended farther than to reach to about $6\frac{1}{2}^\circ$ on each side my zenith. This indeed was sufficient, since it gave me an opportunity of making choice of several stars, very different both in magnitude and situation; there being more than two hundred inserted in the British Catalogue, that may be observed with it. I needed not to have extended the limb so far, but that I was willing to take in *Capella*, the only star of the first magnitude that comes so near my zenith.

"My instrument being fixed, I immediately began to observe such stars as I judged most proper to give me light into the cause of the motion already mentioned. There was variety enough of small ones, and not less than twelve that I could observe through all the seasons of the year; they being bright enough to be seen in the day-time, when nearest the sun. I had not been long observing, before I perceived that the notion we had before entertained of the stars being farthest north and south, when the sun was about the equinoxes, was only true of those that were near the solstitial colure; and after I had continued my observations a few months,

months, I discovered what I then apprehended to be a general law observed by all the stars, *viz.* that each of them became stationary, or was farthest north or south, when they passed over my zenith at six of the clock, either in the morning or evening. I perceived likewise, that whatever situation the stars were in with respect to the cardinal points of the ecliptic, the apparent motion of every one tended the same way, when they passed my instrument about the same hour of the day or night; for they all moved southward while they passed in the day, and northward in the night; so that each was farthest north, when it came about six of the clock in the evening, and farthest south, when it came about six in the morning.

"Though I have since discovered, that the *maxima* in most of these stars do not happen exactly when they come to my instrument at those hours; yet not being able at that time to prove the contrary, and supposing that they did, I endeavoured to find out what proportion the greatest alterations of declination in different stars bore to each other, it being very evident that they did not all change their declination equally. I have before taken notice, that it appeared from Mr. Molyneux's observations, that γ Draconis altered its declination about twice as much as the fore-mentioned small star almost opposite to it; but examining the matter more particularly, I found that the greatest alteration of declination in these stars was as the sine of the latitude of each respectively. This made me suspect that there might be the like proportion between the *maxima* of other stars; but finding that the observations of some of them would not perfectly correspond with such an hypothesis, and not knowing whether the small difference I met with might not be owing to the uncertainty and error of the observations, I deferred the farther examination into the truth of this hypothesis, till I should be furnished with a series of observations made in all parts of the year, which might enable me not only to determine what errors the observations are liable to, or how far they may safely be depended upon, but also to judge whether there had been any sensible change in the parts of the instrument itself.

"Upon these considerations, I laid aside all thoughts at that time about the *cause* of the fore-mentioned phenomena, hoping that I should the more easily discover it, when I was better provided with proper means to determine more precisely what they were.

"When one year was completed, I began to examine and compare my observations; and having pretty well satisfied myself as to the general laws of the phenomena, I then endeavoured to find out the cause of them. I was already convinced that the apparent motion of the stars was not owing to a *nutations* of the earth's axis. The next thing that offered itself was an *alteration* in the *direction* of the *plumb-line*, with which the instrument was constantly rectified; but this, upon trial, proved insufficient. Then I considered what *refraction* might do, but here also nothing satisfactory occurred. At last I conjectured that all the phenomena hitherto mentioned proceeded from the *progressive motion of light*, and the *earth's annual motion in its orbit*. For I perceived that if light was propagated in time, the apparent place of a fixed object would not be the same when the eye is at rest, as when it is moving in any other direction than that of the line passing through the eye and object; and that when the eye is moving in different directions, the apparent place of the object would be different."

The author then proceeds to deduce from his observations the relative velocities of light, and of the earth in its annual orbit; shews what variation in the right ascension

and declination of stars differently placed may arise out of the *aberration* of light; and concludes that light, agreeably to such deductions, must travel from the sun to the earth in about $8' 7''$.5 of time. (See *ABERRATION, LIGHT, and STARS.*) The discovery of the earth's *nutations* was not, however, published until the year 1737. See *NUATION.*

After our readers have seen what important discoveries and deductions have been derived from Graham's zenith-sector in the hands of a skilful astronomer, they will be naturally disposed to become acquainted with its construction, which we will now proceed to describe.

Zenith-Sector by Graham.—The zenith-sector that we have said Graham made for Mr. Bradley, afterwards Dr. Bradley, was removed to Greenwich, when the proprietor became astronomer royal, and is the same instrument which Dr. Maskelyne used with great success in adjusting, by comparison, the zero of the large quadrants. It still remains at Greenwich, and is yet capable of measuring zenith-distances to the accuracy of half a second, according to Bradley's original report, or even less. *Fig. 1. of Plate XXXIII. of Astronomical Instruments,* is a representation of the essential parts of this instrument: A B represents the iron tube of the vertical telescope, which is supported by two small metallic cylinders projecting at right angles from the superior end, one of which is seen at *a*, and the other is hidden by the tube. These cylinders, which constitute the axis of motion, rest in a pair of Ys, attached to the solid wall facing the north, and also occasionally to another pair fixed to a wall facing the south; which additional pair allows the ends of the cylinders, or axis of motion, to be reversed in position. The brass bar C D is fixed to the same wall to which the pair of Ys are attached, at opposite sides of the room, and bears a cock to which the micrometer-screw E is fixed, which measures the fractional portion of a minute on its head *b*; and the second screw *c* is made to relieve it. The ends of these screws press against studs inserted into the tube of the telescope, while the weight F pulls a string round the fixed pulleys G and H, by means of a pliable cord, attached to the tube at the point *d*, and keeps the telescope home. The graduated arc I K contains $12\frac{1}{2}^\circ$, each subdivided into twelve parts, or five minute spaces, and is fixed exactly at right angles to the tube, over the point where the wires intersect the field of view. This arc was originally of brass, but Sisson put on an arc of steel, containing gold pins to receive the dots of division. A plumb-line suspended from the superior end of the tube, over the centre of one of the cylinders *a*, and having an adjusting screw *e*, to bring the point of suspension to the upper dot, falls near the face of the arc, and indicates the distance from zero at the middle of the arc; if the plumb-line covers one of the dividing dots of the scale, when a star near the zenith is cut by the horizontal wire, then the quantity is read by the plumb-line and arc alone; but otherwise the fractional portion is ascertained by means of the micrometer-screw, which is made to press against the tube until the suspended line coincides with the next nearest dividing dot of the scale. The value of the micrometer-head, which is divided into thirty-four equal parts, was ascertained by trying how many revolutions of the screw would measure a degree, or other portion of the arc, exactly; and on an average of several trials made in different parts of the arc, it was ascertained, that one revolution was not precisely $34''$, but $33''$.6328, and one of its divisions on the head, therefore, only $0''.9892$, instead of $1''$, as was intended by the maker. The instrument had originally a single lens for its object-glass; but at the request of the late Dr. Maskelyne, Mr. Dollond substituted

situated an achromatic object-glass, which has modernized the instrument, and put it nearly on a level with the new instruments which have lately been constructed and erected in the Royal Observatory by Troughton, on the best principles. If the zenith-sector had been made to reverse in position in the same situation, *i. e.* without being carried across the room, its use would have been more convenient, and the observations more certain, inasmuch as the same distance would have been preserved between the axis of motion of the telescope, and the point acted upon by the micrometer-screw, without any refuting allowance. Besides, the instrument would have been less liable to accidents; and reversed observations might probably have been made on the same evening. When Bird afterwards made a zenith-sector for the Oxford Observatory, he noticed these inconveniences, and obviated them by making the tube of the telescope turn round in its own place, so that the positions of the axis can be reversed by an azimuthal motion that carries the plumb-line round at the same time; and when the plumb-line will cover the dot at zero during this whole motion, the telescope is truly vertical.

The adjustment for collimation is effected by an apparatus that moves the wires in the eye-piece, as in the transit-instrument, and may be thus effected: Let the graduated arc face the east, and view a star passing in or near the zenith, the proper time for doing which may be known from the star's right ascension, by means of a sidereal clock, or by conversion of solar into sidereal time, and note the distance from zero when the plumb-line is quiet, which it will soon be if the plummet is immersed in a goblet of water, and mark down this quantity as read partly by the divisions on the scale, and partly by the micrometer-head; which call the *eastern* measure with N. or S. annexed, accordingly as the star passes to the north or south side of the zenith point: then reverse the position, and on a succeeding night, which will be 3' 56" sooner on every successive night, measure the zenith-distance of the same star in like manner with the graduated scale facing the west; and call it the *western* measure: then if the two quantities thus measured be similar, the collimation for zenith-distance will be true; but if otherwise, one half of the difference of the two readings will be the *error* of collimation, which may be either corrected by the proper apparatus at successive trials, or, which is perhaps better, may be allowed for in each observation. When the instrument has been used for several observations, it will be still better to take an average of all the observed errors, as ascertained by different stars, and to apply it with its proper sign in future single observations, so long as the instrument remains in all respects unaltered. It is hardly necessary to observe, that in using this instrument, when a star is very near the zenith of any place, the micrometer alone, without reference to the graduated scale or arc, will give the due measure. How the latitude of any place may be very accurately determined from the measured zenith-distance of a star, of known declination, will be seen presently.

Zenith-Sector by Ramsden.—While the trigonometrical survey of England was carrying on, it was found desirable to have a portable zenith-sector to assist in measuring an arc of the meridian, and as Ramsden had one in a half-finished state, that had been ordered by the duke of Richmond, the parties were prevailed on to have this finished for the purpose, which was nearly done in Ramsden's life-time, in the year 1801, and completed in April 1802 by his successor Berge. It was first tried at Greenwich, and then removed to the Isle of Wight, where the operations began, and from whence they were continued northward from station to sta-

tion, as described in the "Trigonometrical Survey," by captain William Mudge, and published from time to time by Mr. Faden, of Charing-Crofs. The original account of this complex instrument has reference to six large plates, and is too long for us to copy. (See vol. ii. p. 6. *5th seq.* of part ii.) Fig. 2. of our *Plate XXXIII.* of *Astronomical Instruments*, gives a reduced perspective view of this instrument, from an examination of which a better idea will be formed of its general construction than by any detailed account we can give of its parts without the additional plates.

Captain Mudge says, "that Mr. Ramsden has here obviated the inconveniences attendant on the use of former sectors; and has also diminished, in a very considerable degree, the errors unavoidably resulting from their imperfect construction. The principles, he adds, on which he has founded the several improvements, consist in the means of uniting the sectorial tube to its axis, so as to ensure the permanency of the length of its radius, when erected for observations; more accurate methods of adjusting the instrument vertically; and an easy way of placing the face of its arc in the plane of the meridian." The frame exhibited in our figure consists of two parts; the external stand of mahogany, which supports the apparatus to which the sectorial tube is attached; and an inner frame, containing that apparatus with the tube itself. The stand, or outer frame, is in the shape of an obtruncated pyramid, having a base six feet square, and its vertex three. It unites strength with simplicity of construction. The inner frame, within which the sector is suspended, is supported at top in every lateral direction, while its lower extremity is terminated by a cone resting in a metallic concavity, on which it turns in azimuth; and it can be kept in any position by a clamping apparatus acting with an azimuth circle, made fast to the bottom of the external frame. The telescope of the sector has an object-glass nearly eight feet long, with an aperture of four inches, near which is made fast the transverse axis of motion, similar to that of a transit-instrument. The wires of the eye-piece of the telescope are illuminated by reflected light, entering the axis in the usual way; and a plumb-line, with the ghoft apparatus for adjustment to zero, is made a leading feature in the construction. The arc is divided into 15°, which was the concluding work done by Berge, and each degree is subdivided into 5' spaces, as in Graham's instrument. A second telescope, of 29 inches focal length, is attached to the long tube, and moves in the plane of the divided arc to any given elevation, but partakes of the azimuthal motion when the long vertical telescope is turned round: with this 29-inch telescope horizontal angles are measured, by the help of the azimuth circle, which therefore is divided for this purpose. Besides these essential parts, there are various appendages and bracing parts, rendered necessary by the size of the instrument, particularly a microscopic tube reaching up to the upper dot of the plumb-line, and bent at both ends into a horizontal position for convenience of the observer. This contrivance required reflectors, both of the light, and of the image of the piece of mother-of-pearl that is bisected by the wire, constituting the plumb-line. The micrometer measures minutes and seconds in the usual way, and the plummet is immersed in a small vessel of water to prevent vibration. We mention these particulars generally, not only because their particular uses and modes of application have been previously described, when we explained other instruments, such as CIRCLES, EQUATORIALS, TRANSIT-Instruments, &c.; but because this instrument has furnished hints to others who have copied in part, or wholly, several

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several of Ramsden's contrivances. It was moreover necessary to introduce various weights, pulleys, cords, springs, &c. to facilitate and keep steady the motions of the different acting parts, which, together with the reading microscopes, lamps, rods, and adjusting screws, give the instrument the appearance of great complexity.

The manner of adjusting the instrument for observation is thus performed, according to Mr. Mudge's own words: *viz.* "The feet of the external stand should be first carefully brought into a horizontal plane; and when they are so, the azimuth circle will be necessarily parallel to it, having its centre under the middle of the opening in the mahogany frame screwed on the top of the stand. This being done, and the instrument set up, the plane of the arc should be brought parallel to one of the sides of the stand, in which situation the internal frame is to be clamped to the azimuth circle, and the wire brought to its proper distance from the limb, by means of the adjusting screw attached to one of the sliders, which carries the concave receptacle and conical point. The dot at zero should then be brought exactly under the plumb-line, as seen through the magnifier, and the point on the micrometer-head, at which its index stands, noted. The instrument is then to be turned half round; and if the same dot on the arc still continues bisected, it will afford a proof of the internal stand being upright in one direction. But if the dot should not continue bisected by the plumb-line, it must be made to do so, and the revolutions, or parts of a revolution, counted; half of which is to be turned back on the micrometer-head. The same dot, zero, is then to be brought under the plumb-line (wire), by

means of the other adjusting screw, beneath the azimuth circle. If the stand is pretty accurately set up, one operation is sufficient for bringing the interior frame upright in one direction, *viz.* either in that of the meridian, or the one at right angles to it. The arc is then to be turned round 90°, and the same operation gone through. This being properly done, the interior frame is made perfectly upright. The next step to be taken is that of placing the long level on its axis above, and rectifying that axis by means of the Y plate screws. If this be done carefully, the bubble will remain between the pointers of the level, whatever position the sector may be placed in. Having thus rectified the instrument, by making the internal frame upright, and the axis horizontal, the only remaining point to engage attention is, placing the plumb-line at a proper distance from the arc: this is done by means of the screw acting on the spring just under its point of suspension. If great care be used in going through these several adjustments, the instrument may, at any future time, be accurately adjusted for observation by turning the proper screw belonging to the azimuth circle, and bringing the arc to its usual distance from the wire."

In order to shew the accurate results that may be obtained from an instrument of this description, and also the care that is necessary in using it, and in clearing the observations of errors arising from natural causes, we will subjoin a few Tables that were found useful in the grand trigonometrical operations, by means of which, in the years 1802 and 1806, the meridian arcs were compared with the corresponding terrestrial measurements.

TABLE shewing the Runs of the Micrometer-Screw over every Five Minutes in the First Degree on each Side of Zero.

Right-Hand Arc.				Left-Hand Arc.			
At	Rev.	Div.	Rev. Div.	At	Rev.	Div.	Rev. Div.
0° 0'	8	55.43	5 4.45	0° 0'	9	16.31	5 4.54
0 5	14	0.88		0 5	4	11.77	
0 5	9	32.55	5 4.55	0 5	9	8.73	5 4.56
0 10	14	37.10		0 10	4	4.17	
0 10	9	40.03	5 4.34	0 10	8	53.67	5 4.50
0 15	14	44.37		0 15	3	49.17	
0 15	9	19.13	5 4.45	0 15	9	16.13	5 4.44
0 20	14	23.58		0 20	4	11.69	
0 20	9	54.07	5 4.40	0 20	9	17.50	5 4.53
0 25	14	58.47		0 25	4	12.97	
0 25	9	39.23	5 4.41	0 25	10	4.30	5 4.50
0 30	14	43.64		0 30	4	58.80	
0 30	9	25.77	5 4.44	0 30	8	52.0	5 4.47
0 35	14	30.21		0 35	3	47.53	
0 35	9	58.53	5 4.54	0 35	9	7.83	5 4.53
0 40	15	4.07		0 40	4	3.30	
0 40	9	0.53	5 4.54	0 40	9	3.31	5 4.41
0 45	14	5.07		0 45	3	57.90	
0 45	9	12.47	5 4.55	0 45	9	12.63	5 4.40
0 50	14	17.02		0 50	4	8.23	
0 50	9	43.07	5 4.43	0 50	9	4.50	5 4.47
0 55	14	47.50		0 55	4	0.03	
0 55	8	41.27	5 4.50	0 55	8	35.0	5 4.57
1 0	13	45.77		1 0	3	30.43	

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TABLE for converting the Divisions shewn on the Micro-meter Head into Seconds, the Space subtended by Five Minutes on the Limb being found equal to Five Revolutions and Forty-five Divisions, as deduced from the Measurement of the total Arcs.

Div.	"	Div.	"
1	1.002	31	31.052
2	2.003	32	32.053
3	3.005	33	33.055
4	4.007	34	34.057
5	5.008	35	35.058
6	6.010	36	36.060
7	7.012	37	37.062
8	8.013	38	38.063
9	9.015	39	39.065
10	10.016	40	40.067
11	11.018	41	41.068
12	12.020	42	42.070
13	13.022	43	43.072
14	14.023	44	44.073
15	15.025	45	45.075
16	16.027	46	46.077
17	17.028	47	47.078
18	18.030	48	48.080
19	19.032	49	49.082
20	20.033	50	50.083
21	21.035	51	51.085
22	22.037	52	52.087
23	23.038	53	53.088
24	24.040	54	54.090
25	25.042	55	55.092
26	26.043	56	56.093
27	27.045	57	57.095
28	28.047	58	58.097
29	29.048	59	59.098
30	30.050	60	60.100

TABLE for supplying the necessary Correction to the observed Zenith-Distance of a Star, on account of the Expansion or Contraction of the Sectorial Tube by One Degree of Heat.

Zenith Distance observed.		Correction for One Degree of Heat.
°	'	"
1	0	0.018
1	30	0.028
2	0	0.037
2	30	0.046
3	0	0.056
3	30	0.065
4	0	0.074
4	30	0.084
5	0	0.093
5	30	0.102
6	0	0.111
6	30	0.121
7	0	0.130
7	30	0.139

OBSERVATIONS made by Captain William Mudge on the Zenith-Distances of γ Draconis, with Ramsden's Zenith-Sector, at different Places.

TABLE I.—Greenwich Observatory, 1802. Point on the Limb 0° of N.

Day of the Month.	Face.	Plumb-line.		Observation of the Star.		Zenith-Distance in Revolutions.		Zenith-Distance Reduced.		Barometer	Thermometer.			
		Rev.	Div.	Rev.	Div.	°	'	°	'		Inches.	Above.	Below.	
Apr. 16	W.	10	21.73	8	18.5	0	0	2	3.23	0	2	1.43	29.9	45.0
19	W.	9	9.40	7	4.1				5.30			3.50	31.1	53.0
22	E.	8	14.48	10	9.5	1		1	54.02	1		53.21	29.9	55.0
23	E.	9	21.79	10	18.5				55.71			54.90	30.1	38.0
25	W.	9	39.52	7	34.4	2		2	5.12	2		3.32	29.0	44.0

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TABLE II.—Dunnofe, 1802. Point on the Limb $0^{\circ} 50' N$.

Day of the Month.	Face.	Plumb-line.		Observation of the Star.		Zenith-Distance in Revolutions.		Zenith-Distance Reduced.		Barometer.	Thermometer.							
		Rev.	Div.	Rev.	Div.	o	i	Rev.	Div.		o	i	Above.	Below.				
May	10	E.	10	15.52	13	48.1	o	50	3	32.75	o	53	30.10	Inches.	29.0	—	o	45.0
	11	W.	9	38.66	5	56.4				41.26			38.62	28.85	43.9		43.5	
	13	E.	8	47.30	12	81.4				34.10			31.45	28.85	36.5		38.0	
	14	W.	7	32.38	3	49.2				42.18			39.54	28.92	34.5		34.5	
June	16	E.	9	40.0	13	15.2				34.20			31.55	28.82	35.5		36.5	
	11	W.	7	20.70	3	29.5				50.20			47.58	28.34	53.5		52.5	
	13	E.	9	36.35	13	20.3				42.95			40.31	28.79	52.5		52.3	
	14	W.	8	25.26	4	33.4				50.86			48.24	28.26	54.3		53.0	
	16	E.	9	48.33	14	37.4				45.07			43.44	28.75	59.5		60.0	
	17	W.	8	32.66	4	39.4				52.26			49.64	28.82	56.0		58.0	
	18	E.	11	32.77	15	17.9				44.13			41.50	28.8	52.0		51.0	
	20	W.	8	9.48	4	17.0				51.48			48.86	29.97	58.6		57.0	
	21	E.	11	52.92	15	40.0				47.08			44.45	28.83	56.0		55.5	

TABLE III.—Clifton, 1802. Point on the limb $1^{\circ} 55' S$.

Day of the Month	Face.	Plumb-line.		Observation of the Star.		Zenith-Distance in Revolutions.		Zenith-Distance Reduced.		Barometer.	Thermometer.							
		Rev.	Div.	Rev.	Div.	o	i	Rev.	Div.		o	i	Above.	Below.				
July	20	W.	11	49.24	13	12.8	1	55	1	22.56	1	56	21.69	Inches.	28.9	56.5	55.0	
	21	E.	7	23.81	5	53.7				29.11			28.26	28.5	53.0		52.2	
	22	W.	7	54.31	9	17.1				21.79			20.92	28.7	54.5		54.5	
	23	E.	3	46.15	2	18.9				27.25			26.39	29.0	56.1		56.1	
	26	W.	9	8.47	10	29.5				21.03			20.16	28.8	64.0		64.0	
	28	E.	9	35.56	8	9.6				25.96			25.11	28.8	56.2		57.3	
	29	W.	8	44.41	10	4.5				19.09			19.03	29.0	56.5		56.5	
	Aug.	1	W.	8	41.22	10	3.0				20.78			19.91	29.2	59.5		57.0
		3	E.	9	7.59	7	40.3				26.29			25.43	29.1	68.0		64.5
		5	E.	7	50.50	6	25.0				25.50			24.64	29.0	73.0		71.0
7		W.	9	7.55	10	24.6				17.05			16.18	28.9	64.2		65.2	
12		E.	11	7.56	9	42.7				23.86			23.0	29.1	57.5		57.5	
13		W.	8	12.48	9	29.4				16.92			16.04	29.3	63.0		61.2	
17		E.	8	10.32	6	46.0				23.32			22.46	29.0	69.5		70.5	
18		W.	8	32.97	9	48.5				15.53			14.65	28.8	70.0		70.1	

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TABLE IV.—Arbury-Hill, near Daventry, 1802. Point on the Limb $0^{\circ} 40' S$.

Day of the Month.	Face.	Plumb-line.		Observation of the Star.	Zenith-Distance in Revolutions.				Zenith-Distance Reduced.			Barometer.	Thermometer.		
		Rev.	Div.		0	1	Rev.	Div.	0	1	2		Inches.	Above.	Below.
Sept. 10	W.	8	53.85	11	6.4	0	40	2	11.55	0	42	9.76	28.2	51.5	54.0
11	E.	8	47.75	6	31.9				15.85			14.07	28.53	48.2	55.0
18	E.	9	46.65	7	28.7				17.95			16.17	28.8	70.3	72.3
19	W.	9	18.90	11	31.5				12.60			10.82	28.8	67.5	73.5
20	E.	9	1.78	6	42.8				17.98			16.20	28.8	68.3	71.4
22	E.	9	16.52	6	58.2				17.32			15.54	28.8	79.8	75.8
23	W.	8	9.97	10	20.5				10.53			8.74	28.8	67.5	65.3
24	E.	9	16.97	7	0.8				16.17			14.39	28.9	70.5	70.2
25	W.	9	16.0	11	27.6				11.60			9.81	29.1	74.0	75.2
26	W.	9	10.47	11	23.0				12.53			10.75	29.0	59.5	64.2
29	E.	9	17.50	7	0.8				16.70			14.92	29.1	64.0	69.5
30	W.	9	21.63	11	33.5				11.87			10.08	29.9	64.0	69.5
Oct. 1	E.	9	34.95	7	15.5				19.45			17.87	28.9	72.5	71.9
2	E.	9	25.33	7	7.0				18.33			16.57	28.8	71.0	75.0
3	W.	8	54.30	11	7.1				11.80			10.01	28.6	74.0	73.0

TABLE V.—Delamere Forest, 1806. Point on the Limb $1^{\circ} 40' S$.

Day of the Month.	Face.	Plumb-line.		Observation of the Star.	Zenith-Distance in Revolutions.				Zenith-Distance Reduced.			Barometer.	Thermometer.		
		Rev.	Div.		0	1	Rev.	Div.	0	1	2		Inches.	Above.	Below.
May 30	W.	10	14.2	7	49.82	1	40	2	23.38	1	42	21.61	29.37	49.5	50.0
June 2	E.	4	45.3	7	14.10				27.80			26.04	29.67	51.0	51.5
4	W.	9	49.1	7	29.0				20.10			18.33	28.96	48.0	49.0
5	E.	4	39.4	7	5.0				24.60			22.84	29.17	51.5	51.0
7	W.	13	6.6	10	44.73				20.87			19.01	29.55	51.5	54.5
9	E.	5	20.9	7	44.68				23.78			22.01	29.67	62.0	63.0

TABLE VI.—Burligh-Moor, 1806. Point on the Limb $3^{\circ} 5' S$.

Day of the Month.	Face.	Plumb-line.		Observation of the Star.	Zenith-Distance in Revolutions.				Zenith-Distance Reduced.			Barometer.	Thermometer.		
		Rev.	Div.		0	1	Rev.	Div.	0	1	2		Inches.	Above.	Below.
July 6	W.	9	11.5	11	14.9	3	5	2	3.40	3	2	46.4	29.25	51.0	51.0
7	E.	11	19.9	10	32.47			1	46.43		3	14.47	28.95	54.5	54.5
10	E.	10	16.0	8	25.8				49.20			11.22	29.59	65.0	62.5
11	W.	5	47.3	7	43.92				55.62			5.18	29.29	56.5	55.0
16	W.	5	7.5	7	4.24				55.74			5.07	29.1	51.5	51.5
18	W.	6	1.5	7	55.13				53.63			6.18	29.25	59.0	56.0
19	E.	9	36.6	7	46.61				48.99			11.83	29.36	56.5	55.0

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Besides these observations, various others were taken of different stars in Draco, Cygnus, Urfa Major, Hercules, Perseus, and Auriga, from an average of all which the final results were obtained; but before the true or mean zenith-distances can be exactly known, the apparent measures must be corrected by certain equations for aberration, nutation, semi-annual solar equation, precession, and refraction; the Tables proper for which are chiefly given under our article DECLINATION. It was deemed sufficient for our purpose in this place to confine ourselves to the consideration of the observations made on γ Draconis alone, which being a star of the second magnitude, and very near the zenith of London, and of the southern parts of England, was considered as the best object. We will therefore subjoin the reduction of the observations made on this star by way of illustrating their application in practical astronomy.

Reduction of the Observations contained in Table I.

	Face of Limb West.	Face of Limb East.
Greenwich Observatory, 1802.	April 16. - - - $\circ \ 2 \ 28.37$	April 22. - - - $\circ \ 2 \ 19.05$
	19. - - - $\circ \ 0 \ 29.92$	23. - - - $\circ \ 0 \ 20.54$
	25. - - - $\circ \ 0 \ 28.55$	Mean E. - - - $\circ \ 2 \ 19.79$
	Mean - - - $\circ \ 2 \ 28.94$	Mean W. - - - $\circ \ 2 \ 28.94$
		$2) \ 0 \ 4 \ 48.73$
Apparent Mean of both positions - - - - -	=	$\circ \ 2 \ 24.36$
And also, half the difference, or collimation - - - - -	=	4.57
Then in Bode's Catalogue Dec. N. of γ Draconis, 1801 - - - - -	=	$51 \ 31 \ 5.$
Subtract for annual diminution $.7 + .3$ - - - - -	=	$1.$
True declination - - - - -	=	$51 \ 31 \ 4.$
And $2' \ 24''.36 + 0.03''$ (sum of Equations) true zenith-distance - - - - -	=	$2 \ 24.39$
The true latitude of Greenwich Observatory, as deduced from γ Draconis - - - - -	=	$51 \ 28 \ 39.61$

When the reductions are thus made for the observations taken at the other places, the zenith-distances and corresponding latitudes will stand thus, *viz.*

	Zenith Distance.	North Latitude.
Dunnofe	$1^{\circ} \ 50' \ 5.24'' \ N.$	$50^{\circ} \ 37' \ 7''.36$
Clifton	$1^{\circ} \ 56 \ 26.64 \ S.$	$53 \ 27 \ 30.64$
Arbury-Hill	$0 \ 42 \ 22.75 \ S.$	$51 \ 15 \ 26.75$
Delamere For.	$1 \ 42 \ 18.09 \ S.$	$53 \ 13 \ 19.09$
Burleigh Moor	$3 \ 3 \ 19.09 \ S.$	$54 \ 34 \ 20.09$

In obtaining the latitudes of the two last places, the declination of γ Draconis is diminished $3''$ to bring it to the year 1806, and in all the cases where S is annexed to the zenith-distance, it is *added* to the declination. The reductions are made to the first of January of the respective years, and the latitudes come out very nearly the same as those determined from terrestrial measurement, and also from an average of all the observed stars.

“From the observations made at the station in Delamere forest with the zenith-sector in 1806, combined with those at Dunnofe, 1802, taken with the same instrument,” says the author of the Survey, “it is found, that the difference in latitude of those is $2^{\circ} \ 36' \ 12''.2$ (by γ Draconis alone in our examples $2^{\circ} \ 36' \ 11''.73$), making a difference of $1''$ between the calculated and observed amplitudes, which, setting aside the consideration of the spherical figure of the earth, is at the rate of $\frac{1}{70}$ ths of a second in one degree. Perhaps, under the consideration of each meridional line being obtained independently of the other, and admitting that neither of them can be measured with perfect accuracy, together with the chances of the amplitudes being in some small degree either in excess

or defect, we may consider the result as sufficiently consistent and satisfactory, and may take 60823 fathoms, in latitude $52^{\circ} \ 34'$, or the centre of England, as the length of 1° ,” Trigonometrical Survey, vol. iii. p. 332, &c.

ZENITH-MICROMETER is an instrument of very recent date, and is scarcely yet known to the generality of astronomers. It differs from the zenith-sector in this respect; that the measures taken with it are all taken within the tube of the telescope, whereas those taken by the zenith-sector are all external: consequently the range of the zenith-micrometer's scale is confined to the extent comprised within the field of view, which will always be inversely as the magnifying power of the glasses used; hence the greater the power of the telescope, the smaller the number of stars that will pass within the range of the micrometer-screw; but then corresponding accuracy may be expected from the great powers and delicate construction of modern micrometers; and what is wanting in the extent of the scale will be made up by superior precision. The telescope, which constitutes the basis of the zenith-micrometer, may be either of the reflecting or refracting construction; and within a short space of time one of each description has been constructed; the former by Troughton, for the Greenwich observatory, and the latter by Dollond, for the use of those geodæic commissioners, who are employed by the English government to ascertain the proper line of demarcation across the American lakes. We will give a short account of each of these instruments, such as will enable our readers to form an opinion of their respective merits, as prototypes for future imitation.

Zenith-Micrometer by Troughton.—It is probable that the first

ZENITH.

first idea of a zenith-micrometer occurred to Mr. Troughton, and certain that he was the first who executed one, and gave it its name. It was in 1806 that he proposed it to Dr. Maskelyne, and in 1812 that he erected it at the Royal Observatory, as an appendage to the mural circle.

The telescope of this instrument is a Newtonian reflector, the tube of which forms the vertical axis, through which axis a plumb-line passes centrally from end to end; and, therefore, is not made to vibrate by turning. The tube or axis, 10 feet long, and 5 inches diameter, at the lower end terminates in a pivot, while the upper end is received by a right angle, against the sides of which it is gently pressed by two springs; contrivances which produce free and steady azimuthal motion.

All the zenith instruments require for collimation two positions, which in the sectors are called *face east* and *face west*; two at 180° distance from each other are equally necessary for the micrometer, and in that under consideration are indicated by the contact of stops, without regarding any divisions.

The large mirror at the lower end, as well as the pivot, are perforated, in order that the plumb-line may pass freely through them, the latter sustaining the plummet in a water vessel several inches below. The axis of the mirror is somewhat inclined to that of the tube, for the purpose of placing the plane mirror out of the way of the plumb-line, which latter, as before observed, occupies the centre. The rays of light, thus rather obliquely reflected up the tube, are turned into a horizontal direction by the plane mirror, and come to a focus a little beyond the side of the tube, where, with appropriate adjustments, is fixed a double micrometer for measuring zenith-distances.

When the instrument is stopped with the micrometer toward the south, one of the moveable wires is made to bisect a star a little before it comes to the centre of the field of view; then the instrument is turned to the opposite stop with the micrometer towards the north, which may be done in three seconds, and then the other moveable wire is made to bisect the star. It is evident now, that the opening between the wires is double the zenith-distance of the star, and if the axis was truly vertical, the middle between them is the point zenith. The revolutions of the screws are counted in the field of view, and the parts to the third decimal figure read off upon the micrometer heads, which revolutions and parts are to be reduced to angular measure.

The plumb-line is suspended from a fixed point at the upper end, and near the lower end is a rectangular arrangement of microscopes with adjustments, which, together with the adjustments of the pivot, accomplish the means of bringing the axis and plumb-line coincident with each other, and of assuring the vertical position of the former.

The conception of this instrument was not confined to a reflecting telescope, it was seen that a refracting one would succeed equally well: in the latter case, the pivot at the lower end must be perforated to receive the eye-glass, and the plumb-line should be exterior to the main tube, but inclosed in a smaller one to protect it from the action of the wind. In the case of the Greenwich instrument, of which the foregoing is a description, the reflector was preferred on account of its allowing the central position of the plumb-line, which, being free from vibration, shortens the time required for adjustment; a consideration indeed of very little value; for it is now known (but was not then) that instruments properly constructed, and used with care, which they now are at our national establishments, seldom or never

want re-adjustment. A better cause for adopting the reflector was, that the horizontal view is more easy than the vertical one, especially as in the former the hands and whole body are unembarrassed, and fit for action. But whichever construction of the telescope is employed, we know that Troughton considers the zenith-micrometer as one of the most elegant of his inventions.

Zenith-Micrometer by Dollond. — The zenith-micrometer which is represented in *Plate XXXIII.* by *figs. 3, 4, 5, and 6*, has great advantages in the simplicity of the construction and use, that former instruments for the same purpose do not possess, and is portable: the plan was proposed by Mr. Pond, the astronomer royal, and the instrument executed by Mr. Dollond for transatlantic measurements. It is drawn from a scale of two inches to the foot, and is represented without a stand or support. It can be applied to either, as occasion may require. The component parts are these; viz. an achromatic refracting telescope *AA*, (*figs. 3, 4.*) of 42 inches focal length, with an aperture of $2\frac{3}{4}$ inches; a micrometer *B*, with two screws, each moving a separate wire through the field of view, which is extended to two degrees. The transverse axis *C* is 18 inches long, and glazed for a telescope, with cross wires that adjust, so that when the principal telescope *A* is taken out, (and for which there is a provision,) the line of collimation may be truly adjusted to the pivots, and when replaced will be correctly at right angles to the principal telescope. The use of the axis being formed into a telescope, is, for the purpose of placing the instrument correctly in the meridian, by a mark that must be found to the east, and also by another to the west, so that when the star has been observed with one of the micrometer wires, and the instrument is changed for the purpose of observing the same star with the other micrometer wire, it may be correctly replaced, the mean of the two observations being the correct zenith-distance. The instrument is also furnished with a plumb-line *D*, and with a dot at *E*, the image of which is brought to the place of the plumb-line by a lens; this is known by the name of the *ghost* adjustment. The plumb-line is suspended from a piece at *F*. The two screws *GG* are used for bringing the dot carried by the telescope, to coincide with the plumb-line; and is observed to be so by the lens at *H*. This contrivance affords one of the greatest advantages of the instrument, as it enables the observer, at the moment before he observes the conjunction of the star with the micrometer wire, to ascertain the correct position of the instrument by the plumb-line; for the correctness of the observation will depend on the accuracy with which the plumb-line is made to coincide with the dot; and by this method the *error of division is done away*. The level (*fig. 6.*) is used for levelling the axis, and the circular piece (*fig. 5.*) with the *Ys a a* attached, in which the pivots of the transverse axis rest, may be applied to a mahogany-framed stand, or on a stone pier, or bracket: it is represented as it was made for a mahogany stand (which had adjusting screws at the feet); it consists of two strong brass plates, and is furnished with a circular motion for bringing the instrument into the meridian, which motion is given by a pinion *b*; and it is made fast by the four screws *c, c, c, c*. The two adjusting screws *G G*, *fig. 3.* must also be attached to a bracket or framed piece in the stand; and the support for the water, in which the plummet is immersed, may also be applied to this bracket. The wires are illuminated through the axis in the same manner as in the transit-instrument. The value of the micrometer-screws is to be found in the usual manner, and reduced into seconds.

The foregoing are the distinguishing properties of this instrument,

instrument, and as the method of using it may be understood sufficiently from what we have said of the zenith-sector, from which it differs only in the small range of its scale, it will be unnecessary to give any further explanation of either its adjustments or practical application.

Other Instruments.—Besides the zenith-sectors and zenith-micrometers, which we have above described, there are other instruments, which may be used as substitutes for these, at the same time that they may be used for their own respective purposes. Of these, the transit-circles of large dimensions, particularly those which move with their pivots supported by stone piers, claim our principal notice. As the professed use of these circles is to ascertain both right ascensions and declinations at the same time, and as zenith-distances are only complements of altitudes taken in any latitude, it is obvious, that those instruments that measure altitudes accurately, at all elevations, will also measure zenith-distances, or their complements; and in fact, the divisions are now numbered in such way, that altitudes and zenith-distances are read alternately in the reversed positions. Of this description is the excellent circle of Mr. Groombridge at Blackheath; but the large circle at Greenwich, not having a plumb-line or level used, nor being capable of reversal, is not of the same class; though a very superior instrument for its own purpose of measuring polar distances from the exact polar point, without any reference to latitude, altitude, or zenith-distance.

We have also before us an 18-inch transit-circle with a 3½-foot telescope, very lately made by Mr. Thomas Jones, of Charing-Cross; the axis of which is supported by a cast-iron frame, that very conveniently admits of measures being taken in or near the zenith, as well as in any other degree of elevation. This instrument comprises many new and useful contrivances, but they cannot be described under this head; consistently with our general plan of dividing our subjects.

ZENITH is a word used by some writers to express the first appearance of the menses in young women.

ZENKABAD, in *Geography*, a town of the Arabian Irak; 22 miles S. of Sherban.

ZENKOV, a town of Russia, in the government of Tchernigov; 140 miles S.E. of Tchernigov. N. lat. 50°. E. long. 34° 14'.

ZENN, a river of Franconia, which runs into the Rednitz, near Vacha, in the margravate of Anspach.

ZENN. See LANGENZENN.

ZENNA, the name of a mystical thread worn by Brahmans, and by many individuals of other tribes of Hindoos. So prolix and minute are the authors of the Ordinances of the Hindoos, that rules for almost every occurrence of life, however trifling, have been laid down. Not that any thing connected with the zennar has been deemed trifling by those who ordained it, by those who wear it, or those who revere it. On the contrary, the individuals to be so distinguished, the mode of manufacturing the sacred article, and its investiture, with many particulars, have occupied the attention of lawgivers, and are attended to with great respect by their obedient followers.

Brahmans affect to consider the zennar as of highly mysterious and sacred import, and do not consider an individual as fully a member of his tribe until he have assumed this holy emblem. A Brahman should be invested with it at the age of eight years, by the hands of his father, who, with his Guru, or spiritual preceptor, twists that first put on. A Khetriya receives it at eleven, from a Brahman. A Vaisya at twelve years of age. A Sudra is on no account permitted to wear it. A description of these four grand

divisions, comprising the whole race, will be found under SECTS of Hindoos.

The zennar must be made by a Brahman: it is composed of three threads, each measuring ninety-six hands, twisted together, and folded into three; then twisted again so as to consist of nine threads: these are again folded into three without twisting, and each end fastened with a knot. It is put over the left shoulder next the skin, and hangs down the right thigh as low as the fingers can reach. Of these cords a Brahman wears four; the other privileged tribes but three. Some writers call this the Brahmical, or priestly, or sacerdotal thread; but not, it would appear, in strict correctness; it not being confined to the priestly tribe, but worn, as we have seen, by three out of the four sects of Hindoos.

In the Institutes of Menu (see MENU), c. II. v. 36. the revered legislator ordains, that “in the eighth year from the conception of a Brahman, in the eleventh from that of a Khetriya, and in the twelfth from that of a Vaisya, let the father invest the child with the mark of his class.”

The two next verses allow, on particular occasions, the assumption of the sacrificial thread, as it is often called, in the fifth, sixth, or eighth years respectively; or it may, in like manner, be delayed until the individual be double the age mentioned in verse 36. “After that, all youths of these three classes, who have not been invested at the proper time, become outcasts, degraded from the Gayatri, and condemned by the virtuous,” v. 39. Of the Gayatri, see under our article O'M.

In ancient books, the three first classes, from being thus invested with this sacrificial thread, are called *twice born*; a regeneration being effected by this mystical second birth. But it has been thought, that in later times, the Brahman only has the advantage of being thus *born again*. The term *twice born* is very common; a *third birth* is sometimes mentioned; this, we believe, is at the decease, or the burning of the body. “The first birth is from a natural mother; the second, from the ligation of the zone; the third, from the due performance of the sacrifice: such are the births of him who is usually called twice born, according to a text in the Veda. Among them, his divine birth is that which is distinguished by the ligation of the zone and sacrificial cord; and in that the Gayatri is his mother.” Menu, ii. 169, 170.

This cord is never taken off; even when sleeping and bathing, it is worn and disposed of in a particular manner. When worn out, it is committed to the water with due and appropriate ceremony, and another is as duly put on. It is seen on the most ancient of Hindoo sculptures, and on many of the figures; for instance, in the cavern temple at Elephanta. (See MAHAKALA.) It has several other names; among them Janvi, or Jahnvi, Maurvi, &c. The latter is applied to the cord of the military tribe, being made from the leaves of a species of hyacinth, called murva, of which bow-strings are also made: the Brahman's cord is made of cotton. The name Jahnvi given to this sacred, triple, mystical, regenerating thread, has been derived from Jahn, an ascetic, who, in a very extravagant way, gave a second birth to the equally sacred, triple, mystical, regenerating river Ganga (the Ganges), which is hence called Jahnvi. Of this we have taken some notice under JAHNU; and of the triple union of the Ganga, and other sacred rivers, under TRIVENT.

Brahmans, and their enthusiastic followers, are very mystical concerning regeneration, and have divers modes of effecting the second birth, in cases where the purity derived from the ligation of the zone, or investiture with the sacrificial thread,

thread, hath been lost by the contaminations of unlawful acts, as from accidental defilements. Of this, see under our article *YONI*.

ZENO, in *Biography*, called the *Eleatic*, in order to distinguish him from *Zeno* the Stoic, was a native of Elea, in Magna Græcia, and said to have been the adopted son of Parmenides, whose disciple he was, flourished about the year 463, B.C. and chose to live in his native city rather than at Athens, for the sake of maintaining his independence. He is represented as a zealous friend of civil liberty, and as having lost his life in his opposition to a tyrant. It is said, that having been detected in a conspiracy against the petty tyrant of the place of his nativity, he endured the most cruel torments, because he would not betray his accomplices; and that at length his countrymen, roused by his fortitude, fell upon the usurper and stoned him to death. To him the invention of the dialectical art has been erroneously ascribed.

According to Aristotle, *Zeno* taught that nothing can be produced either from that which is similar or dissimilar; that there is only one being, and that is God; that this being is eternal, homogeneous, and spherical, neither finite nor infinite, neither quiescent nor moveable; that there are many worlds; that there is in nature no vacuum; that all bodies are composed of four elements, heat and moisture, cold and dryness; and that the body of man is from the earth, and his soul an equal mixture of these four elements. He argued with great subtlety against the possibility of motion. If Seneca's account of this philosopher deserves credit, he reached the highest point of scepticism, and denied the real existence of external objects.

Upon the whole, his sentiments seem to have been so fluctuating and unstable, and his method of arguing so versatile, that it is not certain whether he allowed or denied a properly divine nature. Moshelm, not improperly, applied to the doctrine of *Zeno* the words of Terence:

“ — Incerta hæc, si tu postules
Ratione certa facere, nihil plus agas,
Quàm si des operam, ut cum ratione infanias.”

“ Things thus uncertain, if by reason's rules
You'd certain make; it were as wife a task
To try with reason to run mad.” *COLMAN.*

Bayle depreciates the practical philosophy of *Zeno*, on account of his vindication of the warmth with which he resented reproach, by saying, “ If I were indifferent to censure, I should also be indifferent to praise.” His works, though unknown to the moderns, were held in high estimation among the ancients. *Diog. Laert.* Bayle. *Brucker* by *Enfield*, vol. i.

ZENO, the founder of the *Stoic* sect, was born about the year 366, before Christ, and died, as it is said, in the 1st year of the 129th Olympiad, or 264 B.C. For an account of him, see the article *STOICS*.

ZENO, Roman emperor of the East, was a descendant of an Iaurian family of distinction, and at first bore the name of “ *Trafalissæus*.” Being a commander of the Iaurian troops in the service of *Leo I.*, he married *Ariadne*, a daughter of the emperor, who created him a patrician, and raised him to the chief command of all the armies in the East. Upon the death of *Leo* in the year 474, the empire was transmitted to his grandson by *Zeno* and *Ariadne*, and *Zeno*, by the influence of the dowager-empress *Verina*, was appointed his colleague, and when the young emperor died, *Zeno* possessed the whole imperial power. But *Verina*, being incensed by his scandalous conduct,

formed a conspiracy against him, so that *Zeno* was obliged to seek refuge, first at Chalcædon, and afterwards in Iauria, his native country. *Basiliscus*, the empress's brother, who had assumed the empire, became so unpopular, that *Zeno* was restored, and the degraded emperor perished in prison. About this time the western empire terminated; and *Zeno*, receiving deputies from the Roman senate, who recognized Constantinople as the seat of universal empire, and requested the title of patrician for *Odoacer*, proclaimed king of Italy, was flattered with the title of sole Roman emperor, and commenced an amicable correspondence with *Odoacer*. The remaining period of his reign was both turbulent and inglorious. The insurrections against his government were numerous, and his temper, which was naturally severe, was thus rendered more hostile and cruel towards those whom he considered as his enemies. The irritability of his disposition proved eventually a collateral cause of his death, by aggravating a disorder in his bowels, which proved fatal in the year 491, at the age of 65, after a reign of seventeen years and three months. His widow *Ariadne* married very soon after his death. His reign was famous for the confession of faith, called the *HENOTICON*, or *Henoticum*, (which see.) *Gibbon's Hist. Rom. Emp.* vols. vi. vii. viii.

ZENO, in *Geography*, a river of Italy, which runs into the *Taro*, opposite *Fornovo*, in the duchy of *Parma*.

ZENOBIA, *Queen*, in *Biography*, was a native of *Syria*, in the third century, who claimed descent from the Macedonian kings of *Egypt*. This female was celebrated for the beauty of her person, the harmoniousness of her voice, her mental talents and literary acquirements, and her distinguished heroism and valour, as well as her modesty and chastity. “ Her manly understanding,” says *Gibbon*, after recounting her personal beauties and excellencies, “ was strengthened and adorned by study. She was not ignorant of the Latin tongue, but possessed in equal perfection, the Greek, the Syriac, and the Egyptian languages: she had drawn up for her own use an epitome of oriental history, and familiarly compared the beauties of *Homer* and *Plato*, under the tuition of the sublime *Longinus*.” She was allied by marriage to *Odonatus*, king of *Palmyra*, and delighted in those exercises of war and the chase to which he was devoted. Many of his victories have been ascribed to her military skill and valour. After the death of her husband, about the year 267, she assumed the sovereignty of the East, and governed with equal vigour and policy; so that by her success in warlike expeditions, as well as by the wisdom and firmness of her administration, she aggrandized herself in Asia, and her authority was recognized both in *Cappadocia* and *Bithynia*, when *Aurelian* succeeded to the Roman empire. Envious of her power, and determined to dispossess her of some of the rich provinces that were comprehended within the extent of her dominion, he marched at the head of a powerful army to Asia, and having defeated the queen's general *Zabdas*, near *Antioch*, she retreated to *Emesa*, whither she was pursued by *Aurelian*. Under the walls of that city another engagement with *Zenobia*, which was commanded and animated by herself, took place, in which the emperor was again victorious. The queen, thus unfortunate, withdrew the relics of her vanquished forces to *Palmyra*, her capital; and was pursued thither by *Aurelian*. The favourable terms that were offered to *Zenobia* being refused, the city was besieged; which, after long resistance, the queen determined not to surrender; but as she apprehended famine within the walls, she mounted a swift dromedary, and hastened towards the *Euphrates*, with a view of seeking an asylum in the *Persian* territories. But being overtaken in her flight, she was brought back to *Aurelian*,

who

who received her with a stern countenance, and questioned her how she could dare to refit the emperors of Rome. She replied, "Because I could not acknowledge as such a Gallienus and others like him; but I recognize by that title you who know how to conquer." At Emefa, the fate of Zenobia was submitted to the judgment of a tribunal, at which Aurelian presided; and the Roman soldiers demanded her death. She, in a manner unworthy of her former fame, saved her own life by throwing the blame of her resistance on her ministers and counsellors; Longinus was one of these, who, with several others, was put to death, in the year 273.

Zenobia was referred to grace the triumph of Aurelian; and on the appointed day she preceded, on foot, a magnificent chariot, which she had designed in the days of her prosperity for a very different kind of entry into Rome. She was encircled, it is said, with chains of gold, and almost sunk under the load of jewels with which she was adorned. Afterward she was treated with humanity by the victor; and had assigned to her an agreeable residence near the Tiber, where she passed the remainder of her days as a Roman matron. Whether she contracted a second marriage with a Roman senator, as some have affirmed, is uncertain; but however this be, her surviving son Vhaballat withdrew into Armenia, and possessed a small principality granted to him by the emperor, and her family was not extinct in the fifth century. Gibbon's Hist. of Rome, vol. ii.

ZENOBIA, *Zelebi*, in *Ancient Geography*, a town of Asia, in the Euphratenus, upon the banks of the Euphrates, five miles from fort Mambri, and on this side of the small town of Sura. According to Procopius, it was founded by Zenobia, wife of Odonatus, prince of Palmyra. After it had been ruined, Justinian re-established it, and re-peopled it, and made it one of the bulwarks of the empire. After having rebuilt the town and fortified it, he embellished it, constructing magnificent churches, public baths, galleries, and lodgments for the soldiers. It was situated S.E. of Nicephorium.

ZENOBIA, a place of Italy, near the palace of Adrian, assigned to queen Zenobia for her residence.

ZENOBII INSULE, the name of seven islands in the Indian ocean, upon the coast of Arabia Felix, at the entrance of the Sathalite gulf. Ptolemy.

ZENODOTIUM, a town of Asia, in Ofrhoené, in the vicinity of Nicephorium, according to Appian. Steph. Byz. This town, says Plutarch, was forcibly taken by Crassus, who ruined it, and sold the inhabitants by auction.

ZENONIS CHERSONESUS, a town mentioned only by Ptolemy, and placed by him in the Tauric Chersonesus, along the western coast of the Palus Mæotis. M. Peyssonnel thinks this was not a town, but an isthmus, called at present Zeniské.

ZENSON, in *Geography*, a town of Italy, in the Trevisan; 9 miles E.N.E. of Trevisio.

ZENSUS, in *Arithmetic*, a name which some authors give to a square number, or the second power.

The higher powers they call *zenizenjus*, *zenzicubus*, *zenfszenzenjus*, *zenfsurdesolidus*, &c. See POWER.

ZENTA, in *Geography*, a town of Hungary, on the river Theys; memorable for a signal victory obtained, in the year 1697, by prince Eugene, over the Turks, commanded by the emperor Multapha II. in person: 20,000 Turks were killed, 10,000 wounded, and 3000 taken prisoners; 52 miles N. of Belgrade.

ZENTA, a district of Dalmatia, on the confines of Albania.

ZENTILMANDAIK, a town of Asiatic Turkey, in Natolia; 8 miles N. of Eregrî.

ZENUPH, in the *Jewish Antiquities*, a kind of tiara worn by the kings of Judah. See CIDARIS.

ZEOBID, in *Geography*, a town of the Arabian Irak, on the Euphrates; 28 miles S. of Bagdad.

ZEOLITE, in *Mineralogy*, a mineral so named by Cronstedt, from the Greek word *ζέω*, to foam, on account of its intumescing and foaming very much before the blow-pipe. Häuy makes two distinct species of the zeolite, which he denominates mesotype and stilbite. Werner makes four sub-species of zeolite, which he calls mealy zeolite, fibrous zeolite, radiated zeolite, and foliated zeolite. Besides this he makes zeolite a generic name, placing it at the head of what he calls the zeolite family, in which arrangement he is followed by professor Jameson, who classes with the zeolite family the following minerals: prehnite, (see PREHNITE,) zeolite, apophyllite, cubicite, called by Häuy analcime, chabasite, cross-stone, laumontite, dipyre, natrolite, and wavelite. (See WAVELLITE.) In the classification of specimens at the British Museum, these minerals, so nearly allied in chemical composition, and in many of their external characters, are arranged together under the appropriate denomination of zeolitic substances, by which the confusion incident on making the same word represent both a genus and species is avoided. These substances, except wavelite, are composed of siliceous, alumine, lime, or an alkali, and a considerable portion of water. To the latter, they owe the property of intumescing before the blow-pipe, that many of them possess. Some of these minerals form a jelly when dissolved in acids. Zeolitic minerals occur principally in the cavities of volcanic and basaltic rocks. Of the different members of the zeolite family, prehnite has been already described. (See PREHNITE.) Zeolite, comprising mealy zeolite and fibrous and radiated zeolite, are the various mesotypes of Häuy, mealy zeolite being the *mesotype alterée aspect terreux* of the French mineralogist. This mineral is white, inclining to yellowish, greyish, or reddish, and is sometimes red. It occurs massive, and kidney-shaped, and coralloidal. Sometimes it forms a crust over other zeolites. The lustre is dull or feebly glimmering; it is opaque, very soft, and rather brittle; it has an earthy fracture, sometimes inclining to fibrous. It is very light, and easily frangible, and feels rough and meagre. It appears to be zeolite in a decomposing state. It intumescs before the blow-pipe, and forms a jelly with acids. The constituent parts are,

Silex	-	-	-	-	60
Alumine	-	-	-	-	15.6
Lime	-	-	-	-	8
Oxyd of iron	-	-	-	-	1.8
Loss by exposure to heat	-	-	-	-	11.6

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Fibrous Zeolite, Mesotype; Häuy, is of a snow-white colour, passing to greyish, yellowish, or reddish-white, and sometimes into red and yellowish-grey, yellowish-brown, or ochre-yellow. It occurs massive, in kidney-shaped balls, and in capillary crystals. The external surface of the kidney-shaped varieties is rough and dull; internally it is strongly glimmering, passing into glittering, and the lustre is pearly: it is faintly translucent. The structure of this mineral is fibrous, either diverging on one side or stellular, and passes from delicately fibrous to coarse or to narrow radiated. It is brittle, breaking into splintery or wedged-shaped

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shaped fragments; it yields easily to the knife. The specific gravity is from 2.158 to 2.197. Before the blow-pipe it intumesces, and forms a jelly with acids. It may be distinguished from needle zeolite by its inferior lustre, fibrous structure, and low degree of transparency and hardness, and also by its want of regular crystallization.

Needle Zeolite, Mesotype, Häuy; and prismatic mesotype of some mineralogists. Its colours are, greyish, yellowish, or reddish-white: it occurs both massive and crystallized. The crystals are acicular-rectangular four-sided prisms, terminated by low four-sided pyramids, the faces of which are set on the lateral planes of the prism. Sometimes there are only two terminating planes, forming an acute bevelment, set on obliquely. The rectangular prism is sometimes truncated on the edges, forming an octahedron, with four large and four small planes. The lateral planes of the crystals are longitudinally striated, but the acuminating planes are smooth. Sometimes the crystals are diverging, and sometimes promiscuously aggregated. The crystals are externally shining or splendid, internally glistening; the lustre is vitreous, inclining to pearly. The structure is lamellar, with joints parallel to one of the sides of the prism; also at right angles to the axis, and parallel to the two diagonals of the prism. Of these, the first cleavage only is generally visible. The cross fracture is imperfectly conchoidal; the lustre between vitreous and pearly. It is translucent or transparent, with double refraction. It yields to the knife, but scratches calcareous spar, and is brittle. The specific gravity varies from 2.17 to 2.27. This mineral, like the preceding, intumesces before the blow-pipe, and gelatinizes with acids. It becomes electric by heat; the extremity of the crystal, terminated by a pyramid or bevelment, shews positive the bottom of the crystal negative electricity. According to Vauquelin, the constituent parts of mesotype are,

Silice	50.24
Alumine	29.50
Lime	9.46
Water	10
	99.2

Needle zeolite, or mesotype, is distinguished from radiated zeolite, or stilbite, by its vitreous lustre, distinct prismatic concretions, and greater transparency and brittleness. The latter has also more of a nacry lustre.

Radiated Zeolite, Stilbite, Häuy, is generally of a yellowish or greyish-white colour, and rarely passes into reddish-white or red. It occurs massive in angular pieces, and globular, and also crystallized in broad, rectangular, four-sided prisms, rather acutely terminated by four planes set on the lateral edges of the prism. Of these planes two adjoining ones are more inclined to the axis of the prism than the other two. The summits of the terminating planes are sometimes more or less deeply truncated. Sometimes the prism is so thin as to form a long six-sided table, bevelled on the shorter terminal planes. The crystals are aggregated in diverging radii, and frequently so closely joined to each other, that the pyramidal terminations of each crystal are only visible. The broader lateral planes of the crystals are smooth, and the smaller longitudinally striated. The structure is lamellar, with joints in one direction, parallel to the axis of the prism. The surfaces of the broader lateral planes are splendid and pearly; internally the lustre is more or less shining, and is pearly. The crystals are translucent, or semi-transparent. The diverging

radii of the aggregated crystals are more or less broad, passing from fibrous to foliated. It is brittle, and the fragments are wedge-shaped and splintery. Stilbite scratches calcareous spar. The specific gravity of this mineral is from 2.13 to 2.16. It intumesces before the blow-pipe, yielding a phosphoric light: it becomes white when laid on a glowing coal: it does not gelatinize with acids. The constituent parts are,

Silice	40.98
Alumine	29.09
Lime	10.95
Water	16.50
	97.52

Foliated Zeolite, Stilbite, Häuy.—The colours of this mineral are nearly the same as those of the preceding, being chiefly yellowish and greyish-white, and rarely milk-white, snow-white, reddish-white, or red; it sometimes is yellowish-grey, and pinchbeck-brown. It occurs both massive, disseminated, globular, amygdaloidal, and crystallized. The form of the crystals is a low, very oblique, four-sided prism; sometimes truncated on the acute lateral edges, and also on the angles of the acute lateral edges. Sometimes all the angles are truncated. It occurs also in low six-sided prisms, and equi-angular six-sided tables; also in eight-sided prisms. The crystals are generally small; the lateral planes are transversely striated, and the terminal planes are smooth. It has a pearly lustre, which is either shining or splendid. The pinchbeck-brown variety has a semi-metallic lustre. It has a foliated and slightly curved structure, with a single cleavage, parallel with the terminal planes of the prisms. Sometimes a conchoidal cross fracture may be observed. It is brittle, and the fragments are angular and blunt-edged, and sometimes tabular. The massive varieties are strongly translucent; the crystals are translucent, semi-transparent, or transparent. It yields to the knife, but scratches calcareous spar. The specific gravity of this mineral is 2.2; and, like the preceding mineral, it intumesces and melts before the blow-pipe, giving out a phosphoric light: it does not form a jelly with acids. According to Meyer, the constituent parts are,

Silice	58.3
Alumine	17.5
Lime	6.6
Water	17.6
	100

According to Vauquelin,

Silice	52.6
Alumine	17.5
Lime	9
Water	18.5
	97.6

All these zeolitic substances, classed as mesotype and stilbite by Häuy, pass by imperceptible gradations into each other, and occur, as we have before observed, in basaltic and volcanic rocks.

The easy fusibility of zeolites was at one time regarded as rendering their occurrence in volcanic rocks a subject of difficult explanation; but the experiments of Sir James Hall, referred to under SYSTEMS of Geology, demonstrate

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the possibility of crystalline arrangements taking place under compression in substances that would be dissipated by heat under the common pressure of the atmosphere. It is probable, however, that many zeolitic substances which occur in basalt or lava have been infiltrated into the cavities at a later period, and are even forming at the present day in ancient lavas and basalts.

Some of the minerals classed with the zeolite family have been described in our preceding volumes. See *APOPHYLITE*, or *ICTHYOPHTALMITE*.

Analcime, or *Cubicite*, formerly called by Werner *cubic zeolite*, is generally white, sometimes reddish-white, or red. It occurs sometimes massive, but more generally crystallized in perfect cubes, or with the angles more or less deeply acuminate, or in twenty-four-sided crystals, like those of the leucite, having each of the sides equal and similar trapeziums. The structure presents slight indications of cleavage, parallel with the sides of a cube. The fracture is compact and flatly conchoidal, passing into fine-grained, uneven. It is translucent, semi-transparent, or transparent, and has a shining lustre, between vitreous and pearly. It is sufficiently hard to scratch glass, but is easily frangible. The specific gravity of cubicite is 2.44. It becomes electric by rubbing. Before the blow-pipe it melts into a transparent glass. According to Vauquelin, the constituent parts of this mineral are,

Silice	-	-	-	-	58
Alumine	-	-	-	-	18
Lime	-	-	-	-	2
Soda	-	-	-	-	10
Water	-	-	-	-	8.5
					96.5

This mineral occurs most frequently in cavities in rocks of the trap formation, accompanied with zeolite; but it is sometimes found in metallic veins in schistose rocks, accompanied with various ores, and with calcareous spar and quartz. The name *analcime* was given to it by Häuy, signifying a body with little power, on account of the feeble electricity excited in it by friction.

Chabasite, *Chabasie*, Häuy, is nearly allied to cubicite, and was formerly classed with it. The crystallization is different; the form is not perfectly cubical, but slightly rhomboidal, the angles of the rhomboid being 94° and 86°, either perfect, or with the obtuse lateral edges truncated, and sometimes both the six obtuse lateral edges and six obtuse angles are truncated. The crystals are transparent or translucent. The lustre is vitreous, and externally splendid, internally glistering; the fracture is imperfectly conchoidal, or fine-grained, uneven. It scratches glass a little. The specific gravity of this mineral is 2.7. It is fusible into a white spongy enamel. According to Vauquelin, the constituent parts are,

Silice	-	-	-	-	43.33
Alumine	-	-	-	-	22.66
Lime	-	-	-	-	3.34
Soda with potash	-	-	-	-	9.34
Water	-	-	-	-	21
					99.67

The situation in which this mineral occurs is nearly the same with that of analcime. The name was given it by Häuy, from chabazion, an unknown stone mentioned in the poems of Orpheus.

Laumontite, *Zeolithe efflorescente*, Häuy.—Its colours are, yellowish-white, snow-white, and greyish-white. It occurs massive and crystallized in octahedral prisms, with edges apparently rounded; the summits of the crystals are dihedral. The crystals are small, lining drusy cavities. The structure is lamellar, and has a two-fold cleavage: it is transparent or translucent when fresh; but on exposure to the atmosphere soon becomes opaque, losing its hardness, and yielding to the pressure of the finger. When fresh it scratches glass. The specific gravity is 2.23. Bournon. It forms a jelly with acids. Before the blow-pipe it intumesces, and is changed into a white enamel. According to Vogel, the constituent parts are,

Silice	-	-	-	-	49
Alumine	-	-	-	-	22
Lime	-	-	-	-	9
Water	-	-	-	-	17.5
Carbonic	-	-	-	-	2.5
					100

This mineral, which agrees in its principal characters with zeolite, was first found in Brittany, by M. Gillet Laumont, after whom it has been named by Werner. It has been found also at Paisley, in Renfrewshire, in amygdaloid, accompanying cubicite. Laumontite disintegrates so rapidly, that for its preservation it requires to be kept in well-closed bottles.

Crofs-Stone, *Harmotome*, Häuy, occurs in small crystals: the form is generally a broad rectangular prism, terminated on each extremity by four rhombic faces, with their acute angles set in the lateral edges of the prism. Sometimes the edges of the rhombic faces are bevelled in one direction. But the name *crofs-stone* is derived from the frequent occurrence of two prisms intersecting each other, having one common axis. The broader planes by this intersection project, and form the figure of a cross when the prism is viewed at the end, or in the direction of the axis. The colour of *crofs-stone* is generally a greyish-white, which passes into smoke-grey: it is sometimes a yellowish-white, passing into cream-yellow, and red. It is translucent or transparent, with a lustre between vitreous and pearly. The fracture is uneven, or imperfectly conchoidal. It is supposed, by professor Jameson, to have an imperfectly foliated structure. It scratches glass feebly. The specific gravity is 2.33. Before the blow-pipe it emits a yellowish phosphoric light, and melts with intumescence into a colourless glass. It does not gelatinize with acids. This mineral differs from other members of the zeolite family, by containing barytes as an ingredient in its composition. According to Klaproth, its constituent parts are,

Silice	-	-	-	-	49
Alumine	-	-	-	-	16
Barytes	-	-	-	-	18
Water	-	-	-	-	15
					98

Dipyre, Häuy; *Schmelzstein*, Werner.—Its colours are, light pearl-grey, greyish-white, or reddish-white. It occurs massive and crystallized, in aggregated, slender, octahedral, acicular prisms. The structure is lamellar, with joints parallel to the sides, and to the diagonal of a rectangular prism. The lustre is intermediate, between vitreous and pearly: it is translucent. This mineral is sufficiently hard to scratch glass; but is very frangible. The specific gravity

vity is 2.630. Before the blow-pipe it intumescs, and melts with great ease, giving out at the same time a phosphoric light from this double effect of heat upon it. Håüy gave it the name of *diypre*, on account of its easy fusibility: it was called *schmelzstein* by Werner. Its constituent parts are,

Silex	-	-	-	-	60
Alumine	-	-	-	-	24
Lime	-	-	-	-	10
Water	-	-	-	-	2
					—
					96
					—

It is said by Brongniart to occur in steatite, along with iron pyrites, near Mauléon, in the Western Pyrénées.

The other members of the zeolite family are described in the preceding volumes. See NATROLITE and WAVELITE.

ZEOPILOS, a word used by Quercetan as the name of an antimonial medicine.

ZEPHYRUM, in the *Materia Medica*, the name of the *triticum æstivum*, or *hordeum nudum*, as it is called by some authors, the naked barley.

ZEPHANIAH, a canonical book of the Old Testament, containing the predictions of Zephaniah, the son of Cushi, and grandson of Gedaliah; being the ninth of the twelve lesser prophets. He prophesied in the time of king Josiah, a little after the captivity of the ten tribes, and before that of Judah; so that he was contemporary with Jeremiah. He prophesies chiefly against Judah, who continued very corrupt, notwithstanding the king's pious zeal for reformation, and the good example he gave to his subjects.

ZEPHAT, in *Ancient Geography*. See SEPHAAT.

ZEPHIRA, in *Geography*, a small island in the Grecian Archipelago, near the N. coast of Antiparos.

ZEPHIRE, in *Ancient Geography*, an island situated on the coast of that of Crete, before the promontory Samonium. Mela.

ZEPHRON, or ZEPHRONIA. See ZIPHON.

ZEPHYRI FÆTUS, a term used by Hartman, and some other writers, to express a mole, or false conception.

ZEPHYRINUS, *Pope*, in *Biography*, succeeded Victor in the Roman see in the year 201. A persecution at the commencement of his papacy obliged him to conceal himself, and when he was at liberty to exercise his functions, he was engaged in the suppression of prevalent heresies, which disturbed the latter years of his pontificate. He died in the year 218 or 219. Bower.

ZEPHYRIUM, in *Ancient Geography*, a promontory of Asia, on the confines of Cilicia Propria. According to Strabo and Ptolemy, this promontory and that of Sarpedon formed the mouth of the river Calycadnus.—Also, a town at the extremity of this promontory.—Also, a promontory of the isle of Cyprus, towards the S.W., at the extremity of a peninsula, which on the W. incloses the gulf, at the bottom of which was Paphos.—Also, a promontory of Italy, on the eastern coast of Brutium, between the promontory of Hercules and the town of the Locri. Strabo.—Also, a promontory of Africa, in the Cyrenaica, upon the coast of the Pentapolis. Ptolemy. Strabo distinguishes two promontories of this name on the coast of Cyrenaica.—Also, a town of Asia, on the coast of Paphlagonia.—Also, a town of Asia, in the interior of Cappadocian Pontus. Arrian gives it a port, and states it to be 120 stadia from the isle of Arrenthias, and 90 stadia from the town of Tripolis.—Also,

a promontory on the coast of Egypt, between Campé and Alexandria, where was a chapel of Venus Arfinoe, and hence she took the name of Zephritis.—Also, a promontory of Asia Minor, on the coast of Caria, in the vicinity of the town of Myndus. Strabo.—Also, a town of the Tauric Chersonesus; situated on the sea-coast, N.E. of Theodosia. Pliny.—Also, a promontory on the eastern coast of the isle of Crete.

ZEPHYRIUM *Jugum*, a sacred mountain of Hispania, upon which was a fortress.

ZEPHYRUS, or ZEPHYR, Ζεφύρος, the west wind; a wind blowing from that cardinal point of the horizon opposite to the east.

The poets personify it, and represent Zephyrus as the mildest and most gentle of all the deities of the woods: the character of his personage is youth and gentleness.

It is also called *Favonius*, and *occidens*; and, by many, has been confounded with the *Africus*. See WIND.

ZEPS, in *Geography*, a town of the duchy of Warfaw; 20 miles E. of Wladislaw.

ZERA, a town of Italy, in the Veronese; 7 miles S. of Verona.

ZERANIA REGIO, in *Ancient Geography*, a country of Thrace. Steph. Byz.

ZERBITA, in *Geography*, a town of South America, in the government of New Grenada; 30 miles W.S.W. of Pamplona.

ZERBST, a town of Germany, in the principality of Anhalt Zerbit. It is the residence of the prince, and the largest and handsomest town in the whole principality of Anhalt. The residence-house here is remarkably grand. In the town are two Lutheran churches, one of which is used by the Calvinists, together with an university; common to all the princes of Anhalt, and founded in 1582, out of a school: it has a rector, with three Calvinist and one Lutheran professors. The principal trade is in beer, with manufactures of gold and silver; 8 miles N.N.W. of Dessau. N. lat. 52° 3'. E. long. 12° 10'.

ZERDA, in *Zoology*, a name given by the Moors to an animal which inhabits the desert of Sahara, extending beyond mount Atlas.

This is the *canis circo* of Linnæus, with a straight tail, a palish or yellowish-white body, with prolonged upright ears, internally rofe-coloured. It is the fennec of Bruce, and a beautiful African and Asiatic animal, and is principally found in Arabia.

Pennant classifies it under the genus of dog; and describes it as having a pointed visage, long whiskers, large bright black eyes, very large ears of a bright rofe colour, internally lined with long hairs, and orifice fo small, as not to be visible, probably covered with a valve or membrane; legs and feet like those of a dog, and taper tail; its colour is between a straw and pale brown; its length from nose to tail ten inches, its ears three inches and a half long, tail six, and height not five. It burrows in the sandy ground, and is fo excessively swift, that it is very rarely taken alive; feeds on insects, especially locusts; fits on its rump; is very vigilant; barking like a dog, but with a shriller sound, and chiefly in the night; and is never observed to be sportive.

M. Buffon says of this animal, that it is found to the south of the Palus Tritonides, in Lybia; that it has something of the nature of the hare, and something of the squirrel; and that it lives on the palm-trees, and feeds on the fruits: hence probably it derives its name fennec from φοῦξ, a palm-leaf. Bruce's Travels, vol. v.

ZERDUSHT, in *Biography*. See ZOROASTER.

ZEREA, in *Geography*, a town and fortrefs of Perfia, in Fariftan: this town was taken by the troops of Timur Bec, with great slaughter; 18 miles N.N.E. of Schiras.

ZEREB, a town of Perfia, in the province of Segeftan; 130 miles N.W. of Zarang.

ZEREWICA, a town of Lithuania; 5 miles S.W. of Slonim.

ZERIB, a town of Kurdiftan; 25 miles W. of Gulamerik.

ZERICHUM, a name given by fome of the chemical writers to arsenic.

ZERKI, in *Geography*, a town of Kurdiftan; 30 miles S.W. of Betlis.

ZERKWITZ, a town of Lufatia; 2 miles W. of Lubbenau.

ZERMA. See SURMA.

ZERMAGNA, a river of Dalmatia, which runs into the Adriatic, oppofite Pago.

ZERMONY, a town of Lithuania; 10 miles N.W. of Lida.

ZERNA, a mountain of Carinthia; 3 miles N.W. of Milltatt.

ZERNA, a word ufed by fome of the chemical writers to exprefs an ulcerated lepra or impetigo. The chemical authors ufe it alfo as a name for the foulnefs which they call the *lepra metallorum*, or leprofies of metals.

ZERNEMBL, or TSCHERNEMBL, in *Geography*, a town of the duchy of Carniola, on a small river which runs into the Kulpa; 4 miles S.S.W. of Rudolfswerth. N. lat. 45° 50'. E. long. 15° 5'.

ZERNESIUM COLONIA, in *Ancient Geography*, a colony of Dacia, founded by Trajan.

ZERNETZ, in *Geography*, a town of Switzerland, in the Upper Engadine. In the late war it was taken by the French, and foon after retaken by the Auftrians; 8 miles N. of Zultz.

ZERNITZ. See CZERNETZ.

ZERO, a river of Italy, which runs into the fea, 7 miles N. of Venice.

ZERO, denotes the point from which the fcale of a thermometer is graduated. Thus Celfius's and Reaumur's thermometers have their zero at the freezing-point, while the thermometer of Fahrenheit has its zero at that point at which it ftands when immerfed in a mixture of fnow and common falt. In Wedgwood's pyrometer, the zero corresponds with 1077° of Fahrenheit's, each degree of which is equal to 130° of Fahrenheit. Confequently 180° Fahr. = 100° Celf. = 80° Reaum. = 150° De Lifle = $\frac{1}{2}$ Wedgw. See THERMOMETER.

ZEROGERE, in *Ancient Geography*, a town of India, on this fide of the Ganges, E. of the river Namadus. Ptolemy.

ZEROWITZ, in *Geography*, a town of Bohemia, in the circle of Bechin; 3 miles W.S.W. of Potfehaken.

ZERREH, or ZURRAH, *Lake of*, a lake of Perfia, in the province of Seiftan or Segeftan, into which the river Heermund, or *Hindmund*, (the ancient Etymander,) navigable for boats from Bolt to Zarang, flows through the centre of it, from the mountains of Huzara, beyond Cabul. This lake is faid to be 30 furlongs in length, and 6 in breadth, or about 100 miles long, and 20 broad at the wideft part. It is principally formed by the waters of the rivers Heermund and Ferrah, and in the dry feafon refembles more a marfh than a lake, being covered with rufhes and reeds. In the middle the water is fresh; but brackifh towards the fhore, as the fandy plains which furround it are

impregnated with falt. The lake is full of fifh and wild fowl; and in its centre there is a fortified town, called "Kookhozerd," built on a high ifland, where the treasure of the principal families of Seiftan ufed to be deposited when the province was invaded. It is faid that on the borders of this lake is a town named "Naffarabad," which is defcribed as being four days' journey for a loaded camel, W. of the city of Doolhak, the prefent capital of the province.

ZERTA, or SERTA, the *Zerte*, or *Serte*, in *Ichthyology*, a fifh caught in the rivers of Italy, and fome other places, of the figure of the chub, and called by authors *capito anadromus*, and the *blike*. It feldom grows to more than ten pounds weight, and at times lives in rivers, at times in the fea; and is eftemed a very well tafted fifh, efpecially a little before the feafon of its fpawning, either fresh, falted, or prepared in various ways by pickling, &c.

The *zerte* is that fpecies of cyprinus defcribed by Gefner and others under the name of *capito anadromus*. See CYPRINUS *Vimba*.

This is the filvery-blueifh carp, olivaceous above, with the dorsal, caudal, and anal fin blueifh, the reft reddifh, and the nofe protuberant. It is a native of Germany, Ruffia, Sweden, and other parts of Europe, inhabiting rivers, and migrating into the Baltic fea.

ZERVINKA, in *Geography*, a town of Servia, on the Danube; 10 miles N.W. of Belgrade.

ZERUIS, in *Ancient Geography*, a town of Thrace, on the route from Dyrrachium to Byfance, between Dymæ and Plotinopolis. Anton. Itin.

ZERUMBET, in *Botany*, a name firft ufed by Serapio, and apparently either of Arabian or Indian origin. It belongs to one of the aromatic roots of the natural order of *Scitamineæ*, the produce of the Eaft Indies, but rather to a *Kempferia*, than to the fpecies of Ginger to which Linnæus has applied it. (See ZINGIBER.) Dale has very juftly obferved on this fubject, *Pharmacologia*, 275, that in the prefent inftance, as well as innumerable others, the Arabian writers are fo brief, as well as vague, in their defcriptions, and fo contradictory amongst themfelves, that we can fcarcely tell whether they were acquainted with any particular object or not.

Wendland, Jaquin, and Poiret, (Lamarck Dict. v. 8. 857,) have moft accurately made a genus of *Alpinia nutans*, and called it *Zerumbet*; but this cannot on any principle be maintained.

ZERYNTHUS, in *Ancient Geography*, a town of Thrace, which had a cavern of the fame name, and which the ancients called Zerynthium Antrum. This cavern was confecrated to Hecate, to whom they facrificed dogs. Suidas.

ZERZEN, in *Geography*, a town of Arabia, in Yemen; 36 miles S.E. of Ghezar.

ZESEMITZ, a town of Bohemia, in the circle of Chrudim; 8 miles N. of Chrudim.

ZESEL, a town of Silefia, in the principality of Oels; 5 miles N.E. of Oels.

ZEST, the woody thick fkin quartering the kernel of a walnut. Some phyficians prefcribe this zeft, dried, and taken with white wine, as a remedy againft the gravel.

The word is alfo ufed for a chip of orange or lemon-peel; fuch as is ufually fqueezed into ale, wine, &c. to give it a flavour; or for the fine thin oil that fpirts out of that peel on fqueezing it.

Hence, to zeft an orange or lemon, among confectioners, is to cut the peel from top to bottom into fmall flips, as thin as poffible; or, to zeft, is to fqueeze the peel over the furface of any thing.

ZESTO-

ZESTOLUSIA, a term used by some medical authors to express bathing in warm water, by way of distinction from *psuchrolusia*, or bathing in cold water.

ZETA, or **ZETECULA**, a little closet, or withdrawing chamber, with pipes running along the walls, to receive from below either the cool air, or the steam of warm water.

The word is formed either from ζῆτος, to be warm; or of ζῆν, vivere, to live, on account of the use made hereof for love and enjoyment.

ZETA, or **Zetta**, (*Menzil*), in *Ancient Geography*, a town of Africa Propria, situated near the sea, E. of Vicus Angulii.

ZETETÆ, Ζητηταί, among the Athenians, were officers appointed upon extraordinary occasions, to inquire after the public debts, when, through the neglect of the receivers, or by other means, they were run up to large sums, and began to be in danger to be lost, if not called in.

ZETETICE, Ζητητικῆ, formed from ζῆτος, I seek, or zetetic method, in *Mathematics*, the method made use of to investigate or find the solution of a problem.

The ancient Pyrrhonians were sometimes called *Zetetici*, q. d. *seekers*.

ZETIN, in *Geography*, a town of Croatia; 28 miles W.N.W. of Novi.

ZETLAND, or **SHETLAND**, the name of a cluster of islands, situated in the Northern ocean, between the 59th and 62d degrees of N. latitude, and a very little to the W. of the meridian of London. The most southern part is nearly 100 miles N.N.E. from the northern county of Scotland. These islands exceed one hundred in number, of which only thirty-four are inhabited; the others, consisting chiefly of rocks and sands, are unfitted for human support. By different writers, they have been named Hethland, Hialtland, Zetland, Schetland, and Shetland; which names, Dr. Edmondston says, "are of Norwegian origin, and are supposed to be descriptive of their form or appearance." The most correct and approved orthography is that of Zetland. The general appearance of these islands is bleak, bare, and rocky; but some interior parts of the main-land are cultivated, clothed, and cheerful. In many places on the coasts, rocks of immense size are seen to rise above the foaming waves, some of which are at considerable distance from the shores. Some of these are also perforated by vast natural arches; in other parts there are deep caverns and subterranean recesses. Two of these are called the Seranda, one of which extends above 300 feet in depth. Almost all the large islands are deeply intersected by tortuous bays, or voes, as they are provincially called, which afford facilities for internal communication, and excellent harbours for vessels. Several of them are commodious, and well sheltered from dangerous winds. Some of the islands have lakes, the largest of which is not more than two miles in length. The highest hill is Mons Ronaldi, in the parish of North-maven; the height of which, from barometrical measurement, is 3944 feet above the level of the sea. Some of the headlands are lofty and grand, one of which, Nofs-head, is above 600 feet in height.

According to the population reports of 1811, the following is the enumeration of houses and inhabitants, and the names and number of parishes. The total number of houses 8230, inhabited by 9038 families, 16 houses building, and 101 unoccupied. The whole population was 46,153, consisting of 20,151 males and 26,002 females. The parishes are, 1. Aithking and Sandfing; 2. Bressay, Burra, and Quarff; 3. Delting; 4. Dunrossness, Sandwick, Cunnibrough, and Faria isle; 5. Lerwick and Gulberwick;

6. Lunnasting, Nesting, Skerries, and Whalfay; 7. North-mavine; 8. Tingwall, Whiteneffs, and Weifdale; 9. Unft; 10. Walls, Sandness, Papa, and Fonta; 11. Yell (North) and Fellar; 12. Yell (South and Middle).

As the chief histories and topographical peculiarities of the Zetland islands have been fully detailed under the words **MAINLAND**, **LERWICK**, and **SCALLAWAY**, the reader is referred to each word respectively.—A View of the ancient and present State of the Zetland Islands, by A. Edmondston, M.D. 2 vols. 8vo. 1809.

ZETLAND Islands, *Forula* or *Fula*, the most western of the Shetland islands, and is supposed to be the "Ultima Thule" of the ancients. It is about three miles long and one and a half broad, nearly twenty miles distant from any land, W. of the clusters of Orkney and Shetland, to which it is politically annexed: it affords excellent and extensive pasture for sheep; and is inhabited by 26 or 27 families.

ZETTERITZ, a town of the principality of Culmbach; 11 miles S.W. of Culmbach.

ZETUS, a word used by some of the chemical writers as a name for vitriol.

ZEVACO, in *Geography, a small island in the Pacific ocean, near the coast of Veragua. N. lat. 8°. W. long. 81° 46'.*

ZEVEN. See **CLOSTER Seven**.

ZEVENAER. See **SEVENAER**.

ZEUF, or **GAER**, a town of the kingdom of Balk; 100 miles S.E. of Balk.

ZEUGITÆ, Ζευγίται, among the Athenians, the third class of the people, or those who had an estate of two hundred medimi.

ZEUGITES, in *Botany*, an ancient name, adopted by Browne, but no otherwise applicable to the present genus, than as far as concerns its reedy habit. The *Zeugites* of Pliny was a large Bœotian reed, so called from ζυγος, a yoke, because it was bound together, in portions of different lengths, to make the pastoral pipes; as wheat straws are, by our shepherd's boys, to this day; but the West Indian grass, of which we are now to give an account, has not even this coincidence with the original.—Browne Jam. 341. Schreb. Gen. 810. Willd. Sp. Pl. v. 4. 204.—Class and order, *Monocia Triandria*. (Rather *Triandria Dignia*.) Nat. Ord. *Gramina*, Linn. Juss.

Gen. Ch. *Common Calyx* a glume of two valves; the outer one broadest, concave, abrupt and jagged, ribbed; membranous at the edges; the inner narrower, sharper and keeled. *Male Florets* two, smallest, on a common stalk the length of the solitary female floret, within the common calyx. *Perianth* none. *Cor.* Glume of two ovate-oblong, compressed, bluntish, awnless, equal valves. *Stam.* Filaments three, capillary, the length of the corolla; anthers oblong, cloven at each end.

Female within the larger glume of the common calyx, sessile. *Perianth* none. *Cor.* Glume of one oblong concave valve, twice the size of the calyx, bordered towards the top with a dilated membrane, awned; the awn terminal, capillary, straight, half as long again as the glume. *Pist.* Germen oblong; style divided; stigmas long, shaggy. *Peric.* none. *Seed* solitary, oblong.

Obf. Schreber remarks, that this grass differs so entirely, in every character, from *Apluda*, with which Linæus combines it, that they are totally irreconcilable. We should refer both, with all other true *Gramina*, as in *Pl. Brit.* to the class *Triandria*.

Ess. Ch. *Common Calyx* of two valves, with three flowers; the female one sessile; the males stalked. Corolla

of the males of two beardless valves; of the female of one awned valve. Style divided. Seed oblong.

1. *Z. americanus*. Jamaica Yoke-grass. Willd. n. 1. (*Z. arundinaceus*, ramifusus, minor, rufescens; paniculâ sparsâ terminali; Browne Jam. 341. t. 4. f. 3. *Apluda* Zeugites; Linn. Sp. Pl. 1487. Amcen. Acad. v. 5. (not 6), 412. Swartz Obs. 384.)—Native of Jamaica. Found by Dr. Browne at Cold-spring, in the mountains of New Liguanea, in a rich soil, and shady situation. His original specimens are in the Linnæan herbarium. The root is said to be perennial. Stem two feet high, much branched, ascending, round, jointed, polished, brownish, leafy, rather slender. Leaves alternate, on slender stalks, each with a long sheathing base, reclinate, or nearly pendulous, ovate, acute, entire, smooth, many-ribbed, from an inch to an inch and a half long, and from half an inch to an inch broad. Panicles terminal, from the sheaths of the uppermost leaves, compound, spreading, with smooth slender branches. Glumes green, striated, smooth. The habit is no less foreign to the genus *Apluda* than the generic characters.

ZEUGMA, *Ζεύμα*, literally denoting a joining together; from *ζεύω*, I join, a figure in Grammar, whereby an adjective, or verb, which agrees with a nearer word, is also, by way of supplement, referred to another more remote.

Thus Terence, "Utinam aut hic furdus, aut hæc muta facta sit." So Virgil, "Hic illius arma, hic currus fuit." In which cases, the words *facta sit* agreeing primarily with *hæc muta*, are also made to agree or extend to *hic furdus*: and the verb *fuit* is not only referred to *hic currus*, which it properly respects, but farther to *hic illius arma*.

Of this species of ellipsis, which differs from the ellipsis properly so called, in that the word which is to be understood once or oftener, has been already mentioned, Messieurs De Port Royal enumerate three sorts; viz. when we repeat the noun or verb in the same manner it has been already expressed; or when the word expressed cannot be repeated without receiving some alteration in gender, case, number, or person; or when, after a word which includes the whole, a distribution of the parts is made without repeating the verb. Latin Gram. vol. ii. p. 183.

The Latins, it may be here observed, take a liberty in constructions, which some of the nicer critics among the moderns, particularly the French, will not allow in the modern tongues.

ZEUGMA, (*Roum-Kala*), in *Ancient Geography*, a town of Asia, or a place on the right bank of the Euphrates, S.E. of Samofata, and over-against Apamea.

ZEVICO, in *Geography*, a town of Spain, in the province of Leon; 10 miles S.E. of Palencia.

ZEVIO, a town of Italy, in the Veronese; 10 miles S.S.E. of Verona.

ZEVKETI, a town of the principality of Gurjel; 25 miles S.E. of Puti.

ZEULEN, a town of Bavaria, in the bishopric of Bamberg, on the Rotach; 21 miles N.N.E. of Bamberg. N. lat. 50° 13'. E. long. 11° 16'.

ZEULENRODA, a town of Saxony, in the county of Reussen, containing two churches and 350 houses. Here is a manufacture of stuffs, and a considerable one of stockings; 10 miles W. of Greitz. N. lat. 50° 36'. E. long. 11° 51'.

ZEUS, in *Ichthyology*, a genus of fish, of the order of the *thoracici*; the characters of which are, that the head is compressed and declining; the upper lip is arched by means of a transverse membrane; the tongue is awl-shaped; the

branchiostegous membrane has seven perpendicular rays, the lowest placed transversely; the dorsal fins, in most species, furnished with projecting filiform rays; and the body is compressed, broad, thin, and of a bright colour. The species enumerated by Gmelin and Shaw are the following:

VOMER. Silvery dory, with the second ray of the dorsal fin very long. Bloch. (See **VOMER**.) Its shape is rhomboidal, length six or eight, or more, inches, body thin, without scales, tinged on the upper parts with a blueish cast, mouth with small teeth. Native of the American seas, and sometimes seen in those of the north of Europe: eatable, but not much esteemed.

GALLUS. Silvery dory, with the tenth ray of the dorsal and second of the anal fin longer than the body. Shape and length, and body, like those of the former; back tinged with a greenish hue, head large, mouth wide. Native of the American and Indian seas, feculent: when first taken grunting, like the gunnards. The abacatuaja of Marcegrave.

FABER. Gold-green, fuliginous dory, with a dusky central spot on each side of the body, or with a rounded tail, brown spot on the middle of the sides and two anal fins. Linnæus. This is the common dory (see **DORÉE**), which is a native of the Mediterranean, Northern, and Atlantic seas. Its head is large and long; length generally twelve or fifteen inches, and weight ten or twelve pounds; mouth wide, lower jaw longer than the upper, teeth small and sharp, eyes large, body covered with small scales, and marked by a curved lateral line, which descending pretty suddenly from the gill-covers, passes on to the tail; back arched, and furnished with a row of strong, small prickles, continued along the curve of the abdomen; two very strong and sharp spines at the base of the pectoral fins. The introduction of this fish, as excellent food, to the tables of the higher ranks, is of no remote date; Mr. Quin being considered as the founder of its peculiar reputation in the polite circles. This fish is of a very voracious nature, preying on smaller fishes and their spawn, as well as various kinds of sea-insects, the smaller shell-fish, &c. It emits a noise like that of the gunnards and scorpenas, when first taken, by violently forcing out the air from its gill-covers.

APER. Reddish dory, with rough scales and even tail; a small species about three inches long, resembling the common dory in habit; snout protuberant, and turning upwards; no perceptible teeth; eyes large, with white irides; two dorsal fins, the anterior having nine strong and sharp spines, the first low and scarcely visible, the second four times longer, and the third very long and thick; the second dorsal fin consisting of twenty-three soft rays; the vent-fin having twenty-six rays, the pectoral fins about fourteen, and the ventral six. This fish generally resides at the bottom, and is accidentally taken after great storms: it is not eatable, being small, coarse, and of an unpleasant odour. It is a native of the Mediterranean.

INSIDIATOR. Silvery dory, with sides speckled with black, and narrow extensile mouth; shape rhomboidal; smaller than *Z. ciliaris*; colour bright-silvery, blueish-green above, and speckled with black points; body without scales; lower lip retractile, and mouth capable of forming a tubular snout, for ejecting a drop of water against such insects as happen to alight on or fly about the aquatic plants near the shores of the waters it inhabits, and thus obtain its prey. A native of the rivers and fresh-waters of India.

CILIARIS. Silvery dory, with some of the rays in the dorsal and anal fin excessively long; body rhomboidal, thin, without scales, and of a bright-silver colour, with a blueish

or greenish cast on the back, and small sloping; lower jaw longer than the upper; teeth small and sharp; several of the last rays of the dorsal and anal fin extending farther than the tail itself, the long and flexible filaments of which Count de Ceppe imagines attract small fishes, which mistake them for worms, the dory himself lying concealed among sea-weeds, &c. and waiting for its prey: the count also conceives that these may serve to sustain the fish by coiling round the stems of sea-plants, &c. A native of the Indian seas; but not esteemed as food, being small and coarse.

LUNA or OPAH. Dory with somewhat lunated tail; the body being generally either red, green, or purple, with oval white spots. This is a superb species, and found, probably wandering from the warmer regions, in the Mediterranean and Northern seas, the largest species of the kind, being between four and five feet in length, in colour varying from a bright silvery-green ground to a bright gold colour, and variegated on the sides with pretty numerous and moderately large oval white spots, while the fins and tail are bright scarlet; the skin seemingly destitute of scales and perfectly smooth.

Specimens of this fish have been occasionally thrown on the British coasts, one of which is described under the article **OPAH**. A dried specimen of this fish may be seen in the British Museum.

QUADRATUS. Grey dory, with transverse dusky or a cinereous body, and even tail. This fish, found in the sea that washes the coast of Jamaica, is described by Sir Hans Sloane, as five inches long and four broad in the middle, narrowing from thence gradually to the head and tail; mouth small, but with rows of small, sharp teeth; tongue round and cartilaginous; pupil large and black, in a white circle; seven fins; tail almost square; whole body clothed with grey or ash-coloured scales, having three or four transverse black lines; with a very crooked line from head to tail.

ZEUS, a species of scorpæna. See **SCORPÆNA PORCUS**.

ZEUXIS, in *Biography*, a celebrated ancient painter, who is said to have been a native of Heraclea, either in Greece or Magna Græcia, and to have commenced the practice of his art in the fourth year of the 95th Olympiad, B.C. 397. According to Quintilian, he is the first artist who understood the proper management of lights and shades, and to have excelled in colouring; but ambitious of imitating the strength and grandeur of Homer's manner, he is charged with giving unfitable bulk to the heads and massiveness to the limbs of his figures. Notwithstanding these alleged imperfections, he attained distinguished excellence; and in the prosecution of it he was attentive even to the minutest circumstance. Many instances occur in his history to this purpose. In his picture of Helen, executed for the Crotonians, as an ornament for their temple of Juno, he determined to combine every quality that might constitute a perfect beauty; and with this view he selected five of the handomest females of Crotona, and transferred to his picture, from their naked charms, an assemblage of all that were most perfect in their kind. This figure has been extolled as the finest specimen of art existing; and under it the painter, not unconscious of his merit, inscribed the lines of Homer, in which Priam expresses his admiration of the beauty of the real Helen. Every one who saw it, before it was placed in the temple, paid the painter a fee, which, added to the liberal recompense of the Crotonians, amply repaid him for his skill and labour. This enabled him to gratify his vanity by making presents of his pictures, for which no adequate price could be given. To such a degree

was he enriched by his art, that he was able to indulge his vanity by appearing at the Olympic games with his name embroidered in golden letters upon his mantle. Such were the failings of a man, who rendered his name illustrious by the supereminent exercise of his art. Among his most famous performances are enumerated a Jupiter on his throne, with the other gods standing round;—a Hercules in his cradle, strangling the serpents, Alcmena and Amphitryon witnessing the exploit with terror;—a Penelope, with an expression conformable to her character;—a Cupid crowned with roses, for the temple of Venus at Athens;—a Mariyas bound, afterwards placed in the temple of Concord at Rome;—and a group of Centaurs. The time of his death is not known; but as to the manner of it, the following whimsical anecdote is recorded; after having painted an old woman, whilst he was attentively surveying it, he was seized with such a violent fit of laughter, that he died on the spot. Pliny Hist. Nat. Gen. Biog.

ZEYA, in *Geography*, a river of Austria, which rises near Ennsprung, and runs into the March, 6 miles E. of Zilterdorf.

ZEYL. See **ZEIL**.

ZEYLAND, a small island near the coast of Lapland. N. lat. 70° 10'.

ZEYRING, a town of the duchy of Stiria; 6 miles N.W. of Judenburg.

ZEZARE, a river of Portugal, which rises in the east part of Eitremadura, and runs into the Tagus, at Tancos.

ZEZARINE, or **KIERAZIN**, a small island in the Persian gulf, hardly half a mile in length. N. lat. 28° 8'.

ZFOKEN, a town of Saxony, in the circle of Erzgebirg; 8 miles N.W. of Grunhayn.

ZHA, a river of Africa, which forms the east boundary of Fez, and runs into the Mulloioah.

ZEHOL, **ZHEHO**, or **Gebo**, a town of Chinese Tartary, in the country of the Mandshars, not far beyond the great wall, and summer residence of the emperor of China; 120 miles N.E. of Peking.

ZIA, an island in the Grecian Archipelago, anciently called "Ceos" and "Hydrassa," about 16 leagues in circumference. The inhabitants are Greeks, who have a bishop. The soil is fertile, and they have a good breed of cattle, with plenty of wild fowl, especially partridges and pigeons. The chief manufactures are, silk, camlets, and a sort of cloaks made of goats' hair. Among the productions of the island may be reckoned the velani, a species of acorn much esteemed. Of four considerable towns or cities in this island, the only one at present remaining is Carthea, or Zeia, containing about 2500 houses, with a harbour capable of receiving vessels of considerable burden, and where a whole fleet may ride in security from every gale, in every depth of water, and in very good anchoring ground. The entrance into this creek or arm of the sea is very safe by keeping it, according to the sea-phrases, open; but when once within it, ships of whatever burden may ride where they please to an anchor; 10 miles E. of Cape Colonna. N. lat. 37° 30'. E. long. 24° 24'.

ZIA, *Ziba*, or *Siba*, in *Ancient Geography*, a city beyond Jordan; 5 miles W. from Philadelphia.

ZIATEK, in *Geography*. See **SAATZ**.

ZIB: See **ZEB**.

ZIBA, a town of Arabia, in the province of Hedsjas; 20 miles S.S.W. of Madian.

ZIBATSKOI, a fort of Russia, in the government of Kolivan, on the Irutch. N. lat. 54° 44'. E. long. 92° 20'.

ZIBELLINA. See *MUSTELA Zibellina*, and *SABLE*.
 ZIBER, in *Geography*, a town of European Turkey, in Bulgaria, on the Danube; 24 miles S.S.E. of Viddin.

ZIBET, or ZIBETH. See *ZEBID*.

ZIBETHA, in *Zoology*. See *VIVERRA Zibetha*.

ZIBETHUM, or ZIBETA, in *Natural History*, civet, a perfume contained in a bladder, in the groin of a civet-cat. See *ZIVET*.

ZIBILÆ, a name given by some authors to a large fort of raifins, refembling the ftones of dates in fhape; they have much pulp, but very little moiiture.

ZIBREIRA, in *Geography*, a town of Portugal, in the province of Beira; 30 miles S. of Alfayates.

ZIBRITZ, a river of European Turkey, which runs into the Danube, near Ziber, in Bulgaria.

ZIBU. See *SIBU*.

ZICCARA, a name of an Indian fruit, refembling a pine-cone, and containing twenty, thirty, or more kernels, of no known ufe in medicine.

ZICHIANI, in *Geography*, one of the tribes of mount Caucasus, collaterally related to the Tcherkeffians or Circaffians. The Zichians or Tichekians, called by the Rufians Yafi, are the principal inhabitants of the ifle of Taman. They formerly paid a fmall tribute to the Krieman khan; in all other refpects they are governed by their own beys. The ifle Atfchuk or Atfchuyef is likewife inhabited by Zichians. The Auchaffians and Zichians are two tribes, which, properly fpeaking, are only one collateral branch of the Tcherkeffians, have belonged to the Rufian empire, as inhabitants of the Kuban, fince the year 1783. See *CIRCAFFIA*.

ZICKAR, a mountain of Algiers, anciently called "Garaphi;" 18 miles S. of Shershell.

ZIDDIM, or ASSEDIM, in *Ancient Geography*, a city of Napphtali. *Jofh. xix. 35*.

ZIDRACH, in *Natural History*, the name given by Cuba, and fome other authors, to that fpecies of the fyn-nathus of Ardedi, commonly called the hippocampus.

ZIECKRA, in *Geography*, a town of Saxony, in the circle of Neufftadt; 4 miles S. of Auma.

ZIEGELBACH, a river of Germany, which runs into the Rhine, near Gernfheim.

ZIEGENBALG, BARTHOLOMEW, in *Biography*, a Lutheran German divine, was born in 1683 at Pulnitz, in Upper Lufatia, and finifhed his education in the univerfity of Halle. In 1705 he was ordained at Copenhagen, with a view of being fent as a miffionary by Frederick IV. king of Denmark to India. In 1706 he arrived at Tranquebar, but he was there oppofed and imprifoned, fo that he refolved, upon his releafe, to return to Europe. In 1715 he landed at Bergen in Norway, and after having vifited Copenhagen, in order to give an account of his miffion, and to receive further inftructions, he travelled through Germany and Holland into England, and from thence to India in March 1716. On his return to Tranquebar, he eftablifhed a Portuguefe and Malabar printing-houfe, in which many of his own works were printed. In the faithful and laborious difcharge of his miffionary duty he employed 13 years, at the clofe of which period his life terminated by a diforder probably owing to his intente application. This event happened in February 1719, in the 36th year of his age. His works were numerous, and of thefe the principal are mentioned in the *Gen. Biog.*

ZIEGENFELD, in *Geography*, a town of Bavaria, in the bifhopric of Bamberg; 12 miles N.E. of Bamberg.

ZIEGENHALS, a town of Silefia, in the principality

of Neiffe: this place is famous for its manufactures of beautiful glaffes. Here are fome iron-works; 10 miles S. of Neiffe. N. lat. 50° 12'. E. long. 17° 17'.

ZIEGENHAYN, a town of Germany, and chief place of a county of the fame name, in the principality of Heffe. It is fituated in a morafs, and can be occasionally inundated. In this place were kept the archives of the fovereign families of Heffe. The counts of Ziegenhayn are foreign; 15 miles S. of Fritzlar. N. lat. 50° 50'. E. long. 9° 15'.

ZIEGENRUCK, a town of Saxony, in the circle of Neufftadt, on the Saal; 10 miles S. of Neufftadt. N. lat. 50° 32'. E. long. 11° 42'.

ZIEGLER, JAMES, in *Biography*, a learned writer of the 16th century, was born at Landhut in Bavaria, and having ftudied in the univerfity of Ingolftadt, finifhed his education by vifiting the libraries of foreign countries, and cultivating the fociety of learned men. He refided feveral years at Rome, collecting in the hiftory of Leo X. and Clement VII. every anecdote that tended to the difcredit of the papal court; and in his conferences with learned Swedes, materials for a correct hiftory of Scandinavia, and of the cruelties committed by Chriftian II. of Denmark. It appears that, befides fome other pofts which he occupied, he was for fome time profeffor at Ingolftadt, and, as fome fay, of mathematics at Upfal. He was for a confiderable time a teacher at Vienna, from whence, for fear of the Turks, he retired to Wolfgang, bifhop of Paffau in Bavaria, under whofe protection he compofed fome of his works; and he died at Paffau in 1549. The earlieft of his publications, whilft he was a Catholic, was written againft the Waldenfes, and printed at Leipfic in 1512. His other works are multifarious, confifting of geographical, hiftorical, political, mathematical, and controverfial tracts, abounding with literary refearches. Although he did not openly renounce the Roman Catholic religion, he favoured the caufe of Luther and the reformers. *Thuan. Hift. Moreri. Gen. Biog.*

ZIELËNZIG, in *Geography*, a town of the New Mark of Brandenburg. This town belonged in a confiderable degree to the knights of Malta; 18 miles S.E. of Cuftirn. N. lat. 52° 30'. E. long. 15° 16'.

ZIENWALD, a town of Saxony, in the margravate of Meiffen; 4 miles S.S.W. of Lauenftein.

ZIERCKOWITZ, a town of the duchy of Stiria; 4 miles E.S.E. of Windifch Feitritz.

ZIERENBERG, a town of the principality of Heffe Caffel; 11 miles N.W. of Caffel. N. lat. 51° 22'. E. long. 9° 20'.

ZIERIA, in *Botany*, was fo named by the writer of the prefent article, in memory of the late Mr. John Zier, F.L.S., who, as Dr. Sims records in the Botanical Magazine, "having been appointed to a profefforship in a Polish univerfity, was preparing to leave this country, but was prevented by a chronic difeafe, which terminated in death." That Mr. Zier was "a learned and induftrious botanift," we are moft ready to confirm by our own teftimony. He was no lefs meritorious in his private character, and bore with modefty and patience thofe privations, which too often belong to literary merit in a foreign country, efpecially when canting and time-ferving are out of the queftion. We have been informed that Mr. Zier was the coadjutor of Mr. WILLIAM CURTIS (fee that article), in part, at leaft, of the celebrated *Flora Londinensis*; taking upon himfelf the technical Latin defcriptions, while Mr. Curtis was engaged in thofe practical obfervations, experiments, and fcientific diftinctions, which make the peculiar merit of the work.

work. Mr Zier died about the year 1796, perhaps rather earlier, at no advanced period of life.—Sm. Transf. of Linn. Soc. v. 4. 216. Jackson in Andr. Repof. v. 9. 606. Sims in Curt. Mag. 1395. Poirat in Lamarek Dict. v. 8. 859.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Rutaceæ*, Juff.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in four deep, ovate, rather acute, equal, permanent segments. *Cor.* Petals four, ovate, pointed, somewhat coriaceous, downy, equal, longer than the calyx, alternate with its segments. *Stam.* Filaments four, alternate with the petals, awl-shaped, simple, smooth, inflexed, much shorter than the corolla, each inserted into a globular gland, projecting above their base at the infide; anthers terminal, roundish, with a minute point. *Pist.* Germen superior, roundish, four-lobed; style terminal, erect, columnar, the length of the filaments, deciduous; stigma capitate, four-lobed. *Peric.* Capsules four, connected at their inner edge, each compressed, abrupt, of two valves and one cell. *Seeds* solitary, oval, compressed, each enclosed in a horny elastic tunic of two valves.

Effl. Ch. Calyx in four deep segments. Petals four. Stamens smooth, each inserted into a gland. Style simple. Stigma four-lobed. Capsules four, combined. Seeds with an elastic tunic.

We are acquainted with four species of this genus, consisting of shrubs, natives of New South Wales, with opposite, stalked, ternate leaves, and white flowers. It is allied to *Boronia*, (see *RUTACEÆ*), as well as to *Crowea*, *Eriostemon*, *Correa*, *Phebalium*, and *Melicope*, to which we refer the reader. *Zieria* is essentially characterized by the insertion of each of its *stamens* into the outside of one of four large glands, standing on the *receptacle*, at the base of the germen; as well as by the simplicity of those *stamens*, in the other part of their structure. All the species abound with resinous dots on their *leaves*, *stalks*, and *calyx*; lodging an essential oil, whose qualities are more or less acrid and aromatic.

1. *Z. lanceolata*. Lanceolate *Zieria*. Brown MSS. (*Z. Smithii*; Andr. Repof. t. 606. Curt. Mag. t. 1395. Ait. Epit. 376.)—Clusters axillary, repeatedly three-forked. Leaflets lanceolate, flat, acute. Branches and stalks warty.—Sent from Port Jackson, New South Wales, by Dr. John White, in 1795. It is said by Mr. Aiton to have been introduced into the English gardens in 1803, where it proves a tolerably hardy green-house shrub, flowering in the spring and early part of summer, and may be increased from cuttings. The *stem* is bushy, of humble growth, being scarcely three feet high, with round, purplish, leafy branches, rough with glandular warts, and when young, besprinkled with minute, starry, rigid pubescence. *Footstalks* warty, channelled, near an inch long, destitute of *stipulas*, each bearing three lanceolate, flat, entire, smooth, single-ribbed leaflets, contracted at each end, the middle one rather the largest, being two inches, or two and a half, in length. *Panicles* opposite, axillary, often two together, somewhat leafy, repeatedly forked, many-flowered, various in length, spreading, slightly downy; their stalks quadrangular, purplish. *Flowers* white, each about the size of a Privet-blossom, with yellow anthers. *Capsules* brown, dotted with glands. Tunic of the seeds white and shining. We agree with Dr. Sims in preferring an expressive specific appellation to one taken from the name of a botanist, and, therefore, as the genus in question was not established on this species more than the rest, all, except the last, having been equally considered, we are happy to set the example of an alteration, in which we can have no other motive than propriety and common advantage. We had called this

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species *multiflora*; but we consider the synonym in the Botanical Magazine as a publication of the unexceptionable name given by Mr. Brown.

2. *Z. levigata*. Smooth *Zieria*.—Clusters axillary, three-forked, corymbose. Leaflets linear, revolute. Branches and stalks very smooth.—Gathered by Dr. White, near Port Jackson, New South Wales. The branches of this pretty species are quadrangular, and very smooth, like every other part, except the petals. *Leaves* smaller than the foregoing, with somewhat of a glaucous hue. *Footstalks* about half a quarter of an inch long. *Leaflets* scarcely an inch, acute, polished, strongly revolute, dotted with glands, and somewhat tinged with purple. *Flowers* a little larger than the last, and much fewer, the panicles being always solitary, much less compound, and situated chiefly towards the upper part of each branch. The stalks are acutely quadrangular, and very smooth. *Calyx* brown or reddish, taper-pointed, likewise quite smooth. *Petals* downy on both sides, like a piece of woollen cloth.

3. *Z. pauciflora*. Few-flowered *Zieria*.—Stalks axillary, with one or three flowers. Leaflets linear-obovate, somewhat revolute. Branches and stalks hairy. Segments of the calyx lanceolate, taper-pointed.—Sent from Port Jackson, with the former, by Dr. White, in 1795. A small shrub, with slender, round, scarcely quadrangular, branches, which are more or less copiously clothed with erect bristly hairs. *Leaves* about half the size of the last; their leaflets dilated upwards, and obtuse, a little crenate towards the end; copiously dotted, rarely hairy, on the upper side; sometimes very hairy beneath, but occasionally quite smooth even in that part. *Flowers* very small, often quite solitary, on an axillary stalk, with a pair of small acute bractes; sometimes there are three flowers on each stalk. Segments of the calyx broad at the base, but tapering suddenly into a long point. *Petals* minutely dotted with tufts of starry hairs, giving them a warty, or granulated, aspect. *Capsules* tuberculated, sometimes hairy; curiously reticulated at the infide. *Seeds* black, rather opaque, with a shining, white, at length convoluted, tunic, whose edge is minutely fringed. The hairy and nearly smooth varieties of this plant look different at first sight, but we cannot detect a specific distinction.

4. *Z. cythoides*. Downy *Zieria*.—Stalks axillary, three-forked, leafy. Leaflets obovate, entire, downy on both sides. Branches and stalks downy.—Native of New South Wales, from whence we obtained a specimen through the favour of earl St. Vincent in 1805. Whether this be Mr. Brown's *arborescens*, mentioned by Dr. Sims, we have at present no means of knowing, and therefore we are obliged to describe it by a name which appears to us very expressive. Every part is clothed with fine dense soft pubescence, appearing stellated and entangled under a high magnifier. *Branches* round. *Footstalks* half an inch long. *Leaflets* about an inch in length, entire, slightly revolute; their upper side peculiarly soft and velvet-like; the under most hoary. When held against the light, they appear full of pellucid dots. *Calyx* very downy; its segments broad and ovate. *Petals* about twice as long, and of the same shape, downy. We have not seen the ripe fruit.

ZIESAR, or ZIEGESAR, in *Geography*, a town of the Middle Mark of Brandenburg; 18 miles S.W. of Brandenburg.

ZIETZ, a town of the Middle Mark of Brandenburg; 10 miles S.W. of Brandenburg.

ZIEZAR, a town of Spain, in the province of Murcia; 22 miles N.W. of Murcia.

ZIFIUS, in *Ichthyology*, a name given by Albertus to the xiphias, or sword-fish. See XIPHIAS.

ZIGADENUS, in *Botany*, a genus of Michaux, *Boreal-Amer.* v. 1. 213. Pursh 241. The name, formed of $\zeta\gamma\sigma$, a yoke, and $\alpha\delta\eta\sigma$, $\alpha\delta\eta\sigma$, a gland, evidently alluding to the pair of glandular depressions in each petal, ought therefore to have been *Zygadenus*. We do not, however, believe that this genus can be separated from HELONIAS. See that article.

The species are,
H. *glaberrima*. Smooth-leaved Helonias. Ker in Curt. Mag. t. 1680. (*Zigadenus glaberrimus*; Michaux as above; 214. t. 22. Pursh n. 1. Ait. Epit. 376.)—Leaves linear, channelled, recurved. Stalk leafy. Bractees ovate, pointed as well as the petals.—In low meadows of Virginia and Lower Carolina, perennial, flowering in June and July. Pursh. Root bulbous. Leaves a span long, concave, spreading. Stalk two feet high, bearing several, gradually diminishing, leaves, and terminating in a panicle of several greenish-white flowers, the size of *Veratrum album*, each of whose petals is marked, near the base, with a double glandular, apparently nectariferous, depression. Stamens distinct from the petals. Seeds unicated. We know not whether they be so in any other *Helonias*.

H. *elegans*. Elegant Helonias. (*Zigadenus elegans*; Pursh n. 2.)—Leaves linear, flat, erect. Stalk nearly naked. Bractees linear. Petals acute.—On the waters of Cokahlaiskit river, near the Rocky Mountains, found by governor Lewis, flowering in July. Radical leaves erect, linear, very long, smooth, ribbed, flat. Stalk taller than the foliage, about two feet in height, round, simple, bearing one or two short leaves. Cluster many-flowered, occasionally branched at the bottom. Bractees as long as the partial stalks, membranous, ribbed. Flowers whitish, the size of *Melanthium virginicum*. Petals ovate, acute, with something of a claw, marked at the base with two vermilion spots. Filaments shorter than the corolla. Stigmas three, reflexed. Pursh.

ZIGÆ, in *Ancient Geography*, a people of Asiatic Sarmatia, on the bank of the Tanais. Pliny.

ZIGALOVKA, in *Geography*, a town of Russia, in the government of Irkutsk; 16 miles N.W. of Tutura.

ZIGANEAH, a mountain of Algiers; 18 miles S. of Constantina.

ZIGANSK, a town of Russia, in the government of Irkutsk, on the Lena; 1472 miles E. of Tobolsk. N. lat. 67°. E. long. 120° 32'.

ZIGEIRA, or ZIGIRA, in *Ancient Geography*, a town of Africa Propria, between the town of Thabraca and the river Bagradas. Ptolemy.

ZIGER, a word used by some of the old writers to express a very fine kind of cassia, extremely aromatic to the taste, and of a purplish-black colour.

ZIGERE, in *Ancient Geography*, a town of the interior of Thrace, on the borders of Lower Mœsia.

ZIGET, in *Geography*, a town of Hungary, situated between the streams of a small river, which unite below the town, and soon after run into the Drave. It is on every side surrounded by a morass, and defended by moats, walls, and bastions; 44 miles S.E. of Canifcha. N. lat. 46° 8'. E. long. 17° 56'.—Also, a river of Hungary, which runs into the Drave, 12 miles S. of Ziget.

ZIGIRA, in *Ancient Geography*, a town of Asia, in Alysia, towards the N., and at a great distance from the Tigris. Ptol.

ZIGURELLA, in *Ichthyology*, the name by which some have called the julis, a small but very beautiful fish,

common about Genoa, and in some degree approaching to the nature of the turdus or wrasse.

It is a species of the labrus, according to Artedi, and is distinguished by the name of the palmaris labrus, with two large teeth in the upper jaw. See LABRUS.

ZIGZAG TREFOIL, in *Agriculture*, a term sometimes applied by farmers to the perennial red clover, marl grass, or wild red clover. See CLOVER and TRIFOLIUM *Purpureum Perenne*.

ZIKLAG, or SICALAG, in *Ancient Geography*, a city which Achish, king of Gath, gave to David, while he took shelter among the Philistines (1 Sam. xxvii. 6.), and which afterwards always belonged to the kings of Judah. Joshua had allotted it to the tribe of Simeon. (Josh. xix. 5.) Eusebius says, that it lay in the southern part of Canaan.

ZILA, in *Geography*, a river of Moldavia, which runs into the Pruth, 30 miles S.E. of Jassy.

ZILEH, a town of Turkish Armenia; 30 miles S.S.W. of Arzinga.

ZILGAN, a river of Russia, which runs into the Oka, N. lat. 53° 4'. E. long. 101° 14'.

ZILIS, in *Ancient Geography*, a town of Africa, in Mauritania Tingitana, marked in Anton. Itin. 24 miles from Tingis, between Taberna and Ad Mercuri. This was a colony established by Augustus, exempt from the jurisdiction of the kings of Mauritania, and dependent upon Bœtica in Hispania.

ZILKEFEL, in *Geography*, a town of the Arabian Irak; 18 miles S.W. of Helleh.

ZILLEBA, a town of Arabia, in the province of Yemen; 35 miles E. of Loehia.

ZILLER, a river of Tyrol, which runs into the Inn, 2 miles above Rattenburg.

ZILLY. See CILLY.

ZILMISSUS, in *Ancient Geography*, a hill of Thrace, on which was a temple dedicated to the god Sabadeus. Macrobius.

ZILTAN, in *Geography*, a town of Africa, in the desert of Barca; 150 miles W. of Angela.

ZIMARA, in *Ancient Geography*, a town of Asia, in the Greater Armenia, at the foot of mount Capotis, in the place where the Euphrates has its source.

ZIMARA, in *Geography*, a town of Asiatic Turkey, in the government of Sivas; 55 miles E. of Sivas.

ZIMBAOA, or ZIMBAO, a town of Africa, in the kingdom of Sofala, and capital of Mocaranga. S. lat. 16° 40'. E. long. 33° 40'.

ZIMBRA. See ZOWAMORE.

ZIMENT-WATER, or COPPER-WATER, in *Natural History*, the name by which some have called water found in places where there are copper-mines, and lightly impregnated with particles of that metal.

The most famous spring of this kind is about a mile distant from Newfol in Hungary, in the great copper-mine called by the Germans *herr grundt*.

The water in this mine is found at different depths, and is received into basons, for the purpose of separating the copper from it; in some of these it is much more saturated with this metal than in others, and will make the supposed change of iron into that metal much sooner. The most common species of iron used in the experiments are, horse-shoes, nails, and the like; and they are found very little altered in shape, after the operation, except that their surfaces are more raised.

The water appears greenish in the bason where it stands; but if a glass of it be taken up, it looks clear as crystal; it has no smell, but a strong vitriolic astringent taste, inasmuch

that the lips and tongue are blistered and scorched upon tasting it.

The miners are well acquainted with the virtue of this water in changing the metals; but they also use it as a medicine: whatever sickness they are seized with, they first attempt its cure by a large dose of this water, which usually both vomits and purges them very briskly.

They also use it in disorders of the eyes, in some of which it must be of great power; but in others, it is very improper; so that upon the whole they do more harm than good with it.

The copper produced from these waters is valued by the people much beyond any other copper, as being much more ductile, and running easier in the fire: the people in the neighbourhood have many vessels of it; but it is to be observed, that its ductility and hardness increase after it is taken out of the water; for while immerged in it, it is friable.

It is observed, that after great rains the springs are always fuller than at other times, and the virtues of the water considerably less.

A pound of this water, when strongest, evaporated over a gentle fire, becomes first turbid, and afterwards deposits a yellowish sediment, which evaporated to dryness, weighs two scruples and a half; and when warm water is poured upon this and filtered, six grains of yellowish earth will be left in the filtre; and the greenish solution being again evaporated to a pellicle, and the operation being several times repeated, somewhat more than two scruples of a blueish-green vitriol will be separated in small crystals.

A small quantity of oil of tartar being added to a pound of this water, the whole becomes turbid, and on filtration leaves a large residuum in the filtre, which dried, weighs about two scruples and a half, and is found to be cupreous vitriol, with a small mixture of a neutral salt. If a pint of this water be put into a bottle, and a small piece of iron thrown into it, bubbles will appear on the iron, which will gradually be changed to a copper colour. On the second day, the water will be turbid, and afterwards whitish, and white filaments will gather about the bottom and sides of the glass, and about the iron, which will appear throughout of a coppery colour. From these experiments, we may easily understand what the true nature of the water is; that it contains a large quantity of vitriol of copper, which it probably owes to a solution of that metal, by means of the acid of the common pyrites and water: when this is known, the effects are not difficultly accounted for, there being no real change of one metal into another; but the true state of the case being, that the particles of one metal are dissolved and carried away, and those of another metal deposited in their place. A water thus impregnated is a menstruum capable of dissolving iron, and in the solution of that metal becomes so weakened as to let go the copper it before contained in small parcels. This is seen to be the case, by examining the changed metal while it lies in the water, the copper then appearing not a soft malleable and even mass, but a congeries of granules closely placed together, and resembling the small granules, or ova, in the spawn of fishes; and it is very friable and fragile while in this state.

This solution of one metal, and deposition of the particles of another in its place, is a thing very familiar in chemistry, and is seen every day in numerous instances; but in none so familiar as in a like case, or solution of iron and copper in the same menstruum. Thus, if a piece of copper be dissolved in aqua fortis, and when this solution is perfected a piece of iron be thrown into the liquor, the same thing will be seen that is in this spring, for the iron will be dissolved,

and the copper which was before dissolved in the menstruum will be slowly precipitated and deposited in the place of it. Phil. Trans. N^o 479, p. 355, &c. See on this subject the articles COPPER and VITRIOL.

ZIMEX, a word used by some of the old chemical writers for verdigrise.

ZIMITI, in *Geography*, a town of South America, in the province of Carthagena, near a lake; 60 miles S. of Santa Fé de Bogota. N. lat. 7° 42'. W. long. 74° 6'.

ZIMMER, an island of the Red sea, much smaller than *Foofst*, (which see,) without inhabitants, and without water; though, by the cisterns that now remain, and are sixty yards square, hewn out of the solid rock, there is reason to imagine that this was once a place of consequence: rain, at certain seasons, falls here in abundance. It is covered with young plants of rack-tree, whose property it is to vegetate in salt water. It has also a considerable number of Saïel, or Acacia-trees. In this island there are antelopes and hyænas; and hence we may infer that water, without which these animals could not subsist, is found in some subterranean caves or clefts of the rocks, unknown to the Arabs or fishermen. Mr. Bruce found here plenty of the large shell-fish called Biffer and Surrumbac, but no other. *Foofht* bears from this island 8 miles N.W. by N. $\frac{1}{2}$ W. N. lat. 16° 7'.

ZIMMER, in *Commerce*, a term used for reckoning in Germany, and denoting 40 pieces.

ZIMMERBACH, in *Geography*, a town of France, in the department of the Upper Rhine; 5 miles W. of Colmar.

ZIMMERMAN, JOHN GEORGE, in *Biography*, an eminent physician and miscellaneous writer, was born in 1728 at Brug, in the canton of Bern. Having completed his preparatory education at Bern, and chosen the medical profession, he placed himself in the university of Göttingen, under the tuition of the celebrated Haller; and on graduating in 1751, the subject of his thesis was the doctrine of irritability. His respect for Haller was testified in the account he gave of him in the journal of Neuchâtel, printed in 1752. Having married at Bern a relation of Haller, he settled as a physician in his native town. The retirement of his situation afforded him an opportunity of composing many pieces in prose and verse; and in 1756 he published the first sketch of his popular work "On Solitude." This publication was followed by an essay "On National Pride," in 1758; by his work "On the Experience of Medicine," in 1763, and several others; and by "A Treatise on Dyfentery," in 1766. In 1768 he accepted an invitation to occupy the vacant post of physician to the king of England for Hanover, whither he removed. In this situation, the accumulation of business furnished in some measure an antidote to that constitutional irritability of temper, and tendency to hypochondriacal complaints, which in the retirement of a small town had rendered him unhappy; and having occasion to place himself under the medical care of a surgeon at Berlin, on account of a local disease under which he laboured, his removal thither in 1771, and the notice that was taken of him by several persons of distinction, and even by the king, were favourable both to his health and spirits, and of course to his happiness. Having lost his first wife, he formed a second matrimonial connection in 1782; and to this union he was indebted for many of those comforts which counterbalanced and alleviated his afflictions. His remaining years were chiefly devoted to the completion of his work "On Solitude," which was published in four volumes. In the year 1786, Zimmerman was sent for to attend the great Frederick in his last illness; and

this visit gave him an opportunity of publishing an account of his "Conversations" with that celebrated prince. He was induced also, by the notice that was taken of him, to undertake a defence of the character of Frederick against the censures of count de Mirabeau. The severe criticisms to which these writings exposed him, and the part he took in the controversies that agitated the continent with regard to the principles that produced the French revolution, irritated his feelings and disquieted a mind like his peculiarly susceptible of contumely and reproach. His political and religious principles led him to view with jealousy and detestation those societies which, in his judgment, and in that of others of similar sentiments, aimed at the subversion of established forms and authorities, and to declare war against them. Such were his abhorrence and dread of them, that he addressed a memoir to the emperor Leopold, recommending the suppression of them by force; and he subjected himself to a prosecution for a libel by a charge brought against a person by name for an unavowed publication. His mind had arrived to such a state of irritation, that the approach of the French towards Hanover in 1794 almost subverted his reason. Dreading the consequences of their arrival, he abstained from food, wasted to a skeleton, and died absolutely worn out in 1795, at the age of 66. "Such," says his biographer, "was the melancholy end of a man whose moral and intellectual qualities rendered him in a high degree the object of private friendship and public esteem." Tillot's Life of Zimmerman. Gen. Biog.

ZIMOVE, in *Geography*, a village of Russia, in the government of Irkutsk, where is a custom-house; 52 miles S.E. of Barguzinsk.

ZIMOVE *Tchijkoi*, a town of Russia, in the government of Irkutsk; 16 miles S.W. of Vitimkoi.

ZIMOVE *Yafschnoe*, a winter habitation of Russia, on the N. coast of Baikal lake, in the government of Irkutsk. The word *Zimove*, in Russian, means a house or inn, built at a distance from a town, for the accommodation of travellers, where are generally found a warm room, fresh bread, and a kind of liquor called *quasi*. N. lat. 55° 20'. E. long. 109° 14'.

ZIMOVE *Zaminkoi*, a town of Russia, in the government of Irkutsk, near lake Baikal; 76 miles S.E. of Vercholenk.

ZIMOVSKAIA, a town of Russia, in the country of the Cossacks, on the Choper; 48 miles W. of Arkadinkaia.

ZIN, SIN, or *Senna*, in *Ancient Geography*, a city S. of the land of promise. (Numb. xxxiv. 4.) See SIN.

ZINARI, in *Geography*, an island in the Grecian Archipelago. N. lat. 36° 59'. E. long. 26° 10'.

ZINARIA, a word used by the Arabians for a kind of vitiated bile, called aruginous bile.

ZINC, in *Chemistry*, the name of a metal, in Latin *zincum*. The ancients do not appear to have been acquainted with this metal. *Cadmia* was the name by which they seem to have known one of its ores, which was so called from Cadmus, who, it is said, taught the Greeks how to form brass by its means. It is first mentioned by Albertus Magnus, but it is doubtful if he had ever seen it. The word *zinc* first occurs in the writings of Paracelsus. This metal has been also called *spelter*.

Zinc has never been found in Europe in a state of purity, and chemists were late in discovering a method of extracting it from its ores. Henkel seems to have been one of the first who effected this about the year 1720, and he was soon followed by others. Zinc is of a brilliant white colour, with a shade of blue, and seems to be composed of a number of

thin plates adhering together. It imparts a perceptible smell and colour to the skin when rubbed by it for some time; hence it is rather soft. Its specific gravity is said to vary from 6.86 to 7.1, the lightest being esteemed the purest. When hammered, its specific gravity becomes as high as 7.19.

This metal is by no means so malleable as copper, lead, or tin; it is not however brittle. It yields, and becomes somewhat flatter, when struck with a hammer. When heated a little above 212°, it has the remarkable property of becoming very malleable, and in this state may be reduced into very thin plates, either by hammering or rolling. When heated to about 400°, it becomes so brittle that it may be reduced to powder in a mortar.

Zinc may be drawn into wire. According to Mufchenbroeck its tenacity is such, that a wire of $\frac{1}{16}$ th of an inch in diameter is capable of supporting a weight of about 26 lbs.

Zinc melts at a temperature of about 680°, according to Dr. Black. If the heat be increased it evaporates, and may be easily distilled over in close vessels: upon this property of zinc, Von Swab's method of extracting it from its ore was founded. When allowed to cool slowly, this metal crystallizes beautifully in small bundles of quadrangular prisms disposed in all directions, which, if exposed to the air while hot, assumes a blue changeable colour.

When exposed to the air, zinc soon tarnishes, but it scarcely undergoes any other change. When kept under water, its surface becomes black, the water is decomposed, hydrogen is emitted, and the oxygen combines with the metal. If heat be applied, these changes go on more rapidly; and if the steam of water be made to pass over zinc at a high temperature, it is very rapidly decomposed.

When this metal is kept melted in open vessels, it soon becomes covered with a grey pellicle of oxyd. If the heat be very strong it takes fire, and burns with a brilliant white flame, and at the same time emits a great quantity of very light white flakes. This is merely the oxyd of zinc. It was well known to the ancients, and received from them many whimsical names, such as *pompholyx*, &c. Among the alchymists it was known by the names of *nihil album*, *lana philosophica*, *flowers of zinc*, &c.

Zinc appears to combine with only one proportion of oxygen, which has been stated by different chemists to vary from 24.16 to 25 of oxygen to 100 of the metal. According to the first of these determinations, the weight of the atom of zinc will be 41.39; according to the second 40. Dr. Thomson has decided upon 41.25 as the most probable weight of the atom.

Zinc combines readily with chlorine, and forms a chloride of zinc. It may be prepared by dissolving zinc in muriatic acid, or by exposing the metal to the gas, when the two combine by a species of combustion. The chloride may be also obtained by distilling zinc-filings with the oxy-muriate of mercury, or *corrosive sublimate*; and thus obtained, it was formerly denominated the *butter of zinc*. When thus prepared, it sublimes on the application of heat, and crystallizes in needles; but according to Dr. Davy, when the common muriate is heated in a glass tube, it does not sublime even at a red heat, but remains in a state of fusion. Exposed to the air, it soon deliquesces. According to Dr. J. Davy's analysis, it is composed of

Chlorine	-	-	-	100
Zinc	-	-	-	100

But if we suppose it to be composed of an atom of zinc and

ZINC.

and an atom of chlorine, and the atom of zinc to weigh as above, its constituents should be

Chlorine	-	-	-	100
Zinc	-	-	-	91.6

Zinc readily combines with iodine by heat. The compound, or *iodide*, is white. It is volatile, and crystallizes in fine quadrangular prisms. It deliquesces in the air, and is very soluble in water. The solution is colourless, and does not crystallize. Gay Lussac has shewn, that this compound consists of one atom iodine, and one atom zinc, or by weight of

Iodine	-	-	-	100
Zinc	-	-	-	26.52

No compound of zinc with fluorine is at present known. Zinc does not combine with azote nor hydrogen; nor are we acquainted with any compound of this metal with boron and silicon.

Zinc may be combined with phosphorus by dropping small bits of phosphorus into it while in a state of fusion. Phosphuret of zinc is of a white colour, and possesses a metallic lustre, which more resembles lead than zinc. It is somewhat malleable. It emits the odour of phosphorus when filed or hammered, and if exposed to a strong heat it burns like zinc. Phosphorus also appears to combine with the oxyd of zinc, and to form a peculiar compound.

Sulphur cannot be combined artificially with zinc; but if melted with the oxyd of zinc a peculiar compound is formed. A similar compound is formed when sulphuretted hydrogen in combination with an alkali is dropped into a solution of zinc. It is at first white, but becomes darker on drying. Dr. Thomson considers this compound as a sulphuret of zinc. Mr. E. Davy ascertained, that when the vapour of sulphur is passed over zinc in fusion a yellowish compound is obtained, similar in appearance to blende.

One of the most common ores of zinc is *blende*, described below, and which is a sulphuret of zinc, compounded, according to Dr. Thomson's experiments, of

Zinc	-	-	-	100
Sulphur	-	-	-	48.84

Hence he considers it as a compound of one atom zinc, and one atom sulphur.

The alloys of zinc and the metals of the fixed alkalies are speedily decomposed by exposure to the air or immersion in water. We are not acquainted with the alloys of zinc and the metallic bases of the alkaline earths.

Zinc may be combined with arsenic by distilling a mixture of it and arsenious acid. With iron, zinc combines with difficulty; the alloy when formed, according to Lewis, is hard, somewhat malleable, and of a white colour, like silver. Malouin has shewn, that zinc may be used instead of tin for covering iron plates; a circumstance which demonstrates an affinity between the two metals.

Zinc does not appear capable of combining with nickel or cobalt by fusion. The alloys of zinc with manganese, cerium, and uranium, are unknown.

For the other alloys of zinc, see the different metals; particularly for the most important of them or brass, see BRASS and COPPER.

Salts of Zinc.—Almost all the acids act with energy on zinc, in consequence of its powerful affinity for oxygen. The salts of zinc, therefore, are very easily formed, and on account of their being but one oxyd of zinc are not much liable to variation.

Nitrate of Zinc.—The nitric acid attacks zinc with such energy, that it is commonly necessary to moderate its action by diluting it with water. Even then much heat is evolved, and a strong effervescence is produced by the escape of nitrous oxyd gas. The solution is transparent and colourless, very caustic, and yields by evaporation flat, friated, tetrahedral prisms, terminated by four-sided pyramids. These crystals attract moisture on exposure to the air, and are soluble in water and alcohol. When heated they melt, and if thrown on burning coals, detonate with a red flame.

Carbonate of Zinc.—*Calamine*, one of the ores of zinc, is a native carbonate of zinc, as described below. This salt usually exists in the form of a white powder, and may be obtained by precipitating zinc from its solution in acids by an alkaline carbonate.

Phosphate of Zinc.—The phosphoric acid unites in two proportions with the oxyd of zinc. The neutral phosphate is a tasteless white powder insoluble in water. The bi-phosphate is soluble in water, if not exposed to too great a heat. It does not crystallize, and is strongly acid.

Sulphate of Zinc.—Concentrated sulphuric acid scarcely acts upon zinc without the assistance of heat; but when diluted it acts upon the metal very strongly, and hydrogen gas is given out in abundance. In this case, the water is decomposed, its oxygen combines with the metal, while its hydrogen escapes. The solution, when concentrated, yields crystals in abundance.

This salt, formerly known under the name of *white vitriol*, was discovered in Germany, about the middle of the 16th century. When quite pure, it is perfectly white. The form of its crystals is that of flat quadrangular prisms, terminated by four-sided pyramids. At a temperature of 60°, it dissolves in about 1.4 times its weight of water. In boiling water, it dissolves in any quantity whatever. The constituents of this salt are,

1 Atom of sulphuric acid	-	-	-	31.74
1 Atom of zinc	-	-	-	32.54
5 Atoms of water	-	-	-	35.72
				100.00

When heated, the crystals part with their water, and if the heat be strong, the whole of the acid likewise separates, and leaves the oxyd of zinc in a state of purity. See VITRIOL, *White*.

Muriate of Zinc.—See *Chloride of Zinc, supra*.

Sulphite of Zinc.—This salt exists in the form of crystals, soluble in water, but insoluble in alcohol. On exposure to the air, they are soon converted into the sulphate of zinc. Fourcroy and Vauquelin describe a *hypo-sulphite* of zinc, which assumes the form of four-sided prisms, terminated by four-sided pyramids. They are soluble in water and alcohol.

Borate of Zinc is a white insoluble powder. It may be formed by pouring borate of soda into the nitrate or muriate of zinc.

Arseniate of Zinc is a white insoluble powder, and may be formed by mixing solutions of the alkaline arseniates with the sulphate of zinc.

Acetate of Zinc.—This salt exists in the form of rhomboidal or hexagonal plates of a talky appearance, and is not very soluble in water. Solutions of this salt form an excellent external application to inflammations.

Oxalate of Zinc.—This salt is a white powder, little soluble

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n water, and may be formed readily by double decomposition.

Tartrate and Citrate of Zinc.—Both these salts exist usually in the form of powders, and are but little soluble in water. They may be procured, like the oxalate, by double decomposition.

The other salts of zinc are of very little importance or interest, and do not therefore merit to be enumerated here. The salts of zinc may be distinguished in general by their forming colourless solutions in water, by their yielding white precipitates with prussiate of potash, sulphuretted hydrogen, and the alkalis, and by the characteristic circumstance that zinc is not precipitated in the metallic state by any other metal.

Uses of Zinc and its Compounds.—Neither this metal nor its compounds, if we except *brass*, are much employed in the arts nor in medicine. A chief use of zinc is in the formation of galvanic apparatus, and in electrical experiments. (See GALVANISM and ELECTRICITY.) As it is not a poisonous metal, it has been recommended instead of tin and lead for domestic purposes; but the ease with which it is oxidized makes it very unfit for all sorts of culinary apparatus.

The strong affinity of zinc for oxygen renders it of great use as a chemical agent for precipitating other metals from a state of solution in the metallic state. The oxide of zinc is used in medicine, both internally as a tonic, and externally mixed with hog's-lard as an ointment. The native carbonate is also used in the same manner as an external application. See UNGUENTUM *Calamine*, and UNGUENTUM *Zinci*.

The *sulphate* and the *acetate* are the only salts of zinc used in medicine; for the properties of which, see above.

ZINC, Ores of, in Mineralogy. The ores of zinc are generally associated with lead-ores, and exist abundantly in various parts of England; particularly in veins in the mountain lime-stone of Derbyshire, Durham, Cumberland, Yorkshire, Somersetshire, and North Wales. The ores of zinc are either oxides, carbonates, or sulphurets of zinc, and are principally known as calamine or blende. There is an ore of zinc hitherto found only in North America, called by Dr. Bruce red zinc-ore; it occurs in several of the iron-mines in Suffex county, New Jersey.

Red Zinc Ore is of a blood-red or aurora-red colour; it occurs massive and disseminated. The fresh fracture is shining, but becomes dull after long exposure to the air, and is covered with a pearly crust; the principal fracture presents a foliated structure; the cross fracture is conchoidal. It is opaque or translucent on the edges; it yields a brownish-yellow or orange streak; it is brittle. The specific gravity is 6.22. It is infusible without addition by the blow-pipe, but melts into a transparent yellow bead with borax. When pounded and mixed with potash, and exposed to heat, it melts into an emerald-green mass, which, on solution in water, yields the same colour; but on the addition of the mineral acids is immediately changed to rose-red. This ore is soluble in the mineral acids. Its constituent parts are,

Zinc	76
Oxygen	16
Oxyds of manganese and iron	8
	100

Bruce's American Mineralogical Journal, p. 69.

According to Dr. Bruce, this ore possesses advantages in the manufacture of brass over those generally used; for without any previous preparation, it affords with copper

brass of the very finest quality, possessing a high degree of malleability, and suited for the most delicate workmanship. Red zinc-ore is characterized and distinguished from red silver-ore and red lead-ore by its infusibility; the latter melting into a blackish slag before the blow-pipe. Red orpiment, with which it might be confounded, is distinguished from red zinc-ore by its volatility, and the garlic smell which it yields. This ore of zinc has greater specific gravity than red copper-ore, and its solution in acids is colourless; but those of red copper are green. Calamine is divided by some mineralogists into four kinds, sparry calamine, compact calamine, earthy calamine, and electric calamine.

Sparry Calamine: Zinc Carbonatè, Häüy.—Its colours are greyish and yellowish-white, and sometimes green and reddish-brown. It occurs massive, botryoidal, cellular, stalactitic, and crystallized, in acute and obtuse rhomboids, and in longish quadrilateral tables: the crystals are small. The lustre of sparry calamine is between resinous and vitreous. The structure is imperfectly lamellar, and sometimes radiated. It is translucent, or more or less transparent; it yields easily to the knife. The specific gravity is 4.3. It is infusible before the blow-pipe, and loses about 34 per cent. by ignition. With muriatic acid it effervesces, and is dissolved. According to Smithson, the constituent parts of this ore from Derbyshire are,

Oxyd of zinc	65.2
Carbonic acid	34.8
	100.

From Somersetshire,

Oxyd of zinc	64.8
Carbonic acid	35.2
	100.

Compact Calamine: Zinc Carbonatè, Häüy.—Its colours are, greyish, greenish, or yellowish, and often brown, from an intermixture with iron. It occurs massive, botryoidal, disseminated, stalactitic, reniform, and mamillated; it has a dull, feebly glittering, resinous lustre. The fracture is uneven and coarse-grained, or splintery, and sometimes even a flatty conchoidal. It sometimes occurs in concentric lamellar concretions; it is opaque. Its chemical characters and constituent parts are the same as of the sparry calamine, these minerals being only varieties differing in form from each other.

Earthy Calamine: Zinc Carbonatè, Häüy.—It is of a greyish or yellowish-white colour, sometimes snow-white; externally it is frequently covered with a tint of yellowish-brown. It occurs massive, and coating other minerals; it is opaque, and has an earthy fracture; it yields to the nail, and adheres to the tongue. The specific gravity is 3.358.

According to Smithson, the constituent parts are,

Oxyd of zinc	71.4
Carbonic acid	13.5
Water	15.1
	100.

Electric Calamine: Zinc Oxydè, Häüy.—Its prevailing colours are, greyish, blueish, or yellowish-white; externally it is sometimes brownish or blackish. It occurs crystallized, mamillated, botryoidal, stalactitic, and massive. The crystals are six-sided prisms, with dihedral summits, or acute octahed.

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octahedrons; sometimes truncated on the summits. The crystals are small, and either solitary, or radiating in groups, like zeolite. The lustre is shining, glistening, and vitreous: the structure is imperfectly lamellar, or divergently fibrous. It is sometimes opaque, and sometimes translucent or transparent: it yields to the knife, but is much harder than common calamine. The specific gravity is 3.4. When gently heated it is strongly electric; it is infusible, and loses about 12 per cent. by ignition. It is soluble in muriatic acid with effervescence: the solution gelatinizes on cooling. According to Klaproth, its constituent parts are,

Oxyd of zinc - - -	66
Silicx - - - - -	33
	99
	—

According to Smithson,

Oxyd of zinc - - -	68.3
Silicx - - - - -	25.
Water - - - - -	4.4
	—
	97.7

Calamine sometimes occurs in what are called supposititious crystals, as if it had been moulded over crystals of other minerals, and the internal crystal had disappeared. In Derbyshire, the working miners are of opinion, that the calamine destroys the lead-ores when they occur together; or, as they express it, the calamine eats up the lead. That some process of decomposition or change takes place where these ores are associated there can be no doubt; but by what means this is effected we are at present ignorant. See VEINS, *Metallic*.

Calamine, commonly called lapis calaminaris, when cleaned and roasted, is used for the fabrication of brass, forming a compound with copper. (See BRASS.) Its uses in the making of brass is of very high antiquity, being mentioned by Aristotle.

Calamine is also the most valuable ore from which metallic zinc is extracted.

The uses of calamine were not known in England before the reign of queen Elizabeth, and even so late as the year 1700 it was commonly carried out of the kingdom as ballast by the ships which traded to Holland. The calamine raised in Derbyshire about the year 1780 amounted to 1500 tons. Sixty years before that time the quantity got did not exceed 40 tons, the greater part being thrown away through ignorance of its nature and value.

The dressing of calamine consists principally in picking out all the pieces of lead-ore, lime-stone, iron-stone, heavy spar, and other minerals mixed with it in the mine. The picked calamine is then calcined in proper furnaces, and loses by calcination between a third and fourth part of its weight, which is the carbonic acid. In great works, where calamine is prepared for the brass-makers, after its calcination, it is carefully picked again, the accidental ingredients being rendered more discernible by the action of fire. It is afterwards ground to a fine powder, and washed in a gentle rill of water, to free it from earthy particles with which it may be intermixed; for these being lighter are carried off by the water: it is then made up for sale.

A ton of the crude Derbyshire calamine, as dug from the mine, is reduced, by the various processes it undergoes before it becomes fit for use, to about twelve hundred weight. Part of the zinc is lost in calcination, particularly if too strong a fire be made: this is evident by the flame visible over the furnace. It would be practicable to use calamine without calcining it, for the carbonic acid would be expelled

by the heat applied in making brass; but then there would be seven or eight hundred weight put into the brass pots which would be of no use in the operation: it is therefore better to get rid of so large a quantity of unserviceable matter, and thereby avoid also an increased expence of carriage from the calamine-furnace to the places where the brass is made. Watson's Chemical Essays, vol. iv.

Blende comprises various sulphurets of zinc, differing in the proportion of their constituent parts, and the admixture of other mineral substances.

Yellow Blende, or Phosphorescent Blende: Zinc Sulphuræ Jaune, Brongniart.—The prevailing colours of this ore are yellow, passing into green, and sometimes hyacinth-red, aurora-red, or brownish-red. It occurs massive, disseminated, and crystallized. The crystals are generally small, middle-sized, and so closely aggregated, that it is difficult to determine the precise figure, which appears either the rhomboidal, the dodecahedron, the octahedron, or the tetrahedron. Yellow blende is translucent, passing into transparent, and has a splendid adamantine lustre. It yields to the knife, and affords a yellowish-grey or yellowish-white streak: it is brittle. The specific gravity rather exceeds 4: according to Karf-ton, it is 4.1.

It decrepitates before the blow-pipe, and becomes grey; but is infusible either alone or with borax. By friction it becomes phosphorescent, and, according to Bergman, acts as powerful in this respect in water as in air.

Foliated Brown Blende: Zinc Sulphuræ Brun, Brongniart.—It is of a reddish or yellowish-brown, passing into blackish-brown and dark red. It occurs massive, disseminated, and crystallized. The form of the crystals is a rhomboidal dodecahedron, either perfect or truncated on the alternate lateral angles and edges, or an octahedron, either perfect or truncated. It occurs also in tetrahedrons, perfect or truncated, and in rectangular four-sided prisms, six-sided prisms, and acicular crystals. Sometimes the crystals are joined, forming a twin crystal. The lustre is shining or splendid, and either resinous, adamantine, or semi-metallic; it has a straight lamellar structure, with a cleavage in six directions. It is more or less translucent; it yields to the knife, and affords a yellowish-grey or yellowish-brown streak; it is brittle, and easily frangible. The specific gravity of this ore varies from 3.7 to 4. It is infusible, and yields an hepatic odour when digested in sulphuric acids. The constituent parts of blende are given as under; but some varieties of foreign blende contain silicx, arsenic, and manganese, which may be regarded as accidental.

Blende from Satilberg, according to Bergman:

Zinc - - - - -	44
Iron - - - - -	5
Sulphur - - - - -	17
Silicx - - - - -	24
Alumine - - - - -	5
Water - - - - -	5
	—
	100

From Allonhead, in Northumberland, according to Dr. Thomson:

Zinc - - - - -	58.8
Iron - - - - -	8.4
Sulphur - - - - -	23.5
Silicx - - - - -	7.
	—
	97.7

Fibrous Blende.—The colour is reddish-brown : it occurs reniform and massive. The structure is divergently fibrous in one direction, and concentric lamellar in the other : its lustre is resinous ; it is opaque or faintly translucent at the edges ; it agrees in other characters with foliated blende. The constituent parts are given as under in the Journal des Mines, t. xlix. No. 13.

Zinc	-	-	-	62
Iron	-	-	-	3
Lead	-	-	-	5
Arfenic	-	-	-	1
Sulphur	-	-	-	21
Alumine	-	-	-	2
Water	-	-	-	4
				98
				—

Black Blende: Zinc Sulphuréd Noir, Haüy.—It is of a greyish or velvet-black colour, and sometimes brownish-black. When translucent, it appears blood-red ; it is sometimes tarnished with various colours. It occurs massive, disseminated, and crystallized, in the same forms as brown blende ; internally it is shining, sometimes splendid ; and the lustre is adamantine, inclining to metallic. It has a foliated structure, and six-fold cleavage. The fragments are angular, and rather sharp-edged. It is almost always opaque. The streak is intermediate, between yellowish-grey and lightish-brown : it is easily frangible. The specific gravity varies with the admixture of ingredients in this ore, from 3.9 to 4.1. Auriferous blende from Nagyag, as given by Muller, is 5.39. The constituent parts of black blende are as under :

Zinc	-	45	53
Iron	-	9	12
Lead	-	6	0
Arfenic	-	1	5
Sulphur	-	29	26
Silex	-	4	0
Water	-	6	4
		—	—
		100	100

Blende is distinguished from tin-stone by its inferior hardness ; it yields pretty easily to the knife. It may be distinguished from other ores which resemble it, by the sulphureous odour which it yields when thrown into an acid, or triturated in a mortar. The common name given to this ore by the English miners is Black Jack. It frequently occurs in the upper part of the metallic veins in Cornwall, that are rich in other ores below. Blende is not so valuable an ore of zinc as calamine : it must be freed from its sulphur by calcination before it can be applied to the making of brass. Some blendes lose one-fourth of their weight, others one-sixth by calcination. It has been for many years used for making brass at Bristol as well as calamine ; but so little was this application of it known in other parts of the kingdom, that in the year 1777 we are informed by Dr. Watson, in his Chemical Essays, that its use in Derbyshire was but recently discovered ; and he was requested not to divulge the purpose to which it might be applied, probably to evade the dues on minerals payable to the duchy court of Lancaster.

ZINCHI, or ZICCHI, in *Ancient Geography*, a people of Asiatic Sarmatia, upon the coast of the Euxine sea, and separated from the Sanichæ, by the river Achæus. Arrian.

ZINCKGRABEN, in *Geography*, a town of Bavaria, in the bishopric of Bamberg ; 5 miles E. of Lichtenfels.

ZINDIKITES, a sect among the Mahometans ; so de-

nominated from their leader Zindik, whom Grotius makes to be one of the magi, and a follower of Zoroaster.

The Zindikites believe no providence nor resurrection : they allow no other God but the four elements ; and, in this sense, they assert, that man, being a mixture of those simple bodies, returns to God when he dies.

ZINDINSKAIA, in *Geography*, a fort of Russia, on the confines of China, in the government of Irkutsk ; 80 miles S. of Selenginsk.

ZINETUS, a word used by Paracelsus as a name for one of the brasa-like marcasites.

ZINGANE-IS-KELESI, in *Geography*, a town of European Turkey, in Romania ; 6 miles S. of Burgas.

ZINGAR, a word used by some of the chemical writers for verdigris ; and by others for the flos æris, or flowers of copper or brass.

ZINGHA, in *Geography*, a town of Africa, in Whidah ; 20 miles N.W. of Sabi.

ZINGI, in the *Materia Medica*, the name of a seed, sometimes also called the anisum stellatum, or starry-headed anise.

ZINGIBER, in *Botany*, *Ζιγγίβρις* of Dioscorides, a name which the Greeks seem to have taken, when they obtained the plant itself, from the Arabians. Gærtner, dissatisfied with Linnaeus's application of the ancient name *Amomum*, to a genus of the *Scitamineæ*, under which they both of them confounded very different things, substituted *Zingiber* in its place, as undoubtedly belonging to one or other of the species. But since this tribe, and its generic distinctions, have been cleared up by Mr. Roscoe, it becomes necessary to discriminate between *Amomum* and *Zingiber*, and consequently both names are employed.—Roscoe Tr. of Linn. Soc. v. 8. 347. Dryandr. in Ait. Hort. Kew. v. 1. 5. (*Amomum* ; Lamarck Illustr. t. 2. f. 3.)—Class and order, *Monandria Monogynia*. Nat. Ord. *Scitamineæ*, Linn. Brown. *Cannæ*, Juss.

Gen. Ch. Cal. Perianth superior, of one leaf, tubular, sheathing, membranous, splitting at one side. Cor. of one petal : tube twice the length of the calyx, a little swelling upwards : outer limb ringent ; the upper lip undivided ; lower in two deep, equal, deflexed segments : inner limb a large, spreading, three-lobed lip, of which the middle segment is the largest, all of them more or less wavy and crenate. Stam. Filament one, erect, oblong, extended beyond the anther in an awl-shaped incurved beak, involute at the edges, embracing the style ; anther attached by its back, below the beak of the filament, oblong, of two close, parallel, linear lobes, meeting round the style, bursting in front. Pist. Germen inferior, roundish, small, crowned with a pair of filaments ; style thread-shaped, embraced by the filament, and scarcely extending beyond its beak ; stigma small, concave, fringed, projecting a little beyond the point of the beak. Peric. Capsule?

Ess. Ch. Anther two-lobed. Filament elongated beyond the anther, with an awl-shaped, channelled beak, embracing the style. Outer limb of the corolla ringent ; inner a three-lobed lip.

Obs. Jussieu had already, after Adanson, remarked a difference between the inflorescence of the Ginger and the Cardamom tribes, though both have been comprehended by all botanists under *Amomum*. In the former, the flowers compose a dense spike, supported by a radical stalk ; in the latter, they are panicled at the base of the stem. So important a difference in habit, between plants whose general structure is so uniform and simple, might lead us to look for some generic difference in the parts of fructification. This Mr. Roscoe has detected in the *filament*, according to the

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the principle which runs through all his generic distinctions of this tribe, and which is supported throughout by the inflorescence, as well as the parts of the flower in general. Nothing more perfect has ever been accomplished in systematic botany. See SCITAMINEÆ.

1. *Z. officinale*. Narrow-leaved Ginger. Roscoe n. 1. Ait. n. 1. (*Z. majus*; Rumph. Ambon. v. 5. 156. t. 66. f. 1. Amomum Zingiber; Linn. Sp. Pl. 1. Willd. Sp. Pl. v. 1. 6. Jacq. Hort. Vind. v. 1. 31. t. 75. "Inchi; Rheede Hort. Malab. v. 11. 21. t. 12.")—Bractæas ovate, acute. Segments of the outer limb of the corolla linear, revolute. Middle lobe of the lip entire.—Native of the East Indies; naturalized in Jamaica. A stove plant in England, flowering in September. It appears to have been cultivated here by Edward lord Zouch, before the year 1605. The root is perennial, tuberous, fleshy, with long stout fibres, well known for its hot, gratefully aromatic, flavour, and cordial qualities. The whole herb is smooth, and partakes of the flavour of the root. Barren stems several, erect, herbaceous, wand-like, leafy, about three feet high. Leaves alternate, linear-lanceolate, acute, entire, single-ribbed, spreading, with long, close, sheathing, abrupt foot-stalks. Flower-stalks radical, a foot high, clothed with tubular sheathing bractæas. Spikes solitary, erect, club-shaped, enveloped in broader, shorter, less pointed, crowded bractæas, each accompanied by a solitary, sessile flower, twice its own length, of a delicate texture and short duration. The outer limb of the corolla is of a very pale yellow, or straw colour, revolute; the upper segment rather the broadest. Lip, as well as the incurved point of the filament, spotted with crimson. We have never been able to procure any specimen or account of the fruit, which is perhaps in consequence of the great increase of the roots, not often perfected, or if produced, it is most probably overlooked by the cultivators, who may find it expedient for the advantage of their crop, to cut away the stalks before they run to seed.

2. *Z. Zerumbet*. Broad-leaved Ginger. Roscoe n. 2. Ait. n. 2. Sm. Exot. Bot. v. 2. 105. t. 112. (*Z. spurius*; Koenig in Retz. Obf. fasc. 3. 60. *Z. latifolium* sylvestre; Herm. Lugd.-Bat. 636. t. 637. Amomum Zerumbet; Linn. Sp. Pl. 1. Willd. Sp. Pl. v. 1. 6. Jacq. Hort. Vind. v. 3. 30. t. 54. Lampung; Rumph. Ambon. v. 5. 148. t. 64. f. 1. "Katou-infchi-kua; Rheede Hort. Malab. v. 11. 27. t. 13.")—Bractæas ovate, obtuse. Segments of the outer limb of the corolla straight. Middle lobe of the lip cloven, slightly wavy. Rib and sheaths of the leaves smooth.—Native of the East Indies. The roots are said to be bitter, without the flavour and pungency of the true Ginger; but the young foliage, according to Rumphius, is used in Amboyna as a pot-herb. This species is not uncommon in our stoves, being easy of culture, and flowering frequently at the end of autumn. Many persons who grow it think themselves possessed of the real Ginger. The habits of the two plants are indeed very similar, but the barren stems of the present species are rather the tallest, being four or five feet high, with elliptic-lanceolate leaves; silky beneath when young. Flower-stalks eighteen inches or two feet high, thick and firm. Spike ovate. Flowers pale yellow, without scent, each lasting but a few hours. Upper segment of the outer limb ovate, erect, concave; two lower ones lanceolate. Lip yellow, its large central lobe emarginate.

3. *Z. Cafumunar*. Cafumunar, or Hairy Ginger. "Roxb. in Asiatic Researches, v. 11. 347. t. 7." Sims in Curt. Mag. t. 1426. Ait. Epit. 376. (Cassumuniar; Dale Pharmac. 275. Cafumunar; Lewis Disp. ed. 4.

121.)—Bractæas ovate, rather acute. Segments of the outer limb of the corolla straight. Middle lobe of the lip cloven, dilated, crisped, and crenate. Rib and sheaths of the leaves hairy.—Native of the East Indies, from whence it was sent by Dr. Roxburgh to this country, and flowered in August 1811, in the stove of James Vere, esq. at Kensington Gore. The roots had long ago been introduced into the Materia Medica as a powerful stimulant and tonic, in hysterical, paralytic, and other nervous disorders, possessing a warm bitterish flavour, with the smell of Ginger; but they have long gone out of use. Their shape is less elongated and compressed than that of Ginger, and more annulated, tuberous or knotty. *Herbage* most like the last species, but distinguished by the hairy sheath and mid-rib of the leaves. *Flower-stalks*; not above six or eight inches high. *Spike* ovate, brownish. *Corolla* pale yellow, distinguished from *Z. Zerumbet* by the greatly dilated, inversely heart-shaped, crisped and crenate, middle lobe of its lip; the two side lobes being erect and entire, not larger than in *Zerumbet*. The plant is said to be propagated by cuttings of the root.

4. *Z. Mioga*. Japanese Ginger. Roscoe n. 3. Ait. n. 3. (Amomum Mioga; Thunb. Jap. 14. Willd. Sp. Pl. v. 1. 7. Banks Ic. Kæmpf. t. 1. Desjooka, vulgò Mjoga, seu Mioga; Kæmpf. Am. Exot. 826.)—Bractæas ovate, acute. Spike nearly sessile. Segments of the outer limb of the corolla erect, acute. Middle lobe of the lip concave, entire.—Found near Nagasaki, and in other parts of Japan, flowering in September. *Thunberg*, Kæmpfer speaks of this as an eatable kind of Ginger, with a mild flavour. The leafy stems are from one to two feet, or more, in height, and with the foliage resemble those of the three foregoing species. The flower-stalk is radical, and remarkably short, or scarcely any. Spike ovate, with numerous, large, white, pointed, striated, concave bractæas; the outer ones largest, concealing many within. The flowers smell faintly like Butter-bur, and have a yellow, very concave, undivided lip, and a white limb. Filament greenish-white, beaked, embracing the thread-shaped style, according to the generic character, as is faithfully described by Thunberg, who speaks of the fruit as a nearly ovate, obtuse capsule, with three cells and three valves, and numerous minute seeds, inserted into the central column.

5. *Z. roseum*. Rose-coloured Ginger. Roscoe n. 4. (Amomum roseum; Roxb. Coromand. v. 2. 15. t. 126.)—Bractæas lanceolate, coloured. Spike nearly sessile. Segments of the outer limb of the corolla revolute. Middle lobe of the lip flat, entire.—Native of moist valleys in Hindoostan, flowering in the rainy season. The Telings call this plant Bumacatechicay. Root creeping, cylindrical, branched, not knotty. No aromatic or other quality is recorded concerning it, or any other part of the plant. Leafy stems two or three feet high. Spikes nearly sessile at the root, ovate, two or three inches long. Bractæas loosely imbricated, erect, lanceolate, acute, of a fine rose colour, as are also the calyx, and the narrow revolute segments of the outer limb of the corolla. The lip is whitish, obovate, entire, not concave, but somewhat reflexed. Beak of the filament yellow. No account is given of the seed-vessel.

6. *Z. purpureum*. Purple Ginger. Roscoe n. 5. Ait. n. 4.—"Bractæas ovate, coloured. Segments of the outer limb of the corolla erect. Middle lobe of the lip divided."—Native of the East Indies. Introduced into the English stoves, by the right honourable Sir Joseph Banks, in 1796, and observed by Mr. Roscoe in the Botanic garden at Liverpool. It flowers in September.

ZINGIBER, in the *Materia Medica*. See GINGER.

ZINGIS, otherwise JENGHIZ-KHAN, or *Genghis-khan*, in *Biography*, the founder of the Mogul empire, was the son of Bifukai, or Jefukai, a chief over thirteen hordes of Moguls in the Tartarian range between China and the Caspian sea, and born about the year 1161 or 1163, his first name being Temugin. In the year 1205 he was installed in the Mogul empire, and declared his purpose of giving a new code of laws to the nation; the object of which was the preservation of peace at home, and the conduct of war abroad. The penalty of death was denounced against murder, adultery, perjury, and the theft of a horse or ox, which were the chief articles of Tartarian property. The nation was interdicted all servile labour, the performance of which was assigned to slaves and strangers, and was consecrated to the sole profession of arms. The weapons which they were appointed to use were bows, scymetars, and iron maces; and the troops were distributed into divisions of hundreds, thousands, and tens of thousands. The soldiers and officers were made individually responsible for the safety and conduct of one another; and it was an established rule, that peace should never be granted without previous conquest. With regard to religion, Zingis established universal toleration. As for himself, his only article of faith was the existence of one God, the creator and governor of all things; but his Mogul and Tartar subjects were idolaters, Jews, Christians, and Mahometans, all of whom were allowed to practise their several rites without molestation, and without any difference of privileges. Having thus settled the affairs of the proper Mogul empire, he successively, by his own arms, and those of his lieutenants, reduced the different tribes of the desert, and rendered himself the undisputed monarch of the pastoral nations who pitch their tents from the wall of China to the Volga. For a sketch of his conquests, we refer to the article of the *MOGUL Empire*. These conquests were attended with many acts of savage cruelty. In his invasion of Kitay, the northern empire of China, he took 90 cities, destroyed by fire a number of towns and villages, and massacred many thousands of people; at the same time obliging the Kin emperor to purchase peace at the price of a Chinese princeling, 500 youths and maidens, 3000 horses, and a large tribute in gold and silk. At his departure, he inhumanly ordered all the children whom he had taken in four provinces to be butchered. In a second expedition he laid siege to the capital city Yen-king, now called Peking, which, after a long resistance and grievous suffering by famine, was stormed by the Moguls, with the conflagration of the imperial palace; and after the desolation of China, its five northern provinces submitted to the dominion of the Mogul conqueror. In the bloody conflicts between Zingis and Mohammed, sultan of Kharifin or Charafin, all the rich and populous cities and countries of Tranfoxiana, Kharifin, and Khorafan, were taken or laid waste by the Moguls. Mohammed died a fugitive in a desert island of the Caspian sea; but his son, Gelaeddin, boldly resisted the invader, and checked his progress, till overpowered by numbers on the banks of the Indus, he was under a necessity of spurring his horse into that rapid river, the opposite side of which he reached in safety. Zingis, admiring his heroism, and forbidding the pursuit of him, said to his sons, "Any son might wish to spring from such a father." Nevertheless he ordered all the sultan's male children to be killed. After the defeat of Gelaeddin, Zingis, remaining for some time in Khorafan, pursued his customary operations of sacrificing lives, and desolating whole tracts of country. Returning to Bokhara, or Bucharia, in 1223, he investigated the antiquities of Balk and the doctrines of Zoroaster, and held conferences with the Mahometan doctors; the result of which

was his assent to their tenets, the necessity of a pilgrimage to Mecca excepted. In 1224 he held a grand diet in the plain of Tonkai, which, though seven leagues in length, could scarcely contain the tents of all the distinguished persons that were assembled. In the following year he passed through Tartary to the borders of northern China, and subjugated the kingdom of Hya or Tangut. In the province of Shen-fi, on the mountain of Lu-pai, whither he went in order to pass the summer heats, he was taken ill; and as he perceived his end approaching, he summoned the generals of his army, before whom he declared his fourth son regent, till the arrival of his brother Oetai, whom he appointed his successor in the dignity of grand khan of the Moguls and Tartars. Recommending unanimity, and advising the conduct of the war against Kin, he expired in August 1227, at the age of 66 years. His remains were interred with great pomp under a beautiful tree which he had fixed upon in returning from a hunting expedition. He had many wives, and left a numerous progeny. "This emperor," says one of his biographers, "possessed the civil and military qualities necessary for the founder of a mighty monarchy, together with a penetrating and inquiring mind, which, with superior culture, might have placed him in the list of truly great princes. His memory now survives as that of one of the great conquerors whose deeds have astonished the world, to which they have proved the most terrible of scourges. His simple laws were long the rule of the countries he governed, and are still religiously observed by the Crim Tartars." D'Herbelot. Gibbon's Hist. Univ. Hist. Gen. Biog.

ZINGST, in *Geography*, a small island in the Baltic, near the coast of Pomerania, and a little to the west of the island of Usedom. N. lat. 54° 28'. E. long. 12° 50'.

ZINIAR, a name given by the old chemical writers for verdigrise.

ZINIAT, a word used by the old chemical writers to express either the action of fermentation, or any thing that is capable of exciting it in bodies.

ZINK. See ZINC.

ZINKOW, in *Geography*, a town of Poland, in Podolia; 32 miles N. of Kaminiac.

ZINN, JOHN GODFREY, in *Biography*, an anatomist and botanist, was born in 1726, studied under Haller at Gottingen, and became botanical professor in that university. His first experiments were undertaken in order to ascertain the sensibility of different parts of the brain; he then proceeded to the examination of the eye, which produced his esteemed work, intitled "Descrptio Anatomica Oculi Humani, Iconibus illustrata," Gotting. 4to. 1755. Botany was also the subject of his assiduous study, the result of which appeared in several papers, and in a catalogue of the plants in the academical garden and vicinity of Gottingen, arranged according to the system of Haller. His premature death happened at the age of 32, in April 1758. He was a member of the Academy of Sciences at Gottingen, the Institute of Bologna, and the Royal Society of Berlin. Haller. Eloy.

ZINNA, in *Geography*, a town of the duchy of Magdeburg; 18 miles N. of Wittenberg.

ZINNIA, in *Botany*, was so named by Linnæus, in honour of Dr. John Godfrey Zinn, professor of physic and botany at Gottingen, author of a *Catalogus Plantarum Horti Academici et Agri Gottingensis*, printed there in 1757. This work, making an octavo volume, is classed after Haller's method. Its author has, besides, published various botanical and physiological treatises, and would probably have contributed much more to the advancement of science, had he not been cut off, at the early age of 32, in 1758. Haller, whose

ZINNIA.

whose disciple and successor he was, speaks of him with much complacency; but it is easy to see that his favour was greatly conciliated by Dr. Zinn's preference of his system to that of Linnaeus. One principle of the learned Swede he indeed very justly approved, that plants nearly related on the whole ought not to be separated on account of a difference in one particular part. Yet in the application of this rule he surely has wandered widely from the truth, in wishing to unite *Geum*, *Comarum*, *Potentilla*, *Tormentilla*, and *Fragaria*. Such it seems was the avowed opinion of Zinn, in his *Praelectio*, published in 1755; but he has not followed it in his work above-mentioned. In that volume occurs, if we mistake not, the first figure of a *Zinnia*, under the name of a *Rudbeckia*; though the author justly declares it to constitute an indubitably new genus.—Linn. Gen. 437. Schreb. 563. Willd. Sp. Pl. v. 3. 2139. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 91. Pursh 565. Juss. 188. Lamarck Illust. t. 685. Gærtn. t. 172.—Class and order, *Synsphaesia Polygamia-superflua*. Nat. Ord. *Compositae oppositifoliae*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Common Calyx* ovato-cylindrical, smooth, imbricated, with numerous, obtuse, erect, permanent scales. *Cor.* compound, radiated. Florets of the elevated disk several, all perfect, funnel-shaped, five-cleft, internally villos; those of the radius from five to ten, ligulate, roundish or oblong, abrupt, larger than the disk, permanent. *Stam.* in the perfect florets, Filaments five, very short; anthers united into a cylindrical tube. *Pist.* in the perfect florets, Germen oblong, with two very unequal awns; style thread-shaped, cloven half way down; stigmas two, erect, obtuse: in the female florets, Germen oblong, triangular, without awns; style capillary, cloven half way down; stigmas two, recurved. *Peric.* none, except the unchanged calyx. *Seeds* in the perfect florets, solitary, oblong, quadrangular, compressed. Down of two points, one of them awned. In the female florets solitary, pointless, crowned with the permanent petal. *Recept.* chaffy, with tongue-shaped, channelled, deciduous scales, the length of the calyx.

Effl. Ch. *Receptacle* chaffy. Seed-down of two erect unequal awns. Calyx imbricated, somewhat ovate. Florets of the radius from five to ten, permanent, undivided.

1. *Z. pauciflora*. Yellow Zinnia. Linn. Sp. Pl. 1269. Willd. n. 1. Ait. n. 1. (*Bidens calyce oblongo squamoso, feminibus radii corollæ non deciduâ coronatis*; Mill. Ic. v. 1. 43. t. 64. *Rudbeckia foliis oppositis hirsutis ovato-acutis, calyce imbricato cylindrico, radii petalis pifillatis*; Zinn. Gott. 409. t. 1. *Chrysozonum peruvianum*; Linn. Sp. Pl. ed. 1. 920, excluding the synonym, which is wrong, and a heap of confusion; see Feuillé 766.)—Flowers sessile. Leaves somewhat heart-shaped, sessile, clasping the stem.—Native of Peru. Cultivated by Miller, but not commonly preferred in our gardens like the following, being less hardy, and not so ornamental. The root is annual. *Stem* erect, three or four feet high, branched, angular, leafy. *Leaves* opposite, deflexed, two or three inches long, acute, roughish, entire, rough-edged, with three principal ribs; their base broadish-heart-shaped. *Flowers* solitary at the ends of the branches, nearly or quite sessile, with the uppermost pair of leaves close to the base of the calyx; disk brownish; radius yellow. We perceive a difference between several specimens and figures of this plant, but cannot trace an absolute or constant specific distinction between them. In the Linnaean specimen, the small number of florets justifies the specific name, and the flower itself is quite sessile. This is undoubtedly Miller's plant, though the radiant florets are much numerous in his figure, and the whole flower larger. A specimen under this same name of *pauciflora*, given us by

Mr Joseph Banks, from Jacquin's herbarium, is what Zinn's figure exactly represents. The leaves are shorter, more rounded and heart-shaped, and the flower is large, with more or less of a stalk. Its radiant florets are numerous, broad, and yellow. How far these characters are permanent, culture and repeated observations must determine. We are rather inclined to suspect the Linnaean specimen, raised in the Upsal garden, is a starved one, the flowers perhaps being rendered diminutive by their lateness. It is most probable that a portion of the same seed was sent by Jussieu to Linnaeus and to Miller. The plant indeed flowered at Upsal before the year 1753, when Miller says he received his seeds, because it is described, in the first edition of Sp. Pl. printed that year, from the garden specimen now before us.

2. *Z. multiflora*. Common Red Zinnia. Linn. Sp. Pl. 1269. Willd. n. 2. Ait. n. 2. Pursh n. 1. Curt. Mag. t. 149. Linn. Dec. 23. t. 12. Jacq. Obf. fasc. 2. 19. t. 40.—Flowers stalked. Leaves opposite, ovato-lanceolate.—Native of North America. Found on the banks of the Mississippi, flowering in July and August. Annual. Rays yellow, orange, and sometimes brick-red. *Pursh*. The latter colour is most common in the gardens of Europe, where this plant is treated as a rather tender annual, like the different species of *Tagetes*, being best raised on a hot-bed, and planted out so as to flower in the autumn. A yellow variety, almost equally common, is less singular and striking in colour. We are not by any means certain that this variety may not be sometimes taken for the foregoing; yet the plant of Zinn and Jacquin, of which we have just given an account, is too different in the great breadth of its leaves to be confounded with the present species. The *Z. multiflora* has a more hairy stem than the *pauciflora*, much narrower and elongated leaves, with three ribs; their surface roughish to the touch. The flowers stand each on a hollow, deeply furrowed, terminal stalk, from one to two inches long, much thicker than the stem, and gradually swelling upwards. The disk is conical and acute, composed of reddish or tawny florets, accompanied by the prominent, dark-green, or blackish, scales of the receptacle: the radius consists of ten or more broad, elliptical, usually emarginate florets, of a deep brick-red, and very smooth, above; pale, greenish, and rough beneath; reticulated with veins, and finally becoming rigid, or membranous.

3. *Z. verticillata*. Whorl-leaved Zinnia. Andr. Repof. t. 189. Willd. n. 3. Ait. n. 3.—Flowers stalked. Leaves whorled, ovato-lanceolate. Radiant florets very numerous.—Native of Mexico. Raised by Messrs. Lee and Kennedy at HammerSmith, about the year 1789. We cannot suppose this to be any thing more than a luxuriant variety of the last. Annual plants, pampered with manure, and every possible advantage of cultivation, are liable to acquire aggregate leaves, double flowers, and many other characters, which do not appear in a state of nature. These it is the business of the gardener to encourage, and of the botanist to beware of. Having seen no specimen of this plant, we can only judge by the figure, in which we cannot discover any specific distinctions. The flowers indeed are rendered very splendid, by their multiplied radius of a deep scarlet, and their disk seems broader, and less conical, or pointed, than in either of the foregoing species. This last character, if constant, is more material than any which has been mentioned.

4. *Z. elegans*. Purple-flowered Zinnia. Jacq. Ic. Rar. t. 589. Willd. n. 4. Ait. n. 4. (*Z. violacea*; Cavan. Ic. v. 1. 57. t. 81. Andr. Repof. t. 55.)—Flowers stalked. Leaves opposite, ovate-heart-shaped, sessile, clasping the stem, harsh on both sides. Scales of the receptacle jagged and fringed.

fringed. Tubular florets with a hairy disk.—Native of Mexico; said to have been brought to England from Madrid, in 1796, by the late marchioness of Bute; whose botanical acquisitions in Spain, made with no less intelligence than taste, have eminently enriched the gardens of England. This is also a tender annual, flowering from Midsummer to the end of autumn. The *herbage* is flouter, the *leaves* broader, and much more harsh to the touch, like a file, than in any other of the genus. *Flowers*, in a cultivated state at least, as large as the last, with a conical, but rather obtuse, disk; the prominent orange-coloured scales of the *receptacle* have many finely-fringed segments; the upper surface of the yellow tubular florets is densely shaggy; the *radius* consists of numerous, spreading, obovate florets, of a deep lilac, or light purple, colour, less harsh, or scarious, after flowering than in the *multiflora*.

5. *Z. tenuiflora*. Slender-flowered Zinnia. Jac. Ic. Rar. t. 590. Willd. n. 5. Ait. n. 5. Curt. Mag. t. 555. (*Z. revoluta*; Cavan. Ic. v. 3. 26. t. 251.)—Flowers stalked. Leaves opposite, ovato-linearolate, pointed. Calyx cylindrical. Radiant florets linear, revolute.—Native of Mexico. Raised here in 1799, by the late captain Woodford, at Vauxhall. This very distinct species requires the same treatment as the rest. They may all, perhaps, succeed, in favourable seasons, as hardy annuals, but are best raised with artificial heat in the spring. The present has much narrower leaves than the last, which moreover are nearly smooth. The flowers are the smallest of their genus, and distinguished by their bright red, narrow, revolute radiant florets, very rough at the edges; the tubular florets are yellow, roughish in their disk.

ZINNIA, in *Gardening*, contains plants of the annual flowering kind, in which the species cultivated are, the few-flowered yellow zinnia (*Z. pauciflora*), and the many-flowered red zinnia (*Z. multiflora*).

These are both plants of the annual flower kind.

Method of Culture.—These annual plants are increased from seeds, which should be sown on a slight hot-bed in the early spring, as March; and when the plants are a few inches high, they should be pricked out on another bed previously prepared to receive them, where they should remain till the advance of summer, when they may be taken up and planted out in the borders of the pleasure-ground, where they blow and complete their seeds for the year following.

They have a fine effect in their leaves and flowers in these situations.

ZINNORE, in *Geography*, a town of Hindoostan, in Guzerat, on the Nerbuddah; 30 miles N.E. of Baroach.

ZINTEN, a town of Prussia, in the province of Natangen, near which the Poles were defeated in 1520; 30 miles S.S.W. of Königsberg. N. lat. 54° 23'. E. long. 20° 20'.

ZINTI, a town of South America, in the viceroyalty of Buenos Ayres, and archbishopric of La Plata; 90 miles S. of La Plata.

ZINU, a province of South America, in the viceroyalty of New Grenada, situated to the north of Choco, and west of Carthagena.

ZINU, or *Sinu*, a town of South America, and capital of a province, on a river of the same name, which runs into the Spanish Main; 90 miles S. of Carthagena. N. lat. 8° 58'. W. long. 75° 48'.

ZINWALD, a town of Bohemia, in the circle of Leitmeritz; 18 miles N.W. of Leitmeritz.

ZINZENDORF, NICHOLAS LOUIS, in *Biography*, was born at Dresden in May 1700, and was educated under the

inspection of his grandmother, who was a pious woman, accustomed to the perusal of the Scriptures. He was thus led into an early acquaintance with the principal doctrines of the Christian religion, and manifested a peculiar taste for spiritual songs. Under professor Franke at Halle, he became a good classical scholar; and his facility in composing verses was such, that he indited them faster than he could write them. Such, however, was his proneness to dissipation, and particularly gaming, that he squandered away not only his money, but all his effects. From his youth he was fond of forming religious societies, and it is said that he had established seven associations of this kind between the year 1710 and the year 1716, when he left Halle. One of his companions in forming these institutions was baron Frederick von Watteville, in intercourse with whom he first conceived the idea of attempting the conversion of the heathens. With this view they bound themselves by an oath, and determined to employ others in accomplishing this design who were properly qualified for the office. This resolution seems to have taken its rise from a baptized native of Malabar, who had been brought to Halle by the missionary Ziegenbalg. In 1716 Zinzendorf removed to Wittenberg, where he applied diligently to his studies; and in 1719 he quitted Wittenberg, in order to gratify his relations by pursuing his travels. On his tour he remained for some time at Utrecht, prosecuting his studies in history and jurisprudence; but his chief attention was directed to theology, as he had formed a purpose of becoming a preacher. From Holland he proceeded to Paris, where he associated with his friend, Henry, prince of Reufs, and endeavoured to spread his doctrine among the Catholic nobility, by some of whom they were treated with respect, while others contemptuously denominated them Jansenists and Pietists. At this time he was introduced by Father de la Tour, general of the Society of the Oratory, to the archbishop of Paris, and attempts were made, without effect, for gaining him over to the Catholic church. During his abode at Paris he formed an acquaintance with several other persons of distinction. From Paris he proceeded through Switzerland to Germany in 1720, and having arrived at Herndorf, in Lusatia, he found his grandmother still living, and employed himself in communicating instruction to the domestics, and corresponding with his friends. Soon after, retaining his purpose of becoming a preacher, he went to Dresden, and having received his property from those with whom it had been entrusted, he purchased the lordship of Bertholdsdorf, in Lusatia, and marrying a sister of the prince of Reufs, distinguished for her piety and virtue, he assigned to her his whole property, that he might not be incumbered and diverted from the prosecution of his design by the cares of the world. About the year 1722 he indulged the notion of a purer church discipline, of which he observed some traces among the Bohemian and Moravian brethren, who, from their earliest connection with the Waldenses and true followers of John Huss, had formed a peculiar religious community. The Christians of this description had undergone from the year 1458 to 1627 severe persecutions, so that they were almost extirpated from Germany; but a small number of them remained, under oppression, in Moravia; and about the year 1720 the sect revived: so that they held frequent meetings, read the Scriptures with their old books of hymns, celebrated in secret the holy sacrament, and introduced, at least in their houses, the ancient church discipline. One of their number, of obscure condition, obtained an introduction to count Zinzendorf, who gave them leave to settle on his estate at Bertholdsdorf. Availing themselves of this permission, a small number of them, consisting of three men, two

women,

women, and five children, came hither from Moravia, in Whitfuntide, 1722, and erected on a hill, in a wild marshy district, a wooden habitation, exposing themselves to the derision of the adjacent inhabitants. They were so poor that the countess sent them a cow to supply milk for their children. However, they gradually gained new converts; and when the count and his consort visited this new settlement of the Moravian brethren in the month of December, he gave them a cordial welcome, and falling upon his knees, pronounced a benediction on the infant colony. Such was the origin of the village of Hernhut. (See HERNHUTERS and MORAVIANS.) The count, whilst he afforded them protection, left them at full liberty to think for themselves; more especially as he found, upon examination, nothing improper in their doctrine. From this time, count Zinzendorf, in connection with some other persons similarly disposed, took pains in giving instruction to his subjects, and educating their children; avowing himself a true Lutheran, but wishing that his people might remain totally ignorant of the disputes that subsisted among Protestant divines. In 1723 he published a small catechism, entitled "The pure Milk of the Doctrine of Jesus," which, he says, cost him more labour than all his other works. The count, devoted to the prosecution of the work he had undertaken, resided sometimes on his estate in Lusatia, and sometimes at Dresden, but declined every offer of a place at court. He employed himself in the composition and occasional publication of books adapted to his design; one of which, being a periodical work, and entitled "The German Socrates," was suppressed by order of the council, probably because it censured the prevailing indifference about religion, and called upon his fellow-citizens to live in a manner more agreeable to what their religion required, or entirely to renounce it. In 1727 he quitted Dresden, that he might be nearer his favourite object Hernhut, and that he might be at leisure to devote his whole time and attention to the improvement and increase of his congregation. With this view he made a tour through the greater part of Germany, occasionally preaching, and endeavouring to gain converts. In 1731 he extended his tour to Denmark, and being present at the coronation of Christian VI., who conferred upon him the order of Dannebrog, which five years afterwards he resigned, because he thought it improper to appear as the instructor of his flock with the insignia of his order. In this tour he acquainted himself with the state of the Danish missions in the East Indies and Greenland; and on his return he took measures for carrying into execution the design he had formed at Halle with his friend Watterville. From this commencement, in the year 1732, arose that missionary system of the Moravians which has since been so widely and so wonderfully extended. Between 1732 and 1766 nearly 4000 negroes in the Danish islands were baptized; and in 1768 the congregation of New Hernhut and Lichtenfels, in Greenland, amounted to 704 persons. When the congregation at Hernhut had increased in 1732 to 500 persons, the Saxon court became alarmed, and appointed a commission for the purpose of examining their doctrine and principles. Although they were found to be inoffensive, the count was forbidden to bring any more new emigrants from Moravia; and soon after he received an order to sell his estate and property, which was a kind of sentence of banishment from his country. He also perceived a coldness and reserve in the disposition of his friends. Accordingly he quitted Hernhut, and repaired to his friend count Reufs at Eberdorf. He now thought seriously, as he had done twenty years before, of entering regularly into the church; but the countess and his

friends dissuaded him from adopting this measure. With a view of becoming tutor to the children of Richter, a merchant at Stralsund, to which he was urged by his pecuniary circumstances, he was examined for orders, and having obtained a flattering testimonial, was formally ordained at Tübingen. But a change taking place in the circumstances of Richter, this plan did not succeed. In 1735 he made an attempt to visit Sweden, but was forbidden to enter the kingdom by an order of government; and this occasioned the composition of one of his most important works, entitled "A Letter to the King of Sweden in regard to the general Belief of himself and Congregation," which he widely circulated, and which produced various plans for extirpating the Moravian brethren from the empire. In the same year he visited Switzerland, and in 1736 he and the countess made a tour to Holland, where, at the desire of the princess dowager of Orange, he founded a new colony at Yffelseite, called Heerendyk, which was afterwards removed to Zuyft. On his return he found at Cassel a copy of a Saxon rescript, by which he was forbidden the territories of that electorate, and banished from his native country. He was thus reduced to the necessity of making various excursions; and on his return he was invited to a conference with the king of Prussia, who was so well satisfied with his doctrine and character, that he advised him to be regularly ordained. For this purpose he recommended him to the chief court preacher Jablonky, by whom he was consecrated bishop of the Moravian congregation in May 1737. In this year he visited London, and established the brotherhood in England. Here he became acquainted with John Wesley, and maintained a dispute with him on the impossibility of men's attaining moral perfection, for which the English preacher contended. Although he obtained permission to return to Hernhut, it was on condition of his making certain declarations with which he could not comply, and therefore he became a voluntary exile; and was forbidden ever to enter Saxony. In the year 1738 he undertook his first voyage to America, in the course of which he composed a work entitled "Jeremiah a Preacher of Righteousness." Upon his arrival at the island of St. Thomas, he found that all the missionaries had been thrown into prison, but he immediately procured their release, and liberty for his congregation to assemble. After his return he visited Holland and Switzerland, wrote in his own defence against the accusations of his German enemies, and held public assemblies at Geneva. In 1742 he made a second voyage to America, and preached alternately with their own minister to the Lutheran congregation at Germantown, in Pennsylvania, and built for them a place of worship. In a Latin speech at Philadelphia he laid aside the title of count, and assumed the name of Von Thunstein, which belonged to his family. The Quakers generally styled him friend Lewis. He also established the celebrated colony at Bethlehem, and made a tour among the Indians, who received him favourably, and, as a token of their friendship, gave him the wampum belt. In America, however, he suffered much abuse and calumny. In 1743 he returned to Europe; and having proceeded to Riga with a view of settling some differences among his followers at Livonia, he was arrested, conveyed to the frontiers, and ordered never to enter the imperial territories any more. In 1747 he obtained permission to return to Saxony, after an exile of ten years; and the king, having received from one of the Moravians a considerable sum of money for the castle of Barby and district of Doben, issued a declaration that the society should be allowed, in every part of his territories, the same privileges which they had enjoyed at Hernhut. In 1748

he succeeded in obtaining a commission, which, after particular examination, declared the members of the Moravian community to be true adherents to the Augsborg confession. In the following year he visited England, and obtained an act of parliament for the protection of his followers in the British dominions in America. In 1757 he made his last tour to Switzerland, and from thence proceeded to Holland. In 1760 he died at Hernhut, after an illness of four days, and his funeral was attended by 2000 of his followers, and as many spectators; and his coffin was carried to the grave by thirty-two preachers and missionaries, some of whom had come from Holland, England, Ireland, North America, and even Greenland. Count Zinzendorf was somewhat above the middle size; and his countenance combined ferociousness with animation. In early life his manners were elegant, but as he withdrew from intercourse with the world, in more advanced life they became stiff and reserved. To money he was perfectly indifferent, and as he gave to every mendicant, he was often penniless. His disposition was lively, but he was capable of long-continued and intense application. His memory was prompt and comprehensive, but as he was of a lively imagination it was not very retentive. In his style he bid defiance to all the rules of grammar, and his ambiguous mode of expression subjected him to many inconveniences, so that his meaning was often mistaken and misrepresented. To persons of the lower order he was condescending, and in his intercourse with all mild and candid. In his temper he was irritable and passionate, but placable and forgiving. His activity in doing good and serving others was indefatigable and unbounded; he often promised, it is said, with the best intentions, beyond his ability of performance; and he is charged with having used art and flattery to carry on his own purposes, and to gain converts to his cause. Mosheim, &c. Gen. Biog.

For a further account of the tenets and partisans of the sect with which he was connected, and of which he was, according to his own statement, a reformer, and not a founder, we refer to the articles HERNHUTERS, MORAVIANS, and UNITAS Fratrum.

ZINZIBER, GINGER. See ZINGIBER and GINGER.

ZINZIBER Rubrum, Red Ginger, a name by which some authors have called the official casumunar-root.

ZINZIBER Caninum, Dog's Ginger, in Botany, a name given by some of the old writers to the *perficaria urens*, or biting arsmart; a plant which is very hot, and pungent to the taste, and grows in watery places. It had hence the name of *hydropiper*, water-pepper, among the Greeks, and was called *zinziber caninum*, or dog's ginger, by Avicenna and others, from its heat, and from an opinion that it would poison dogs that eat of it.

The Arabian name is *zinzibil alkele*.

ZINZIBER Caninum is also a name given by some authors to the *capficum*, or Guinea-pepper. Ger. Emac. Ind. 2.

ZINZIG, or SINZIG, in Geography, a town of France, in the department of the Roer; 18 miles N.N.W. of Coblenz. N. lat. 50° 33'. E. long. 7° 12'.

ZINZILLA, a name by which some medical writers have called that species of the herpes, which we usually call the shingles.

ZINZOACZA, in Geography, a town of Mexico, in the province of Mechoacan, anciently the residence of a cacique.

ZIOBERIS, in Ancient Geography, a river of Asia, in Hyrcania, which discharged itself into the Rhydage, according to Quintus Curtius. Diodorus Siculus calls it *Sibtoetes*.

ZIOLO, in Geography, a town of Italy, in the Paduan; 10 miles S.E. of Padua.

ZION, in Ancient Geography. See SION and JERUSALEM.

ZIPH, a town of Palestine, in the tribe of Judah. (Joh. xv. 24.) St. Jerom says, that in his time they shewed the village of Ziph, 8 miles from Hebron eastward. David for some time concealed himself in the wilderness of Ziph. (1 Sam. xxiii. 14, 15.) There was another city called Ziph, near Maon and Carmel of Judah. Joh. xv. 55.

ZIPHRON, or ZEPHRONIA, a city N. of the land of promise, now unknown. Numb. xxxiv. 9.

ZIPOETIUM, a town of Asia Minor, in Bithynia, near mount Lyperus, and which had been founded by king Zipoteus. Steph. Byz.

ZIPPORIS, a name which the ancients gave to the town of Sefora or Sauffori. It was the strongest place in Galilee, and its position might be regarded as the key of the province, according to Josephus.

ZIPSERCHLOSS, in Geography, a town of Hungary; 6 miles E. of Leutfch.

ZIRBALIS HERNIA, a term used by medical writers to express that kind of rupture which is caused by a defect of the omentum into the scrotum.

ZIRBUS, the name by which the Arabian physicians have called the omentum.

ZIRCON, in Mineralogy, *Jargon de Ceylon*, Romé de Lisle, Zircon, Haüy, a gem originally found in the island of Ceylon, in the sands of rivers, along with spinel, sapphir, temmaline, and iron-sand. Zircon, the gem called the hyacinth, and zirconite, are regarded by most mineralogists as varieties of the same species. They are essentially composed of the earth called zircon, (see ZIRCONIA, in Chemistry), with silica, and a minute portion of iron, which may be regarded merely as the colouring matter. The primitive form of the crystals of zircon, according to Haüy, is an octahedron, composed of two four-sided prisms, whose sides are isosceles triangles. The inclination of the planes of the same pyramid to each is 124°.12; the inclination of the sides of one pyramid to those of the other 82°.50. The angle of the summit is 73°.44. The common forms in which it occurs are rectangular four-sided prisms, rather flatly terminated by four-sided pyramids, the planes of which are set on the lateral planes of the prism under equal angles. The above figure is often truncated in the lateral edges. The angles of the prism, in junction with the pyramid, are often bevelled, and sometimes the prisms are terminated by four planes at each end, two of which at each end form very obtuse angles, and are set on the lateral planes of the prism. The crystals are generally small, and occur loose or imbedded. The surface of the crystals is sometimes rough, and sometimes smooth and shining; that of the grains is uneven, and glistening internally. Zircon is splendid or shining, with a lustre intermediate, between adamantine and resinous. The structure is imperfectly foliated, with the folia parallel to the lateral edges of the prism. The fracture is flatly conchoidal. The prevailing colour of zircon is grey; it is sometimes white, green, and brown, and occasionally yellow, blue, and red. The colours are pale; it is sometimes transparent, but more frequently semi-transparent or translucent: it refracts doubly. Zircon is harder than quartz, but softer than the diamond. The specific gravity varies from 4.5 to 4.7. It is infusible without addition by the blow-pipe.

According

According to Klaproth, the constituent parts are,

Zircon	-	-	69	63
Silex	-	-	26.50	33
Oxyd of iron	-	-	50	1
			<hr/>	<hr/>
			96.	97

Hyacinth: Zircon Hyacinth, Brongniart. — The prevailing colour of this mineral is orange-red; it is sometimes yellow, grey, and green, and very rarely white. It occurs in angular grains, but more frequently in small crystals, which have the following forms. A rectangular four-sided prism, terminated by four rhomboidal faces at each end, set on the lateral edges of the prism; the prism is sometimes truncated on the edges. Sometimes it occurs in an irregular garnet-shaped dodecahedron, and sometimes in a flat octahedron. The structure is foliated; it has a double rectangular cleavage, and the folia are parallel with the diagonal of the prism. Hyacinth is transparent or translucent, and refracts doubly: the lustre is resinous-vitreous and splendid. It is very hard, scratching quartz with ease. The specific gravity varies from 4.3 to 4.7. Before the blow-pipe it loses its colour, but not its transparency, and is infusible. According to Klaproth, the constituent parts of hyacinth of Ceylon are,

Zircon	-	-	-	70
Silex	-	-	-	25
Oxyd of iron	-	-	-	0.50
Loss	-	-	-	4.50
				<hr/>
				100.

According to Vauquelin, the constituent parts of hyacinth of Expailly are,

Zircon	-	-	-	64
Silex	-	-	-	32
Oxyd of iron	-	-	-	2
Loss	-	-	-	1
				<hr/>
				99

Zirconite does not appear to differ from zircon, except in the situation in which it is found. It occurs in small crystals of a reddish-brown colour, imbedded in sienite. According to Klaproth, its constituent parts are,

Zircon	-	-	-	65
Silex	-	-	-	33
Oxyd of iron	-	-	-	1
				<hr/>
				99

Zircon and hyacinth, as we have stated, were originally found in Ceylon; they have since been found in various parts of Asia and Europe.

Zircon occurs in considerable quantities along with sapphire and iron-sand in volcanic sand, in a rivulet near Expailly in Auvergne; also near Pifa, and in the volcanic sand of the Vicentine. It has been found in trap-rocks in Bohemia, and in the vicinity of Lisbon. It was first found in its native situation at Freidrickshwarn, in the district of Christiana, in Norway, imbedded in sienite. It was also found in basalt near Expailly, and in the mountain of Anise in Auvergne, and also in volcanic scoria in the same

country. It has been found in rolled masses of sienite by professor Jamefon in Scotland, in the county of Galloway; and has since been met with in granite near Cuffel, in Dumfriesshire.

Zircon has been found in South America, and in the province of New Jersey, in the United States.

Zircon and hyacinth are characterized by their great specific gravity. Common zircon has been frequently confounded with the diamond, but the specific gravity alone would be sufficient to distinguish them; that of the diamond not exceeding 3.5. The hyacinth has often been confounded with other minerals. The oriental hyacinth of Romé de Lisle is orange-coloured sapphire. The occidental hyacinth of Dutens is yellow-coloured topaz.

Cruciform hyacinth is cross-stone; brown volcanic hyacinth is vesuvian; white hyacinth of Somma is meionite.

The hyacinth of Dessentis, mentioned by Sauffure, is a variety of garnet.

Common zircon is frequently cut and polished by the jewellers as a gem. The greyish-white and yellowish-white varieties are the most prized, on account of their resemblance to the diamond. The darker coloured varieties may be deprived of their colour by heat. It is cut into the same forms as the diamond, and exhibits faintly the same play of colours, and is not unfrequently fold as an inferior kind of diamond. The hyacinth is also employed by jewellers in various kinds of ornaments; but pale garnets and rock crystals are frequently fold for hyacinths.

ZIRCONIA, or ZIRCON, in *Chemistry*, the name of a peculiar earth, hitherto only met with in the minerals termed *hyacinth*, and *zircon* or *jargon*. See the preceding article.

Zirconia exists in the form of a fine white powder, which feels rather harsh when rubbed between the fingers. It has neither taste nor smell. It is infusible before the blow-pipe; but when heated violently in a charcoal crucible it undergoes a sort of imperfect fusion, and acquires a greyish colour and porcelaneous appearance. In this state it is very hard, and its specific gravity is 4.3.

Zirconia is insoluble in water, but has a considerable affinity for that liquid. It does not combine with oxygen, azote, or any of the simple combustibles, but appears to have a strong affinity for many metallic oxyds, especially for that of iron.

It is insoluble in alkaline solutions, neither can it be fused with them by the assistance of heat; but it is soluble in the alkaline carbonates. Sir H. Davy subjected this earth to the action of galvanism, and obtained evidences of its containing a metal as its basis. To this metal he gave the name of *zirconium*. Nothing satisfactory is known respecting its nature.

No very accurate analysis of the salts of this earth have been yet made. From some experiments of Klaproth and Vauquelin, Dr. Thomson fixes the weight of its atom at 46.25, though it is probable that this is not to be absolutely relied upon.

Salts of Zirconia: Nitrate of Zirconia.—This salt may be formed by pouring nitric acid on newly precipitated zirconia. It always contains an excess of acid, and does not crystallize. It is decomposed by heat, and most of the vegetable acids, except perhaps the acetic.

Carbonate of Zirconia is a white insoluble powder. It may be formed by double decomposition with the alkaline carbonates, and solutions of zirconia in acids.

Sulphate of Zirconia.—This salt exists in the form of a white powder, but may be obtained in small needle-formed crystals. It has no taste, and is insoluble in water. It is easily decomposed by heat.

Acetate of Zirconia.—This salt has an astringent taste. It does not crystallize. It is very soluble in water and alcohol.

The other salts of zirconia are mostly white insoluble powders, very little known, and apparently possessing very little interest. With respect to the general properties of zirconia and its compounds, it may be remarked, that the alkalies and alkaline earth separate this earth from its combinations with acids. The salts of zirconia have an astringent, harsh, disagreeable taste, similar to some of the metallic salts. They are most of them insoluble in water. Those which are soluble yield white precipitates when sulphuric acid, carbonate of ammonia, oxalate of ammonia, tartrate of potash, and infusion of nut-galls, are dropped into their solutions. These properties sufficiently distinguish this earth from *alumina* and *yttria*. For further particulars respecting this earth, see the articles above referred to.

ZIRCONITE. See ZIRCON.

ZIRCONIUM, the metallic basis of zirconia. See ZIRCONIA *supra*.

ZIRIANKA, in *Geography*, a small river of Russia, which runs into the Enisei, near its mouth.—Also, a town of Russia, on the Niznei Tunguska. N. lat. 16° 16'. E. long. 106° 54'.

ZIRICZEE, a town of Holland, one of the most ancient in Zealand, and capital of Schouwen, built and surrounded with walls in the year 859, by a person named Ziringus, from whom it is called. It was the ancient residence of the comtes of Zealand, and was at that time a place of much more consequence than it is at present, the port being filled with sand. The inhabitants carry on a considerable trade in grain, salt, and fish: the town is large and populous, and has several good buildings; the church, called the "Munster," dedicated to St. Levisus, is a handsome structure. N. lat. 51° 40'. E. long. 30° 48'.

ZIRKNA, a river of Syria, which runs into the Mediterranean, 8 miles S. of Tortura.

ZIRKNITZ. See CIRKNITZ.

ZIRKWITZ, a town of Silesia, in the province of Oels; 14 miles N. of Breslaw.

ZIRL, or CIRL, a town of the county of Tyrol, on the Inn; 7 miles W. of Innspruck.

ZIRNOE, a town of Russia, in the government of Saratov; 32 miles S.W. of Saratov.

ZIRO, Lo, a town of Naples, in Calabria Citra; 9 miles E. of Umbriatico.

ZIROVAIA, a small river of Russia, which runs into the Penzinkaia gulf, 32 miles S.W. of Oklansk.

ZIRUA, a small island in the Mediterranean, near the coast of Tunis. N. lat. 33° 30'. E. long. 11° 39'.

ZIRWITZ, a town of Silesia, in the principality of Oels; 3 miles E. of Trebnitz.

ZIRZING, a town of Austria; 6 miles E. of Steyregg.

ZIS, a river of Africa, which rises in the Atlas, passes by Sugulmeffa, and loses itself in the sands, in the country of Tahlet.—Also, a mountain of Africa, between Sugulmeffa and Fez; 40 miles S.S.E. of Fez.

ZISEL, in *Zoology*, a name given by Buffon to the earless marmot, or *mus citellus* of Linnaeus. See CITELLUS.

ZISKA, JOHN, in *Biography*, a distinguished leader among the Hussites, who was the son of a Bohemian gentleman, named "De Trocznou," and celebrated for military valour in his youth. Ziska, denoting "one-eyed," was an appellation, which he bore in consequence of having lost an eye in a combat, on occasion of the perfidious execution of John

Hufs and Jerome of Prague, at the council of Constance. Their followers took up arms, and invited Ziska to be their commander. In 1519 he accepted the invitation; and having assembled a body of peasants, he soon disciplined them so as to be equal to veteran troops. From a fortress which he constructed on an elevated situation, and called Thabor, the Hussites derived the name of Thaborites. At the siege of Rabi he lost his other eye; but though totally blind, he executed his office as commander with great vigour and success. At Auffs on the Elbe he gained a complete victory over the Catholics, and left 9000 of them on the field, retaliating the severities which they inflicted on the Reformers, by demolishing their churches, committing their priests to the flames, massacring those who were prisoners, and laying waste their country, and thus rendering his name formidable. Having made himself master of the new town of Prague, it was invested by the emperor Sigismund and other princes: but Sigismund, being defeated with great slaughter by the Thaborites, was obliged to retreat into Moravia, while Ziska laid siege to Wisrhade. When the emperor with a fresh accession of forces renewed the attack, he lost his whole army, and the town surrendered to Ziska. He also dispersed an army of crusaders commanded by an archbishop; and in 1422 he again routed the army of Sigismund. In the mean time the Hussites renounced their allegiance to Sigismund, and chose for themselves a king; but this measure was disapproved by Ziska and the Thaborites, because they were inclined to a republican government; and the new king was compelled to abdicate his crown. Such were the reputation and importance which Ziska acquired, that Sigismund proposed to him terms of accommodation; but in his journey to hold a conference with the emperor, he was seized with the plague, which terminated his life in 1524. Although the story of his having ordered his flesh to be given to the birds and beasts, and his skin to cover a drum, for the purpose of founding dismay to his enemies and courage to his friends, be fabulous, it is certain that the Bohemians regarded his memory with superstitious veneration. Un. Hist. Gilpin. Gen. Biog.

ZISPATA, in *Geography*, a bay of the Spanish Main, on the coast of South America; 80 miles S. of Carthagena.

ZISTERSDORF, a town of Austria, with a citadel. In the year 1704, this town was miserably laid waste by the Hungarian rebels; 20 miles N.E. of Vienna. N. lat. 48° 28'. E. long. 16° 43'.

ZITARA, a town of South America, in New Grenada, and capital of a district, to which it gives name, in the province of Chocos; 120 miles S.W. of Santa Fé de Antiquia. N. lat. 6°. W. long. 76° 30'.

ZITHA, or SITHA, in *Ancient Geography*, a town of Asia, in Mesopotamia, on the bank of the Euphrates. Ptolemy.

ZITTAU, in *Geography*, a river of Germany, which runs into the Saal, 4 miles S.S.E. of Bernburg.—Also, a town of Lusatia, on the river Neisse. This town is considered as one of the best in Lusatia, and fortified in the ancient manner; it contains two churches within the walls, and three without, with three hospitals and an orphan-house; 17 miles S. of Gorlitz. N. lat. 50° 49'. E. long. 14° 56'.

ZITWA, a river of Lithuania, which runs into the Niemen, 20 miles S.E. of Lida, in the palatinate of Wilna.

ZIVAGEE, or ARCHACHERA, a town of Hindoostan, in Concan, on the Pirate coast; 30 miles S. of Severndroog.

ZIUF, a town of Africa, in the kingdom of Tunis.

ZIVOLO, in *Ornithology*, a name by which some authors have

have called the smaller species of yellow-hammer, from its conitant note, which is only *zi, zi*.

It is of the size of the common sparrow; its beak is thick and short; its breast and belly yellowish, spotted with brown; and its head, back, wings, and tail, of a dusky-brown, but two of the tail-feathers on each side have a variegation of white.

The difference between the male and female in this species is, that the male is yellow, and has some yellow spots on its neck and sides, which are wanting in the female. It is almost always seen on the ground, and feeds on seeds, &c. It seems but little if at all essentially to differ from the common yellow-hammer; and Mr. Ray has some suspicion that they are the same species.

ZIWICA, in *Geography*, a town of Austrian Poland; 35 miles S.W. of Cracow.

ZIZA, in *Ancient Geography*, a town in the interior of Arabia Petraea. Ptol.

ZIZANIA, in *Botany*, an ancient name, *ζίζανος* of the Greeks, synonymous with the *infelix lolium* of the Latins, as well as with our Darnel, and belonging to an unprofitable weed, of the tribe of Grasses, which greatly injured the crop of corn, and into which Corn itself was supposed to degenerate. (See **LOLIUM**.) Our translators of the New Testament call it Tares! *Aizē* was another Greek name for Darnel, and is still used for *Lolium temulentum* in the Morea. *Zizania* was merely adopted, as an unoccupied classical name, by Gronovius and Linnæus, for the present genus, which yields an inferior sort of grain, used by the inhabitants of some parts of North America. We cannot applaud this application of ancient names, to plants to which they could not possibly have originally belonged, though Linnæus often practised it. Gærtner has successfully opposed this principle, but did not always change things for the better.—Linn. Gen. 491. Schreb. 639. Willd. Sp. Pl. v. 4. 394. Mart. Mill. Dict. v. 4. Pursh 60. Ait. Hort. Kew. v. 5. 278. Juss. 33. Poir. in Lamarck Dict. v. 8. 863. Lamarck Illustr. t. 768. Gærtner. t. 82. (Elymus; Mitchell in Ephem. Nat. Cur. v. 8. append. 210.)—Class and order, *Monocœcia Hexandria*. Nat. Ord. *Gramina*, Linn. Juss.

Gen. Ch. Male, *Cal.* none. *Cor.* Glume of two lanceolate, membranous, ribbed, clasping valves, one rather larger than the other, and most pointed. Nectary of two ovate obtuse scales. *Stam.* Filaments six, capillary, very short, equal; anthers pendulous, linear, notched at each end, shorter than the corolla.

Female in the same panicle, larger, *Cal.* none. *Cor.* Glume of two valves, closed, except a vacancy at each side just above the base; the outer valve largest, concave, long, straight, rigid, revolute at the edges, embracing the inner at each side, and terminating in a long straight awn; the inner narrower, lanceolate, involute at the edges. Nectary of two acute scales. *Stam.* sometimes present, though minute and imperfect, with small incomplete anthers. *Pist.* Germen superior, oblong; styles two, spreading, capillary, short; stigmas feathery, projecting between the valves of the corolla. *Seed* solitary, oblong, even, polished, naked, unconnected with the glumes.

Effl. Ch. Male, Calyx none. Corolla of two valves; the outer one pointed.

Female, Calyx none. Corolla of two unequal closed valves; the outermost largest, revolute at the edges, with a terminal awn. Styles two, divaricated. Seed solitary, enclosed in the plaited corolla, but unconnected with it.

1. *Z. aquatica*. Canadian Wild-Rice. Linn. Sp. Pl. 1408, excluding the synonym of Sloane. Ait. n. 1. Pursh VOL. XXXIX.

n. 1. Lambert Tr. of Linn. Soc. v. 7. 264. t. 13. (*Z. clavulosa*; Michaux Boreal.-Amer. v. 1. 75. Willd. n. 3. *Z. palustris*; Linn. Mant. 295. Willd. n. 4. Schreb. Gram. v. 2. 54. t. 29.)—Panicle pyramidal, compound, with numerous male flowers, in the lower part; spiked and female above.—Common in all the waters, from Canada to Florida, flowering in July and August, and known by the name of *Tyfcarora*, or Wild Rice. *Pursh*. Sir Joseph Banks introduced it into this country in 1790, and still cultivates it abundantly in the ponds of his delightful villa of Spring Grove. The seeds were obtained from Canada in jars of water. Mr. Lambert is of opinion, that this grain might be cultivated in many shallow lakes of Ireland, and turn to considerable advantage. The root is certainly annual; not, as Mr. Pursh marks it, perennial; and consists of numerous, long, stout, hairy fibres. *Stems* several, two or three feet high, round, jointed, hollow, leafy. *Leaves* grassy, long, narrow, smooth, with long, close, striated, smooth sheaths. *Stipula* short, somewhat pointed, membranous, decurrent, entire. *Panicle* two feet, or more, in length, erect, and terminating in a compound, close, straight, spiked cluster, of numerous female flowers; the lower part consisting of still more numerous, drooping male ones, of a smaller size, with green or purplish glumes, and yellow anthers, composing an elegant spreading assemblage, of compound branches. We have from Mr. Frazer a mutilated specimen, of what Michaux and Willdenow call *clavulosa*, a name well expressing the appearance of the female flower-stalks, after the flowers are gone; being larger than in the common specimens. Other writers consider this is not even a variety of the plant in question, and we submit to their opinion. Linnæus, who cultivated the *Z. aquatica* at Upsal, confounded with it originally a Jamaica species, which he afterwards distinguished. But he by inadvertence, in his *Mantissa* above quoted, applies the name of *palustris* to his original *aquatica*, and cites Browne's Jamaica, who has two *Zizania*, neither of which appears to be this North American grass. We shall attempt to set this matter right under the next species.

2. *Z. cfusca*. Jamaica Wild-Rice. (*Z. aquatica*; Linn. Syst. Veg. ed. 13. 714. ed. 14. 855. Willd. n. 1. Z. n. 1; Browne Jam. 340. *Arundo alta gracilis, foliis e viridi cæruleis, locustis minoribus*; Sloane Jam. v. 1. 110. t. 67.)—Panicle loose, much branched. Male and female flowers interperfed.—Common in all the waters, or lagoons, of Jamaica. Sloane calls it the Trumpet reed. The stems are as thick as the little finger, and appear to be several feet high. *Leaves* longer and broader than in the foregoing, with a strong mid-rib. *Panicle* large, with numerous, whorled, repeatedly compound branches, whose ultimate divisions are quite capillary, and very smooth. We have seen but a few damaged flowers. This is unquestionably a very distinct species from the last, though it does not appear that Linnæus ever described it as such. He did not, in fact, distinguish between the names of *aquatica* and *palustris*, but used one at one time, and another at a different period, for the same plant, to which he misapplied Browne's synonym. This has caused great confusion, to remedy which we are obliged to choose a new name, which has some meaning attached to it.

3. *Z. miliacea*. Millet-seeded Wild-Rice. Michaux Boreal.-Amer. v. 1. 74. Willd. n. 2. Pursh n. 2, excluding the references to Willdenow and Sloane.—“Panicle loose, much branched. Male and female flowers interperfed. Glumes with short awns. Seed ovate, smooth.”—In meadows and ditches overflowed by the tide, in Pennsylvania and Carolina, perennial, flowering in August. *Pursh*. The stem

is described as rather thick. *Panicle* long and large, much branched. Permanent *corolla* tumid, and, as well as the *seed*, somewhat ovate, with very short awns. We have seen no specimen of this species, but the ovate tumid *glumes*, with the similar form of the *seed*, which gave occasion to the specific name, appear to constitute a very clear distinction between this and both the preceding, nor is the figure of Sloane, which we have referred to our *essays*, by any means reconcilable to the present plant.

4. *Z. stuitans*. Floating Wild-Rice. Michaux Boreal-Amer. v. 1. 75. Willd. n. 5. Pursh n. 3.—“Spikes foliary, axillary, about four-flowered; the upper ones male. Glumes beardless.”—On the banks of lakes Champlain and St. Laurence; perennial, flowering in July. Of humble stature, with slender, branched, floating *stems*. *Leaves* floating, linear, flat. *Spikes* bristle-shaped; the lower ones female. All the *glumes* are destitute of awns. Michaux, *Pursh*.

5. *Z. terrestris*. Land Wild-Rice. Linn. Sp. Pl. 1408. Willd. n. 5. (Katou-Tsolam; Rheede Hort. Malab. v. 12. t. 60. Raii Hist. Pl. v. 3. 617.)—*Panicle* nearly simple.—Native of sandy ground, on the coast of Malabar. *Stems* round, leafy, jointed. *Leaves* long and narrow, green, rigid, sharply pointed. *Flower-stalks* slender, from the sheaths of the leaves. *Glumes* leafy, bearing round, blackish, glassy buds, (we presume seeds). These bruised with the juice of Betle-nut, and applied to the tongue, are supposed to cure the throat to which children are subject. *Ray*. We have seen no specimen. Linnaeus described this species from the *Hortus Malabaricus* alone, and we presume its genus may, at least, be doubtful.

ZIZDRA, in *Geography*, a town of Russia, in the government of Kaluga; 60 miles S.W. of Kaluga. N. lat. 53° 43'. E. long. 34° 54'.

ZIZERIA, a word used by Apicius, and some other authors, to express the intestines of fowls of the gallinaceous kind, often used in decoctions for glysters, &c.

ZIZERS, or ZITZERS, in *Geography*, a town of the Grisons, in the Cadee league; 6 miles N. of Coire.

ZIZEVON, a town of Persia, in the province of Farsitan; 23 miles E.S.E. of Schiras.

ZIZIPHORA, in *Botany*, a mongrel name, composed, as it is said, of *Zizi*, an Indian word, and *ἴφρα*, to bear; but what is meant by *Zizi*, we are not informed. Morison appears to have received from Aleppo one of the species of this genus, under the name of *Ziziforum*, and Linnaeus, with a slight correction, adopted it.—Linn. Gen. 16. Schreb. 21. Willd. Sp. Pl. v. 1. 123. Vahl Enum. v. 1. 216. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 1. 49. Sm. Prodr. Fl. Græc. Sibth. v. 1. 12. Juss. 111. Poir. in Lamarck Dict. v. 8. 865. Lamarck Illust. t. 18. Gært. t. 66.—Class and order, *Dianthia Monogynia*. Nat. Ord. *Verticillate*, Linn. *Labiate*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, cylindrical, very long, striated, bristly, with five minute marginal teeth, and bearded in the orifice. *Cor.* of one petal, ringent: tube cylindrical, the length of the calyx: limb minute; its upper lip ovate, flat, reflexed, undivided; lower spreading, broadest, in three round equal segments. *Stam.* Filaments two, simple, spreading, about the length of the corolla; anthers oblong, distant. *Pistl.* Germen superior, four-cleft; style bristle-shaped, the length of the corolla; stigma cloven, pointed, inflexed. *Peric.* none, except the calyx remaining unchanged, a little gibbous at the base. *Seeds* four, oblong, obtuse, gibbous at one side, angular at the other, very much shorter than the calyx.

Effl. Ch. *Corolla* ringent; its upper lip reflexed, flat, undivided. *Calyx* thread-shaped. *Seeds* four.

The plants of this genus are slender, generally aromatic herbs, or diminutive shrubs, of humble growth, with the habit of *Thymus*, or *Clinopodium*; but distinguished by their long and slender *calyx*, as well as almost capillary tube of the *corolla*, even more than by having only two *stamens*. Their texture is hard and rigid, and they inhabit dry sunny situations. The *leaves* are opposite and undivided. *Flowers*: whorled or capitate, red or purplish. *Root* mostly annual; sometimes perennial, and rather woody.

1. *Z. capitata*. Oval-leaved Ziziphora. Linn. Sp. Pl. 31. Mant. 317. Willd. n. 1. Vahl n. 1. Ait. n. 1. Sm. Fl. Græc. Sibth. v. 1. 10. t. 13. (Thymus humilis latifolius; Buxb. Cent. 3. 28. t. 51. f. 1. Clinopodium fistulosum pumilum Ind. Occid. summo caule floridum; Fluk. Phyt. t. 164. f. 4.)—Flowers fasciculated, terminal. *Leaves* ovate.—Native of Syria, Tauria, and the isle of Cyprus. A hardy annual, flowering in July and August, sometimes kept in botanic gardens. Miller seems to be the first person who raised this plant in England. The *root* is fibrous, branched and zigzag. *Stem* erect, three or four inches high, when cultivated much taller, square, leafy, usually with two opposite spreading branches, besides the central part, clothed all over with fine, short, curved, hoary pubescence. *Leaves* hardly an inch long, entire, hoary, roughish at the edges, furrowed with parallel veins. *Foot-stalks* one-eighth as long as the leaves. *Braçtes* four at the top of each branch, nearly sessile, like the leaves, but larger, more pointed and fringed; somewhat heart-shaped at the base; about the length of the *flowers*, which are numerous in each head. *Calyx* half an inch long, furrowed, bristly, a little wavy, with slender, sharp, purple teeth. *Corolla* with a white, downy, zigzag tube, and pale purplish limb. *Stamens* prominent, about as long as the lower lip, with bluish anthers. We scarcely perceive any aromatic flavour in the dried plant. Plukenet was much misinformed as to this *Ziziphora* being of West Indian origin.

2. *Z. hispanica*. Spanish Ziziphora. Linn. Syst. Nat. ed. 10. 853. Sp. Pl. 31. Amœn. Acad. v. 4. 263. Willd. n. 2. Vahl n. 2. Ait. n. 2.—Flowers axillary. *Leaves* obovate, pointed, many-ribbed.—Gathered by Lœffing in Spain. *Root* annual. The *stem* is three or four inches high, cross-branched and bushy, downy with minute recurved hairs. *Branches* leafy. *Leaves* a quarter or one-third of an inch long, fringed; tapering at the base; marked on both sides with conspicuous glandular dots: the lower ones smaller, and somewhat crenate. *Flowers* two or three together, sessile. *Calyx* tapering upwards, strongly furrowed, hispid, about the length of the leaves. *Corolla* externally downy. Linnaeus considered the branches as *spikes* and the leaves as *braçtes*, but we can see no more reason for this than in any of the following species. The *leaves* in the original specimen still retain a powerful smell of Pennyroyal.

3. *Z. spicata*. Spiked Ziziphora. “An. Hist. Nat. Madr. v. 4. 254.” Vahl n. 3.—“Flowers in racemose spikes, imbricated. *Braçtes* ovate, acute, ribbed. *Leaves* lanceolate, somewhat toothed.”—Native of Spain. Annual. *Stem* from ten to eighteen inches high, throwing out from the base a branch or two as tall as itself. *Leaves* ribbed; the lower ones stalked; the upper sessile. *Flowers* several, on short stalks, standing near together. *Braçtes* broad, entire, acute, fringed. Perhaps a mere variety of *Z. hispanica*. Yet it seems to differ in having the stem *leaves* lanceolate, narrower than those that accompany the *flowers*, which are ovate, not obovate. Vahl. We have seen no specimen;

specimen; but this description seems to make the inflorescence of the present species really spiked rather than whorled, though it does not alter our opinion as to the lat.

4. *Z. tenuior*. Spear-leaved Ziziphora. Linn. Sp. Pl. 31. Willd. n. 3. Vahl n. 4. Ait. n. 3. (Acinos lyciaca, folio mucronato, capsulis hirsutis; Morif. v. 3. 404. fect. 11. t. 19. f. 3.) also *A. lyciaca*, tenuiore folio, capsulis hirsutis; ibid. f. 4.)—Flowers axillary. Leaves ovato-lanceolate, taper-pointed, acute, entire.—Native of Syria. Sent to Morifon from Aleppo, by the Rev. Dr. Huntington. We presume, from a remark of Morifon under a plant immediately following, that the two varieties here indicated, as well as perhaps a third, with a smoother calyx, his f. 2, were all sent him in feed, and that he raised the plants. If so the introduction of this species should be dated before the time of Miller. The root is annual. Stem a span high, with many square, downy, leafy branches. Leaves an inch long, nearly sessile, strongly ribbed, downy, dotted, entire, more or less fringed with strong white hairs. Flowers stalked, mostly in pairs, altogether axillary. Calyx about half the length of the leaves, hoary with fine recurved pubescence, more or less intermixed with long, prominent, bristly hairs; its lower part swelling much, as the seeds ripen. Corolla pale, hairy externally, with a dilated throat.

5. *Z. acinoides*. Basil-leaved Ziziphora. Linn. Sp. Pl. 31. Willd. n. 4. Vahl n. 5. Ait. n. 4. (Clinopodium supinum incanum; Amm. Ruth. 51.)—Flowers axillary. Calyx hairy. Leaves ovate, stalked, somewhat ferrated.—Native of Siberia. Introduced into England by the late Dr. William Pitscirin, in 1786. Mr. Aiton marks it as perennial. The stems are diffuse, branched, bluntly quadrangular, finely downy. Leaves scarcely aromatic, though dotted with pellucid spots, many-ribbed, rough-edged, and somewhat fringed, from half to three-quarters of an inch long, on footstalks about half or a third as much. Flowers all axillary, three, four, or more, together; on downy stalks, half the length of the footstalks. Calyx cylindrical, strongly ribbed, not downy, but beset with numerous, prominent, horizontal hairs. Corolla hairy, its limb larger than in the first and second species, scarcely so long as the third, of a light purple, or lilac, especially the lip. Anthers large, ovate, purple.

6. *Z. taurica*. Narrow-leaved Ziziphora. Bieberst. Taur.-Caucal. v. 1. 18.—Flowers axillary. Leaves linear-lanceolate, striated, obtuse, entire.—Native of mount Caucasus and its neighbourhood, among lime-stone rocks, or about the stony banks of torrents, flowering in June and July. We received specimens of this, and all the following species, from the Chevalier de Steven. The root is annual, long, tapering and zigzag. Stems one or more, scarcely divided, except at the bottom, ascending, near a span long, not composed of opposite branches crossing each other, as in *Z. tenuior*, to which the author of the Flora Taurico-Caucasica considers this plant very nearly allied. Without adverting to the greater size of the corolla, which is very likely to vary, and to the pubescence of the calyx, which certainly does, the leaves appear to be much narrower and more obtuse; not acute or spinous-pointed. The whole herb smells strongly, but pleasantly, of Penny-royal, and its leaves are dotted as in the *tenuior*. One of our specimens has broader leaves than the other, and rather shakes our opinion of its being a distinct species.

7. *Z. serpyllacea*. Thyme-headed Ziziphora. Bieberst. Taur.-Caucal. v. 1. 18. (Serpyllum orientale, folio pulegii vulgaris; Tourn. Cor. 13.)

β. Bieberst. ibid. (Serpyllum orientale, folio pulegii cervini; Tourn. Cor. 13. Herb. Tourn.)

Clusters terminal, capitate, somewhat leafy. Leaves lanceolate, naked, even, obtuse. Stems rather shrubby, ascending.—Native of the grassy hills of Caucasus, flowering from June to August. β of open fields in Georgia, about Teflis; communicated by the Chevalier de Steven. The stems are rather woody, their branches hoary, with fine, recurved, dense hairs. Leaves smooth, with copious pellucid dots, and the flavour of Penny-royal. They have a mid-rib, but no lateral ribs, veins, or furrows. Flowers stalked, crowded at the summit of each branch into a close tuft, some of the lowermost being axillary. Flower-stalks round, clothed with finest possible hoary pubescence, as are also the strong ribs of the calyx, whose teeth are fringed with long white hairs. Limb of the corolla rather large, and stamens prominent. The variety β, which is all we have seen, is said to differ only in having narrower, perfectly entire, leaves, which are also more crowded than in α. If there be any affinity between the two varieties, neither of them can possibly be the *Z. serpyllacea* of Curt. Mag. t. 906. See the following species.

8. *Z. dafyantha*. Hairy-headed Ziziphora. Bieberst. Taur.-Caucal. v. 1. 18. (Z. serpyllacea; Sims in Curt. Mag. t. 906. Ait. n. 5. Z. Poufchikini; Sims in Curt. Mag. t. 1093. Ait. n. 6.)—Clusters terminal, capitate, somewhat leafy. Calyx densely hairy. Leaves ovate, obtuse, notched. Stems procumbent.—Native of mountainous parts of Georgia, towards Caucasus, flowering from July to September. Introduced into this country by Mr. Lodiges. The root is perennial, and rather woody, as is the lower part of the spreading, nearly prostrate, hairy, purplish stems. Leaves stalked, about a quarter of an inch long, roundish-ovate, ribbed and veiny, distantly ferrated, dotted, roughish with short hairs, especially the ribs beneath. Flowers numerous, crowded into very dense oval heads. Calyx in our specimens quite concealed by very long, dense, spreading, hoary hairs, much more remarkable than in any other known species. Limb of the corolla rather large. Stamens more or less prominent, though variable in length, with large anthers. The colour of the flowers may very well vary between the two extremes represented in the Botanical Magazine. The smell of the herb may also be variable. We cannot but think the original opinion of our judicious friend Dr. Sims far preferable to that which induced him to separate the above two plants. Let it should be wrong however, it is proper to announce that our specimen of *Z. dafyantha*, from the Chevalier de Steven, has little or no scent, and agrees best with *Z. Poufchikini*. The Flora Taurico-Caucasica speaks of a variety, found in the elevated fields of Georgia, in which the leaves are rather narrower, and the hairs of the calyx shorter, as well as fewer. The author esteems this to be closely related to *Z. hispanica*, see n. 2, of which perhaps he had not examined an authentic specimen. No two species of this genus, or any other, can be more distinct, than the Linnæan *hispanica*, and the plant of which we are treating.

ZIZIPHUS, perhaps *Zizipha* of Pliny, though reckoned by him among the kinds of apples; certainly *Ziziphus* of Columella; as well as of Caspar Bauhin and others of the earlier modern botanists; ζίζυς of the modern Greeks. Shaw, in his *Specimen Phytographia Africana*, n. 631, traces this word to the African or Moorish name of the same fruit *Ajajfa*; but its Arabic appellation, *Zizif*, comes much nearer.—Juss. Gen. 380. Tourn. t. 403. Lamarck Dict. v. 3. 316. Illustr. t. 185. Pursh 188.

ZIZIPHUS.

Gærtn. t. 43. (Z. excluding PALIURUS, see that article; Willd. Sp. Pl. v. 1. 1102. Sm. Prodr. Fl. Græc. Sibth. v. 1. 159. Ait. Hort. Kew. v. 2. 18. Rhamnii species; Linn. Gen. 105. Schreb. 142.)—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Dumosa*, Linn. *Rhamnii*, Juff.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, nearly flat, in five fpreading, ovate, equal, coloured, deciduous fegments. *Cor.* Petals five, minute, obovate, between the fegments of the calyx, but much fhorter, oppofite to the ftamens, fpreading horizontally. *Stam.* Filaments five, fhort, lying over the petals, and not half fo long; anthers roundifh, of two lobes. *Pift.* Germen fuperior, orbicular, depreffed; fyle one, very fhort; ftigmas two or three, obtufe. *Peric.* Drupa oval, or roundifh, pulpy, of one cell. *Seed.* Nut folitary, the fhape of the drupa, of one or two cells, with folitary kernels.

Efl. Ch. Calyx flatifh, in five deep fegments. Petals five, oppofite to the ftamens. Drupa fuperior. Nut of one or two cells.

Obf. We have already (fee RHAMNUS and PALIURUS) declared our determination of feparating all thefe genera, though, like Willdenow and fome others, the writer of this has united *Ziziphus* and *Paliurus*, in the *Prodromus Fl. Græc.*; an error which will be corrected in the *Flora Græca* itfelf. With refpect to fome of the fpecies, we can only rely on thofe who have defcribed the fruit, on which the diftinction chiefly depends. They are all frubby, and for the moft part thorny, with alternate, fimple, undivided, deciduous, ftrongly ribbed leaves, and fmall, axillary, tufted, fometimes racemofe and partly terminal, flowers, of a yellow or greenifh colour, and inconfpicuous appearance; their calyx more flat, for the moft part, than that of *Rhamnus*. The fruit is in moft instances eatable, or medicinal. In a few instances, the petals are wanting.

SECT. I. *Thorns or prickles none.*

1. *Z. lineata.* Veiny Jujube. Willd. n. 1. (Rhamnus lineatus; Linn. Sp. Pl. 281. Amœn. Acad. v. 4. 308. Osbeck It. 219. t. 7. Engl. ed. v. 1. 353. t. 7.)—Stem erect, unarmed. Leaves roundifh-ovate, obtufe, wavy. Clusters terminal; their lower flowers axillary.—Gathered by Osbeck, on the French ifland, in the river of Canton, flowering in September. A bufhy fhrub, often as tall as a man, with copious, alternate, round, leafy, finely downy branches. Leaves alternate, on fhort ftalks, of a roundifh, abrupt, often emarginate, figure, half an inch long at moft, fmooth on both fides; dark green above; paler and yellowifh beneath, with very elegant, oblique, parallel, red veins. Flowers about the ends of the branches, ftalked, partly axillary, partly collected into terminal fmooth clufters. Calyx a little concave, or bell-fhaped, at the bafe; its fegments lanceolate, as are likewife the petals. Anthers black before they burft. Drupa fmall, oval, feated on the orbicular permanent bafe of the calyx.

2. *Z. volubilis.* Twining Jujube. Willd. n. 2. Ait. n. 1. Purfh n. 1. (Rhamnus volubilis; Linn. Suppl. 152. Walt. Carol. 101. Jacq. Coll. v. 2. 236. Ic. Rar. t. 336.)—Stem twining, unarmed. Leaves ovate, acute, fometimes wavy. Umbels axillary and terminal, ftalked.—In deep fwamps, near the fea-coaft, from Virginia to Carolina, flowering in June. Flowers fmall, greenifh-yellow. Fruit oblong, violet-coloured. It afcends the higheft trees of *Cupreffus difticha*, in the Dimal fwamp, near Suffolk in Virginia, and is known there by the name of Supple-Jack. Purfb. The branches are round and fmooth. Leaves ftalked, drooping, one and a half or two inches long, and

near one broad, acute, and tipped with a fmall point, fmooth, with oblique parallel veins, more numerous than in the laft; their under fide rather the paleft. Flowers fmall, pale. Drupa fmall, blackifh, of a long oval fhape. Nut of two cells in the wild ftate, according to Walter, though Jacquin, in the cultivated plant, found only one. Lamarck, in an obfervation at the end of this genus, though he allows this fpecies to have the proper fruit of *Ziziphus*, gives his reasons for keeping it in *Rhamnus*; thefe are the concave calyx, and the want of a fleyh difk, or, in Linnæan language, “receptacle of the flower.” Probably the fame remarks would apply to the preceding fpecies, which Lamarck alfo excludes from *Ziziphus*. We are ready to allow that they both have more of the habit and foliage of *Rhamnus*, and their fruits are fo fmall, it may be difficult to fay whether they are drupas or berries. Not having had an opportunity of investigating this point ourfelves, we muft rely on thofe who have.

3. *Z. peruviana.* Peruvian Jujube. Lamarck n. 12.—Stem unarmed. Leaves elliptic-obovate, fparingly and minutely toothed, fomewhat angular, rather fleyh, fmooth. Petals acute, longer than the calyx.—Native of Peru. Long cultivated in the public garden at Paris, from whence the younger Linnæus procured a fpecimen, and where Lamarck faw it flowering for many fucceffive years, but without producing fruit, which led him to fuppofe the flowers might be dioecious. The plant itfelf appears now to be no longer in exiftence there, no mention being made of it in profeflor Desfontaines’s Tableau de l’Ecole de Botanique au Jardin du Roi, ed. 2. printed in 1815. This is an evergreen, branching, loofely fpreading fhrub, about three feet high, fmooth in every part. Branches a little zigzag, nearly round. Leaves fcattered, ftalked, from an inch to an inch and a half long, generally obovate, blunt, or fometimes pointed, thick and fomewhat fleyh, of a glaucous green, with a mid-rib, and a few fcattered veins, none of which feem to be vifible but in a dried ftate, and then but flightly. The margin is irregularly angular, each angle tipped with a glandular tooth. Our fpecimen has no flowers. Lamarck fays they are fmall, axillary, two or three together, or folitary, ftalked, yellowifh-white, widely expanded, five-cleft. Petals oval, pointed, flat, larger than the calyx.

4. *Z. emarginata.* Notched Jujube. Swartz Ind. Occ. 1954.—Stem erect, unarmed. Leaves roundifh-ovate, emarginate. Umbels axillary, ftalked. Petals none.—Gathered by Mr. Fahlberg, in the Weft Indian ifland of St. Bartholomew. The ftem is fhrubby, with round, erect, rigid branches, whole bark is grey and fmooth; their extremities angular. Leaves ftalked, alternate, but approaching each other in pairs, fo as to become nearly oppofite, rather membranous, very fmooth on both fides, an inch or an inch and a half long, entire, the extremity only being flightly emarginate. Footftalks fhort. Umbels oppofite. Stalks the length of the footftalks, thickened as the fruit advances. Partial ones from three to fix, rather longer, fingle-flowered. Calyx concave, with a fpreading limb, in five acute fegments, divided as it were into two cavities. Petals none. Filaments very fhort, inferted below the divifions of the calyx. Anthers ovate, embraced at each fide by the hollows in the fegments of the calyx. Stigmas two, obtufe. Drupa roundifh-ovate, fmooth, the fize of Allfpice, crowned with the permanent fyle. Nut of two cells, with folitary kernels. Swartz.

SECT. 2. *Branches prickly.*

5. *Z. Lotus.* Lotus Jujube. Willd. n. 4. Lamarck n. 2. Ait. n. 3. (*Z. fylvestris*; Tourn. Inf. 627. Shaw Afric.

ZIZIPHUS.

Afric. n. 632. f. 632. *Rhamnus Lotus*; Linn. Sp. Pl. 281. "Desfont. in Act. Paris, for 1788. 446. t. 21. Mungo Park's Travels, 99, with a plate."—Prickles in pairs; one of them hooked. Leaves elliptic-oblong, slightly crenate, three-ribbed, smooth on both sides.—Native of Africa, especially of the kingdom of Tunis, "in a tract called *Jereed*, which was formerly the country of the *Lotophagi*. The Arabs know this plant by the name of *Sedra*. It has the habit of a *Rhamnus*, and the flowers of the Common Jujube. But the fruit is smaller, rounder, and sweeter; the size of Sloes, with a large stone. This fruit is borne on every part of the branches, like Gooseberries; whereas that of the Common Jujube grows only on the slender annual shoots, thrown out from the ends of the branches. The *Z. vulgaris* is 20 feet, or more, in height, with a large furrowed stem, twisted branches, knotty at the extremities, and larger oblong leaves; but the *Lotus* is scarcely three or four cubits high, with numerous shoots from the same root, which are smoother, straighter, and paler, or whitish; the leaves small, round, and more rigid. The fruit is ripe, and is fit for eating, in December and January." Such is Dr. Shaw's very intelligent account; to which we may add, that the prickles grow in pairs, both of them very straight, slender, and sharp, when young, but in process of time one becomes thick and hooked, the other much elongated, remaining quite straight. The leaves are at most an inch long, perfectly smooth, naked; and green, on both sides; their three ribs sometimes separate, sometimes more or less combined.

6. *Z. Napeca*. Smooth Indian Jujube. Willd. n. 5. Lamarck n. 11. (*Rhamnus Napeca*; Linn. Sp. Pl. 282. Rh. n. 87; Linn. Fl. Zeyl. 36. *Jujuba indica spinosa*, folio et fructu longiori; Pluk. Almag. 199. *Prunus zeylanica spinosa*, &c.; Pluk. Phyt. t. 216. f. 6. *Vidara littorea*; Rumph. Ambon. v. 2. 119. t. 37.)—Prickles generally in pairs, hooked. Corymbs axillary, many-flowered. Leaves ovate, acute, finely serrated, smooth on both sides. Fruit elliptical.—Native of Ceylon, Amboyna, and other islands of the East Indies. We know this only by the specimen in the Linnæan herbarium, which does not quite agree with the description in the *Flora Zeylanica*, the leaves being neither oblique, unequal, nor bluntish, but exactly as represented by Plukenet and Rumphius. The branches are somewhat zigzag, round, or a little angular, with a smooth whitish bark; rough with mealy down when young, like the flower-buds, stalks, and young leaves. Prickles stout, recurved, dark brown. Leaves an inch, or an inch and a half long, elliptic-ovate, acute, tipped with a small glandular point, finely and bluntly serrated, strongly three-ribbed; paler and yellowish beneath. Footstalks quarter of an inch long, a little downy. Flowers very numerous, in dense, compound, downy or mealy, corymbose clusters, on short axillary stalks. *Drupa* like an olive, elliptical, or somewhat ovate; its flavour acid and astringent. Rumphius says, this fruit is seldom eaten but with salt, or as a sauce to fish or other food, for the purpose of exciting an appetite. Lamarck unites this species, or at least its synonyms, with the *Rhamnus Spina-Christi* of Linnæus, of which we shall speak hereafter; see n. 15.

7. *Z. Jujuba*. White-leaved Indian Jujube. Willd. n. 6. Lamarck n. 6. Ait. n. 4. (*Rhamnus Jujuba*; Linn. Sp. Pl. 282. Rh. n. 89; Linn. Fl. Zeyl. 36. *Manifanas*; Sonnerat Nouv. Guin. 134. t. 94. *Malum indicum*; Rumph. Ambon. v. 2. 117. t. 36. *Perintoddali*; Rheede Hort. Malab. v. 4. 85. t. 41.)—Prickles solitary, deflexed. Corymbs axillary, many-flowered.—Leaves roundish-ovate, obtuse; downy and snow-white

beneath.—Native of the East Indies. A flowe plant in England, flowering in April and May. When wild, it makes a tree of a moderate size. The branches, flower-buds, stalks, and backs of the leaves, are all white with fine, dense, entangled, rather itarry, pubescence. Form and size of the leaves much like the last, but rather rounder and more blunt; the margin crenate, or bluntly serrated; upper side very smooth, of a fine green. Inflorescence like the last. Flowers white; sometimes six-cleft and hexandrous. Style divided. *Drupa* globular, or somewhat heart-shaped. Nut rugged, with two green kernels. Sonnerat reckons this fruit among the best that are the produce of New Guinea. Rheede speaks of it as "agreeably acid," and more olive-shaped than in Sonnerat's figure. Cultivation perhaps may account for these differences. Hence we presume *Z. mauritiana*, Lamarck n. 7, may be but a variety of this.

8. *Z. Xylopyrus*. Wooden-fruited Indian Jujube. Willd. n. 7.—"Prickles solitary, recurved. Leaves ovate, rather acute, somewhat heart-shaped; downy beneath. Flowers corymbose."—Native of desert places, at the bottoms of hills in the East Indies. A tree, scarcely taller than a man. Branches hoary. Leaves broadly-ovate, often in some degree heart-shaped, not frequently oblique; unequally serrated; dark coloured above; clothed beneath with very fine white down. Prickles few, small, solitary under each footstalk. Flowers in axillary stalked corymbs. Calyx downy. *Drupa* dry, insipid, slightly astringent, larger than a cherry. Nut rugged. Retzius, Willd. Possibly this may be *Z. rugosa*; Lamarck n. 8, for which that author cites *Frutex bijagaricus spinosus*, &c.; Pluk. Phyt. t. 29. f. 7.

9. *Z. Oenoplia*. Velvet-leaved Jujube. Willd. n. 8. Lamarck n. 5. Mill. Dict. ed. 8. n. 3. (*Rhamnus Oenoplia*; Linn. Sp. Pl. 282. Rh. n. 88; Linn. Fl. Zeyl. 36. *Jujuba aculeata, nervosis foliis, infra sericeis, flavis*; Burm. Zeyl. 131. t. 61.)—Prickles solitary, conical, recurved. Leaves unequally ovate, or half-heart-shaped, acute; silky beneath.—Native of Ceylon. A small tree, with downy branches, and short, thick, hooked prickles. Leaves two inches long, very obscurely serrated; remarkably uneven or oblique at the base, the three ribs also being much nearer one margin than the other; the under side finely silky and yellowish; the upper also silky while young, but in a less degree. Flowers in little dense, silky, axillary tufts.

10. *Z. iguanea*. Lizard Jujube. Lamarck n. 4. (*Rhamnus iguaneus*; Linn. Sp. Pl. 282. Jacq. Amer. 74. *Jujube americana spinosa, loti arboris foliis et facie, fructu rotundo parvo dulci*; Commel. Hort. v. 1. 141. t. 73.)—Prickles in pairs, unequal, divaricated. Leaves ovate, pointed, serrated, smooth on both sides. Clusters axillary, monoecious. Petals wanting. Fruit roundish.—Native of the West Indies, as well as of the neighbouring continent, in bushy, rocky, or stony places, where the *Lacerta Iguanea*, reported to be fond of this fruit, is likewise frequently to be met with. This is an inelegant trailing shrub, with round, zigzag, scarcely downy, branches. Leaves thin, plant, three-ribbed, very smooth, two or three inches long, sometimes more, Jacquin says eight inches, though rarely, in which case they are more elliptical. The prickles are long and slender, in pairs under each footstalk; one of them always straight; the shortest sometimes curved, but not remarkably. Flowers small, yellow, according to Jacquin destitute of petals. *Drupa* roundish or ovate, yellow, twice the size of a pea, with a sweet pulp, and a rugged nut, of one cell. Willdenow seems to have omitted this species entirely.

11. *Z. sinensis*. Chinese Jujube. Lamarck n. 3. Defont. Tabl. 231.—“Young branches prickly, downy; old ones unarmed. Leaves ovate-oblong, sharply serrated. Petals reflexed under the calyx.”—Cultivated in the public garden at Paris, and said to be a native of China. As this point is uncertain, how much better might the name of *cryptopetalata* have been chosen! Lamarck describes the present species as a *shrub*, only three or four feet high, losing its slender, unequal, brittle-like prickles as the branches advance in age. Leaves of a very pale green, crowded, three-ribbed, rather smaller than those of *Z. vulgaris* hereafter described; we presume they are quite smooth. *Footstalks* short and downy. *Flowers* small, whitish, axillary, solitary or in pairs, remarkable for having their *petals* so completely reflexed, and concealed by the *calyx*, as not to be visible when we regard the flower vertically. Lamarck.

12. *Z. rotundifolia*. Round-leaved Jujube. Lamarck n. 9. (Jujuba, five *Ziziphus*, zeylanica rotundifolia crenata minor, foliis subtus lanuginosis; Pluk. Phyt. t. 197. f. 2. Burm. Zeyl. 132.)—“Prickles in pairs; one of them recurved. Leaves roundish-oval; downy beneath.”—Native of Ceylon. Leaves small, perhaps hardly an inch long, rather more rounded than in Plukenet’s figure, slightly toothed; smooth above; cottony beneath; on very short *footstalks*. Branches slender, cylindrical. Prickles small. An Indian specimen in the Linnean herbarium, attached to *Z. Napaea*, to which it certainly is very little related, agrees in many points with this description of Lamarck, except that the very small prickles are solitary, nor are the *footstalks* very short. We know not to what other species of *Ziziphus* to refer this specimen. It is marked *Ber*, and said to afford gum lac, which is collected from it by winged insects.

13. *Z. angulata*. Angular-branched Jujube. Lamarck n. 10.—“Prickles in pairs, straight. Leaves roundish-oval, somewhat toothed, smooth on both sides. Branches acutely angular.”—Described from the herbarium of Jussieu, without fructification. The angular branches strikingly distinguish this species from all the rest. They are woody, smooth, zigzag, square, with prominent acute angles. Leaves three-ribbed, an inch and a half broad, on short *footstalks*. Lamarck. Nothing is recorded of the native country of this plant.

14. *Z. vulgaris*. Common Jujube. Willd. n. 9. Lamarck n. 1. Ait. n. 5. Sm. Fl. Græc. Sibth. t. 241. (Z.; 5. Dod. Pempt. 807. *Zizypha*; Camer. Epit. 167. *Rhamnus Zizyphus*; Linn. Sp. Pl. 282. Pall. Ross. v. 1. part 2. 24. t. 59. C. L. Willich Obf. 5. Jujube Arabum, five *Ziziphus* Dodonæi; Ger. Em. 1501.)—Prickles in pairs, unequal. Leaves ovate, abrupt, bluntly serrated, smooth. Flowers in axillary tufts. Fruit elliptical.—Native of the south of Europe. Gathered by Dr. Sibthorp about Megara, and on mount Parnassus. It has been cultivated in England ever since Parkinson’s days, but requires the shelter of a green-house, and though it may sometimes blossom, never bears fruit. Pliny says the Jujube-tree was brought, in his time, from Syria into Italy. When wild it attains the size of a small tree, with round, smooth, glaucous branches, zigzag and leafy when young. The prickles make no appearance on the young leafy shoots, but the following year they become strong thorns, one of them an inch long, the other much shorter, and sometimes, not always, recurved, as Willich well observes. Leaves rather crowded, deciduous, on short stalks, ovate, somewhat tapering into a broad blunt point, frequently emarginate; their edges copiously though bluntly serrated; both surfaces smooth; the under paler, strongly three-ribbed; their length an inch

and a quarter or an inch and a half. Flowers yellowish, on short stalks, in little axillary tufts, not much longer than the *footstalks*. Petals obtuse, half the length of the *calyx*. Stigmas two or three. *Drupa* the size and shape of an olive, blood-red, sweet, mucilaginous, esteemed good in forensics or inflammation of the mouth and throat, but are out of use in our present practice. If Pallas’s plate above quoted be the true *Z. vulgaris*, of which we cannot help feeling some doubt, a comparison of that plate with the old wooden cut of Camerarius, may serve to shew how superior the artists of those earlier times were to some of our modern delineators and colourers.

15. *Z. Spina Christi*. Christ’s-thorn Jujube. Willd. n. 10. (Z. africana; Mill. Diæt. ed. 8. n. 4. *Rhamnus Spina Christi*; Linn. Sp. Pl. 282. *Oenoplia spinosa*; Cluf. Hist. v. 2. 313. Nabca, *Palurus Athenæi credita*; Alpin *Ægypt*. 16. t. 19. Jujube five *Zizyphus africana*, mucronatis foliis, spinâ gemellâ; Pluk. Almag. 199. Phyt. t. 197. f. 3.)—Prickles in pairs, straight. *Corymbs* axillary, stalked, many-flowered. Leaves ovate, finely crenate, smooth on both sides. Fruit globose.—Native of Ethiopia and Palestine. Seeds collected near Jerusalem, by Hasselquist, produced the plant described by Linnaeus, a wild specimen of which, sent also by Hasselquist, is preserved in the Linnean herbarium. Miller also raised this species from Syrian seeds, so that it is entitled to a place in Hort. Kew. Respecting Plukenet’s synonym, we feel no doubt. The cut of Alpinus as much resembles *Z. Napaea*, n. 6, in the foliage, but the globose fruit agrees best with the species before us. The prickles are hardly visible on our specimen, which is a young luxuriant leafy branch, in flower. They perhaps acquire their full proportion on older branches, as in *Z. vulgaris*, n. 14. The leaves are scattered, of a broad-ovate, somewhat roundish, obtuse figure, two and a half or three inches long, and two wide, strongly three-ribbed, with transverse veins, minutely and slightly crenate rather than serrated, very smooth and even on both sides; paler beneath. *Footstalks* scarcely an inch long; downy on their upper side. *Corymbs* forked, downy, many-flowered, each on a solitary axillary stalk, shorter than the *footstalk*. Bractæes awl-shaped. In our only expanded flower, the segments of the *calyx*, as well as the *petals* and *stamens*, are strongly reflexed, quite under the base of the *calyx*. The *drupa* is said to be the size and shape of a Sloe.

ZIZITH, in the *Jewish Customs*, a name given by the Jews to the tufts or fringes they used anciently to wear at the four quarters of their upper garments, but which they now only wear under their clothes, fixed to a square piece of cloth, which represents the garment they anciently wore in their own country before their dispersion. The zizith of the modern Jews is a tuft made of eight threads of yarn, spun on purpose for this use, each having five knots, which take up half the length. That which is not knotted, being furled out, makes a kind of tuft or fringe. Numb. xv. 38. Deuter. xxii. 12. Leo of Modena, Cerem. of the Jews, part 1. chap. 5. Calmet. Diæt. Bibl. in voc.

ZIZYPHA, in Botany. See ZIZIPHUS.

ZLABINGS, in Geography, a town of Moravia, in the circle of Iglau; 28 miles W. of Znaym.

ZLATOUSTOVSKOI, a town of Russia, in the government of Upha; 60 miles W. of Tcheljabinsk.

ZLEBY, a town of Bohemia, in the circle of Czafslau; 4 miles S.E. of Czafslau.

ZLIN, a town of Moravia, in the circle of Hradisch; 15 miles N.N.E. of Hradisch.

ZLOTI, a money of account in Poland, where accounts are kept in zloti, guldens, or florins of 30 groschen or grosz,

grofz, and each grofchen is divided into 18 pfenings. The florin also contains $2\frac{1}{2}$ fchilling, 90 pfenings, or 270 pfenings. A fchilling is worth 12 grofchen, or 36 pfenings; a grofchen, 3 fchillings; and a pfenning, 3 pfenings.

ZMEINOGORSKAIA, in *Geography*, a fort of Ruffia, on the river Porobalika; 200 miles S. of Kolivan. N. lat. $51^{\circ} 10'$. E. long. $82^{\circ} 10'$.

ZMLACES, in *Natural History*, a name given by Pliny to a fone found in the river Euphrates, refembling marble, and of a blueifh-green colour.

ZMLAMPIS, the name of a gem, defcribed by Pliny and the ancients, which they tell us was very like the Proconnefian marble, except that in the centre of the fone there was always a blueifh fpot, refembling the pupil of an eye.

The Proconnefian marble of the ancients was of a fine clear and elegant white, variegated with irregular black veins. Pliny's defcription is fo fhort, that it has been fuppofed from him that the zmlampis was a fort of marble; he only fays of it, that it was like the Proconnefian marble, but blue in the middle. Many had inferred from this, that he meant no more by it than that this was a fone, which had blue veins inftead of the black ones in the Proconnefian kind. But when we examine the ref of the ancients, and find that it was a fmall fone, found in the river Euphrates, and worn in rings, and that its blue fpot was like a pupil of an eye, we may eafily determine that it was one of thofe gems which we call *oculus belli*, or *bellocchio*; of which there is a vaft variety found in the rivers of the Eaft Indies, and many have a fine opaque white ground, and a blueifh or greenifh fpot for the pupil.

ZMLANTHES, a name given by Solinus and fome others to a gem called by the more correct writers *zmlampis*.

ZNAMENSKOI, in *Geography*, a town of Ruffia, in the government of Tobolsk, on the Irtifch; 28 miles N.N.W. of Tara.

ZNAYM, a town of Moravia, in the circle of the fame name, near the river Teya. This town was built about the year 1222, at a little diftance from another town, laid wafte by the Bohemians. It contains a citadel, four cloifters, and a college; the circle borders on Auftria; 68 miles S.W. of Olmutz. N. lat. $48^{\circ} 48'$. E. long. $15^{\circ} 51'$.

ZNENDEI, a river of Ruffia, which runs into the Vitim. N. lat. 53° . E. long. $115^{\circ} 14'$.

ZNIN, a town of the duchy of Warfaw; 20 miles N. of Gnefna.

ZNONIGRAD, a town of Croatia; 36 miles S. of Bihaas.

ZOAGLI, a town of Genoa; 20 miles E. of Genoa.

ZOANA, in *Ancient Geography*, a town of Afa, in the Leffer Armenia, upon the route from Satala to Arabiffus, between Tonofa and Gundufa. Anton. Itin.

ZOANNES, a name given by Strabo to a people half-favage, that inhabited the mountains of the Colchide.

ZOAR, **ZOARA**, *Segor*, or *Bela*, a city of Pentapolis, on the fouthern extremity of the Dead fea. It was preferved by deftruction from fire by means of the interceffion of Lot. (Gen. xiv. 2.) Its name before this circumftance was Bela; but when Lot requested it to be fpared as a place of refuge for himfelf, he represented it as a *fmail* place; and hence it had the name *Zoar*, or *Segor*, which, in Hebrew, fignifies fmail or little. The Romans kept a garrifon at Zoar. St. Jerom obferves, that the name Bela was given to this city, becaufe, as foon as Lot left it, an earthquake caufed it to be fwallowed up; *bela* in Hebrew

fignifying to fwallow up. Jerom alfo fays, that the Hebrews think that Zoar bears alfo the name of Shalifa. (1 Sam. ix. 4.) They pretend that this city has been often demolifhed by earthquakes.

ZOAR, in *Geography*, a town of Arabia, in the province of Hedfias, on the fouth coaft of the Dead fea, at the mouth of the Safa; 30 miles N. of Karac.

ZOAR. See **TSOR**.

ZOARA, a town of Africa, in the country of Tripoli; 60 miles W.N.W. of Tripoli.—Alfo, a town of Africa, in the country of Barca; 140 miles S.W. of Tolometa. N. lat. $32^{\circ} 35'$. E. long. $11^{\circ} 56'$.

ZOBAYA, a town of Mexico, in the province of Guatimala; 30 miles N. of Guatimala.

ZOBEIR, a town of the Perfian empire, in the pachalic of Bagdad, about 10 miles W. of the city of Baffora, fituated on the dry canal of the Djurre Zade, fuppofed to be the former bed of the Euphrates. It is by fome faid to be the ancient Bafra, and derives its prefent name from Zobeir, who was defeated and flain in the battle of the Camel, fought near this place.

ZOBELN, a town of the duchy of Courland; 20 miles E. of Goldingen.

ZOBERA, a town of Arabia, in the province of Yemen; 35 miles S.E. of Chamir.

ZOBERN, a town of Saxony, in the Vogtland; 8 miles W. of Oelfnitz.

ZOBIN, a town of Germany, in the principality of Ottingen Wallerftein; 6 miles W.N.W. of Nordlingen.

ZOBING, a town of Saxony, in the margravate of Meiffen; 15 miles S. of Defau.—Alfo, a town of Auftria; 3 miles N. of Crems.

ZOBLITZ, a town of Saxony, in the circle of Erzgebirg. This place confifts of 110 houfes, and the inhabitants fubfift principally by working the ferpent-ftone, which is found here, into pitchers, bowls, tea and coffee difhes, mortars, cups, &c. The ferpent-ftone is dug juft above the town, and farther on to the eaft of it is found a red fpecies, which is reckoned among the fineft, and for that reafon is alfo confidered by the fovereign as his property, together with a yellow, green, grey, and black fort. In the electoral red quarry is alfo found afbestos of divers colours and granites; 17 miles S. of Freyberg. N. lat. $50^{\circ} 36'$. E. long. $13^{\circ} 11'$.

ZOBOWITZ, a town of Pomerelia; 14 miles S. of Dantzic.

ZOBTEN, a town of Silefia, in the principality of Schweidnitz; 9 miles E.N.E. of Schweidnitz. N. lat. $50^{\circ} 48'$. E. long. $16^{\circ} 41'$.

ZOBTENBERG, a mountain of Silefia, fituated in a country otherwife level, 2424 Paris feet above the level of the fea, near Zobten.

ZOCCO, **ZOCCOLO**, *Zocle*, or *Socle*, in *Architettura*. See **SOCLE**.

ZOCELAR, in *Geography*, a town of Croatia; 2 miles S.W. of Bihaas.

ZOCHINACAZTLIS, in *Botany*, a name by which fome authors have called the *flos auricula*, a flower of New Spain, ufed in making of the Spanifh chocolate.

ZODIAC, **ZODIACUS**, in *Aftronomy*, a fascia, or broad circle, whofe middle is the ecliptic, and its extremes two circles parallel to it, at fuch diftance from it, as to bound, or comprehend, the excursions of the fun and planets.

The word is formed from the Greek ζῶον, *animal*, by reafon of the conftellations in it, which have the forms of animals given them; others derive it from ζῶν, *life*, from

an opinion, that the planets have a great influence on animal life.

The sun never deviates from the middle of the zodiac; *i. e.* from the ecliptic: the planets all do more or less. Their greatest deviations, called latitudes, are the measure of the breadth of the zodiac; which is broader, or narrower, as the greatest latitude of the planets is made more or less. Accordingly some make it 16, some 18, and some 20 degrees broad.

The zodiac intersecting the equator obliquely makes an angle with it of 23 degrees and a half; or, more precisely, of 23° 29', which is what we call the *obliquity of the zodiac*, and is the sun's greatest declination. See ECLIPTIC.

The zodiac is divided into twelve portions, called *signs*; and those divisions, or signs, are denominated from the constellations which anciently possessed each part. But the zodiac being immoveable, and the stars having a motion from west to east, those constellations now no longer correspond to their proper signs; whence arises what we call the *precession of the equinoxes*.

When a star, therefore, is said to be in such a *sign of the zodiac*, it is not to be understood of that sign, or constellation, of the firmament, but only of that twelfth part of the zodiac, or dodecatemery of it.

Cassini has also observed a tract in the heavens, within whose bounds most of the comets, though not all of them, are

observed to keep, which, for this reason, he calls the *zodiac of the comets*.

This he makes as broad as the other zodiac, and marks it with signs, or constellations, like that; as Antinous, Pegasus, Andromeda, Taurus, Orion, the Lesser Dog, Hydra, the Centaur, Scorpio, and Sagittary.

ZODIAC, Hindoo. The early investigators of Hindoo mythology, which comprehends not only their astronomy, but every science, and almost every art, of which the Hindoos have any knowledge, were surprised to find that the days of the week were named, as with us, after the planets, and in the same order. It was natural enough to suppose that the Hindoo almanac was borrowed from the Arabians. The few Brahmans who at that time had access to Europeans of science, supposed the fame of us, when they discovered the similitude of fable and of name. But it has been made manifest by the investigations of later writers, that the Hindoo zodiac is of very great antiquity. Such of our readers as may be desirous of extended information hereon, are referred to the dissertations of sir William Jones and Mr. Colebrooke; on the Hindoo zodiac, in the 2d and 9th volumes of the Asiatic Researches; and to the Hindoo Pantheon. In both works, plates of the Hindoo zodiac are given from different authorities; and in the latter work separate engravings also of the personified planets. We will extract from it a sort of table, shewing the English and Sanskrit names, and the vehicles assigned to the several planets by the latter fabulists.

Names of Planets, &c.		Days over which they respectively preside.		Vehicles or Seats, according to the Plate of	
English.	Sanskrit.	English.	Sanskrit.	Sir William Jones.	The Hindoo Pantheon.
Sun	Surya	Sunday	Aditvar	Lion	Chariot
Moon	Soma	Monday	Somavar	Antelope	Antelope
Mars	Mangala	Tuesday	Mangalvar	Horse	Ram
Mercury	Boodh	Wednesday	Budhvar	Eagle	Carpet
Jupiter	Vrihaspati	Thursday	Vrihaspatvar	Boar	Do.
Venus	Sukra	Friday	Sukervar	Camel	Rat
Saturn	Sani	Saturday	Saniyar	Elephant	Raven
Dragon's Head	Ketu			Frog	Carpet
Dragon's Tail	Rahu			Tortoise	Owl

Under the Sanskrit names of the planets we have given short articles descriptive of their mythological and historical attributes and allusions. To them (SURYA, SOMA, &c.) we therefore refer for farther particulars, and to the article VAHAN for an account of the vehicles assigned to them and other mythological personages of Hindoo fable.

ZODIACAL LIGHT, a brightness resembling that of the milky way, but less bright, and which is sometimes perceived in the heavens, at certain times of the year, after sun-set, or before its rise. Some have supposed, that this phenomenon is the same with that which the ancients called *trabes*, a term by which they denoted a meteor, or impression in the air like a beam. Thus Pliny (lib. ii.) says, "emittant trabes, quos docos vocant." The form of this light resembles that of a pyramid, lying lengthways in the zodiac, within which its point and axis are always enclosed, its base being towards the sun, and placed obliquely with respect to the horizon. In the torrid zone, the zodiacal light is frequently, or almost constantly, seen. At or near our latitude it may be seen about the time of the equinoxes. The best time for seeing it is about the 1st of March, at 7 o'clock in the

evening, when the twilight is ending, and the equinoctial point in the horizon. This phenomenon was first discovered by Descartes, and by Childrey about the year 1659. It did not engage general attention till it was described and named by M. Cassini the elder, in 1683. It was afterwards observed by M. Fatio, in 1684, 1685, and 1686, and by M. Kirch and Eimmart, in 1688, 1689, 1691, 1693, and 1694. See Mairan, Suite des Mem. de l'Acad. Royale des Sciences, 1731, p. 3.

In 1707, April 3, it was observed by Mr. Derham in Essex. It appeared in the western part of the heavens, about a quarter of an hour after sun-set, in the form of a pyramid, perpendicular to the horizon. The base of this pyramid he judged to be the sun. Its vertex reached 15° or 20° above the horizon. It was throughout of a dusky-red colour, and at first appeared pretty vivid and strong, but faintest at the top. It grew fainter by degrees, and vanished about an hour after sun-set. This solar atmosphere has also been seen about the sun in a total solar eclipse, a luminous ring appearing about the moon at the time when the eclipse was total.

M. Fatio conjectured that this appearance arises from a collection of corpuscles encompassing the sun in the form of a lens, reflecting the light of the sun. M. Cassini supposed that it might arise from an infinite number of planets revolving about the sun; so that this light might owe its existence to these bodies, as the milky way does to an innumerable number of fixed stars. It is now, however, generally supposed, that it is matter detached from the sun by its rotation about its axis. The velocity of the equatorial parts of the sun being the greatest would throw the matter to the greatest distance, and on account of the diminution of velocity towards its poles, the height to which the matter would there rise would be diminished; and as it would probably spread a little sideways, it would form an atmosphere about the sun something in the form of a lens, whose section perpendicular to its axis would coincide with the sun's equator. And this agrees very well with observation. There is, however, a difficulty in thus accounting for this phenomenon. It is very well known that the centrifugal force of a point of the sun's equator is a great many times less than its gravity. It does not appear, therefore, how the sun, from its rotation, can detach any of its gross particles. If they be particles detached from the sun, they must be sent off by some other unknown force; and in that case they might be sent off equally in all directions, which would not agree with the observed figure. The cause is probably owing to the sun's rotation, although not immediately to the centrifugal force arising therefrom.

The zodiacal light, according to M. de Mairan's ingenious and plausible hypothesis, is nothing but the solar atmosphere, a rare and subtle fluid, either luminous by itself, or made so by the rays of the sun surrounding its globe; but in a greater quantity, and more extensively about its equator than any other part. As it always accompanies the sun, it is natural to ascribe it to a solar atmosphere, extending beyond the orbit of Mercury, and sometimes even beyond that of Venus. Accordingly, the zodiacal light has been supposed to be a section of this atmosphere, which, being extremely flat at its poles, cannot be conceived to partake of the sun's monthly motion. Dr. T. Young (Lectures, vol. i. p. 502.) observes, that the only probable manner in which it can be supposed to retain its figure, is by means of a revolution much more rapid than that of the sun's motion. To that purpose, M. de la Lande remarks, that it seems now to be generally believed, that the zodiacal light is the atmosphere of the sun; for it always accompanies that luminary; and the equator of the sun is in the direction of this light: consequently he says, that in all probability the zodiacal light is an atmosphere situated round the sun, in the direction of its equator, and flattened by its rotatory motion. Astron. Paris, 1771. § 845 to 849.

The zodiacal light is more or less visible according to circumstances; but the solar atmosphere is not always visible by means of this light, though it be always seen about the globe of the sun in total eclipses.

One of the most essential circumstances for the perception of the solar atmosphere by the zodiacal light is its having sufficient length on the zodiac; for without this its brightness is entirely hid from us by the twilight.

M. de Mairan says, it may be proved from many observations, that the sun's atmosphere sometimes reaches as far as the earth's orbit, and there meeting with our atmosphere produces the appearance of an aurora borealis.

The length of the zodiacal light varies sometimes in reality, and sometimes in appearance only, from various causes.

The oblique position of this light, little different from

that of the plane of the ecliptic, does not permit us to see it distinctly, and sufficiently elevated above the horizon; but some time after sun-set, towards the end of the winter, and in spring, or before sun-rising in autumn, and towards the beginning of winter. Several causes hinder our seeing it, any more than the milky way; such as moon-light and strong twilights, among others.

M. Cassini often mentions the great resemblance of the zodiacal light to the tails of comets. M. Fatio has made the same observation; and M. Euler has lately endeavoured to prove them owing to similar causes. *Decouverte de la Lumiere Celeste que paroît dans le Zodiaque, art. 41. Lettre à M. Cassini, printed at Amsterdam, 1686. Euler, in Mem. de l'Acad. de Berlin, tom. ii.*

The figure of this solar atmosphere must be lenticular, or that of a flattened spheroid. M. de Mairan gives us a draught of its appearance and projection.

The extent of the zodiacal light from the sun to its point is seldom less than 45, sometimes 150 degrees in length; M. Pingré being on the torrid zone saw it 120 degrees; and its breadth varies from 8 to 30 degrees.

This light seems to have no other motion than that of the sun itself.

M. Euler observes, that if the sun has an atmosphere, the force of the impulse of light issuing from that globe must drive particles of that atmosphere before it; but as gravity is very strong at the sun, this impulse would never drive those particles beyond the limits of their atmosphere, were it not for the centrifugal force arising from the sun's motion round its axis. This being opposite to the action of gravity, diminishing its effects, the impulse of the light may considerably dilate the figure of the solar atmosphere, from what it would be if it arose from the gravity and centrifugal force of its particles only: and this dilatation will be very considerable near the sun's equator, and very small towards its poles. The action of light thus diminishing the action of gravity, M. Euler attempts to calculate how far this diminution of gravity may increase the extent of the sun's atmosphere about its equator. He finds a cubic equation, the roots of which express the semi-axis, or greatest amplitude of this atmosphere. He adds, that this equation having three real roots, it is possible that the solar atmosphere may become a ring surrounding the sun's globe, as the ring of Saturn surrounds the body of that planet. As the electric fluid is now generally acknowledged to be the cause of the aurora borealis, which M. de Mairan ascribes to the solar atmosphere, which produces the zodiacal light, and which is thrown off principally and to the greatest distance from the equatorial parts of the sun, in consequence of his rotation on his axis, and extending visibly, in the form of a luminous pyramid, as far as the orbit of the earth, falls into the upper regions of our atmosphere, and is collected chiefly towards the polar parts of the earth, in consequence of the diurnal revolution, where it forms the aurora borealis: it is no improbable conjecture, that the sun may be the fountain of the electric fluid, and that the zodiacal light, and the tails of comets, as well as the aurora borealis, lightning, and artificial electricity, are its various and not very dissimilar modifications. See *Theory of ELECTRICITY.*

ZODZISZKI, in *Geography*, a town of Lithuania, in the palatinate of Wilna; 52 miles E. of Wilna.

ZOEGEA, in *Botany*, was so named by Linnæus, in honour of his pupil and correspondent Dr. John Zoega, who visited Iceland, and communicated from thence, as well as from the neighbouring ocean, many new or rare plants, especially of the cryptogamic tribes, to the great Swedish naturalist. Dr. Zoega wrote a *Flora Islandica*, which has

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been several times printed, with Olafsen's, and von Troil's, accounts of that country. In the latter book this *Flora* is a mere catalogue of Linnæan names, the synonyms and descriptions being omitted. He wrote also a mineralogical work on Zeolites. The plant which bears his name was raised in the Copenhagen garden, from Siberian seeds, and communicated by himself to Linnæus.—Linn. Mant. 15. Schreb. Gen. 577. Willd. Sp. Pl. v. 3. 2276. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 5. 143. Juffl. 174. Poir. in Lamarck Dict. v. 8. 868. Gertn. v. 2. 452.—Clas and order, *Syngenesia Polygamia-frustranea*. Nat. Ord. *Compositæ capitatae*, Linn. *Cinarocephale*, Juffl.

Gen. Ch. Common *Calyx* ovate, imbricated, of numerous lanceolate, fringed scales; the inner ones linear-lanceolate, chaffy, longest. *Cor.* compound, radiant. Florets of the disk numerous, perfect, of one petal, with a slender tube, and a limb in five deep, lanceolate, erect segments; those of the radius fewer, neuter, of one flat, ligulate, abrupt, sharply five-toothed petal. *Stam.* in the florets of the disk, Filaments five, short; anthers united into a cylindrical tube. *Pist.* in the same florets, Germen short; style capillary, very long, erect; stigma short, cleft: in the radiant florets, Germen a rudiment only, without style or stigma. *Peric.* no other than the unaltered closed calyx. *Seeds* in the florets of the disk, solitary. Down bristly. In the radius none. *Recept.* bristly.

Eff. Ch. Receptacle bristly. Seed-down of simple bristles. Florets of the radius ligulate. *Calyx* imbricated.

Obs. Linnæus justly observes that this genus is very intimately related to *CENTAUREA* (see that article). Indeed the only difference consists in the flat, or ligulate, not tubular, florets of the radius. How far that distinction is sufficient, some persons have doubted; especially as the presence of the radiant florets themselves in *Centaurea*, has been thought but a casual occurrence, equivalent to double flowers in other natural orders. As long, however, as the *Syngenesia* family continues to be characterized at all by the different figure of the florets, *Zoegea* must remain separate from *Centaurea*.

1. *Z. Leptaurea*. Yellow *Zoegea*. Linn. Mant. 117. Suppl. 383. Willd. n. 1. Ait. n. 1. L'Herit. Stirp. Nov. 57. t. 29. (*Z. alleppica*; Jacq. Col. v. 1. 89. Ic. Rar. t. 177.)—Native of Siberia, according to a manuscript correction of Linnæus in his own Mantissa: other authors say, of the Levant. It appears to have been cultivated in Mr. Blackburne's celebrated garden at Orford, Lancashire, before the year 1779, when the catalogue of that rich collection was printed. This plant is a hardy annual, flowering in July and August. The stem is much branched, spreading in every direction, leafy, angular and roughish, twelve or eighteen inches high. Leaves alternate, distant, roughish, entire; the lower ones pinnatifid; the rest undivided, obtuse, tapering down into a footstalk. Flowers solitary, on long terminal stalks, large, near two inches broad. Scales of the calyx delicately fringed with tawny bristles. Corolla of a shining golden yellow.

Another species is described in the *Supplement* by Linnæus himself, under the name of *Z. capensis*. This is *Relbania pedunculata* of L'Heritier. See Willd. Sp. Pl. v. 3. 2136, and is the same thing as *Athanasia pumila*, Linn. Suppl. 362.

ZOFALA, in *Geography*. See SOFALA.

ZOFFANY, JOHAN, in *Biography*, was born at Frankfurt, about the year 1735. He came to England as a painter of small portraits when he was about 30 years of age. After passing some time with very little encouragement, he

at length was fortunate enough to attract public attention by a portrait of the earl of Barrymore, and thenceforward enjoyed considerable favour and encouragement. The most considerable of his productions at this period were portraits of the most celebrated dramatic performers in their favourite characters; as Garrick, in Abel Druggier, Sir John Brute, and Lord Chalkstone, &c.; Foote, in major Sturgeon; and Jacob, as Jacob Gallop; Foote and Weston, as Dr. Laft and the President, in the Devil on Two Sticks; Parsons, Moody, Branly, Aicken, and many others, whose likenesses he preserved most admirably, with all the variety of expression required for the characters they personified. One picture he painted of the members of the Royal Academy, in the hall of the Academy devoted to the study of the living figure, round which they here assembled, and it received universal applause.

He had the honour to be employed by his majesty, and painted portraits of the royal family; and he was engaged by the queen to paint for her a view of the Tribune of the Gallery at Florence. He was somewhat of a humourist, and it is said of him, that whilst he was engaged painting in the Florentine Gallery, the emperor of Germany visited the grand duke, and coming up to Zoffany in the Gallery, was much pleased with his performance, and asked him his name; and on hearing it, inquired what countryman he was; when he answered, an Englishman. Why, said the emperor, your name is German. True, returned the painter, I was born in Germany, that was accidental; I call that my country where I have been protected!

Soon after his return from Italy, he went to the East Indies, where he was much employed, and acquired a considerable fortune; but it disappeared upon his return home, and was only restored by a second adventure to the same hot-bed of wealth and disease. He again returned to England, but with diminished powers: yet he still continued to paint, and, among other works, produced an elaborate picture of the sacking of the wine vaults at the Tuileries, in 1792; a disgusting display of the atrocities of that eventful period. He lived to a very advanced age, but was reduced exceedingly in intellectual powers for some years before his decease, which happened in 1808. He was a member of the Royal Academy.

ZOFFINGEN, in *Geography*, a town of Switzerland, in the canton of Berne, on the Wigger. It was at one time imperial, after which it put itself under the count of Habsburg. In the 13th century it was subject to the house of Austria, from which it was taken by the Bernois, in the year 1415, and is the principal place of a bailiwick, with considerable privileges; 26 miles N.E. of Berne.

ZOGNO, a town of Italy, in the department of the Serio; 5 miles N. of Bergamo.

ZOGOCARA, in *Ancient Geography*, a town of Asia, in Greater Armenia. Ptol.

ZOGOR, in *Geography*, a town of Thibet; 16 miles W.S.W. of Zuenaga.

ZOHAUB, one of the districts of the province of the Lower Kurdistan, in the pachalic of Bagdad, which has a separate hakim or governor. See SOLYMANIA.

ZOHAUK, a town of Grand Bucharia; 12 miles N.E. of Bamian.

ZOHRRA, a town of Egypt, on the left bank of the Nile; 5 miles N.N.E. of Miniet Ebn Kafib.

ZOIKA, a town of Russia, in the government of Archangel, near the mouth of the Petchora; 160 miles N.E. of Mezen.

ZOILUS, in *Biography*, a carping critic belonging to the class of grammarians, was a native of Amphipolis, and lived

lived in the time of Ptolemy Philadelphus, about the year B.C. 270. His natural disposition to depreciate eminent characters is said to have been strengthened by the course of his education, as a disciple of Polycrates, who wrote an accusation against Socrates. This disposition, which he was in the habit of indulging, gave occasion to his being denominated the rhetorical dog; rhetorical, as his style was elegant, and dog, from his practice of snarling. Both his person and mind are very unfavourably exhibited by Ælian; who says of him, that being once asked, why he *spoke ill* of all mankind?—he replied, “because I cannot *do ill* to them.” Ambitious of gaining reputation, he endeavoured to acquire it by degrading others; and valued himself by having established a kind of claim to the title of “Homero-matix,” or the scourge of Homer. Suidas informs us, that he wrote nine books of grammatical remarks upon this poet. Plato and Iocrates, as well as Homer, were objects of his critical severity. Zoilus was the author of several works; particularly a history commencing from the theology, and continued to the death of Philip of Macedon, and a history of his own city. His attack upon Homer seems to have been an unpardonable offence, and threw a shade over every other good quality he possessed; for if we may credit Dionysius of Halicarnassus, he testifies that he was actuated by the love of truth, and he ranks him with Aristotle, and other eminent philologists. But his virtues and talents, whatsoever they were, could neither secure him from poverty whilst he lived, nor guard his memory from reproach. Vitruvius reports, that when he visited Alexandria, he recited his writings against the Iliad and Odyssey of Homer to king Ptolemy, which gave the king such offence, that he would take no notice of him; and afterwards, when urged by indigence, he solicited charitable assistance, Ptolemy repulsed him with this contemptuous reflection; that if Homer, who had been dead 1000 years, could by his works give maintenance to many thousand people, a writer so much his superior might surely maintain himself. It is further said, that the king was so much displeas'd with his conduct, that he treated him as if he had been guilty of parricide; and that he was put to death, as some say, by crucifixion, and as others say by stoning; and according to another account, he was burnt alive at Smyrna. Vitruvius adds, “that whichever of these was his fate, he well deserved the punishment.” The penalty, however, if this statement be true, seems to have been much more than adequate to the offence. Ælian Hist. Var. Voss. Hist. Græc. Gen. Biog.

ZOISITE, in *Mineralogy*, *Epidote*, Häuy, a mineral so called by Werner after baron Von Zois of Laybach.

Common Zoisite.—Its colours are yellowish and blueish-grey; it occurs massive and crystallized in very oblique four-sided prisms. The crystals are middle-sized, and deeply streaked longitudinally. The structure is lamellar, and the joints parallel with the axis of the crystal. The internal lustre is splendent; the lustre of the cross fracture is glistering, and between pearly and resinous; it is translucent, hard, and easily frangible. The specific gravity is 3.31. According to Klaproth, the constituent parts are,

Silex	-	-	-	42
Alumine	-	-	-	29
Lime	-	-	-	21
Oxyd of iron	-	-	-	3

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Friable Zoisite is of a reddish-white colour, spotted with

pale peach-blossom red; it occurs massive. The fracture is intermediate, between earthy and splintery; the fragments are very sharp-edged, and translucent on the edges; it is rather hard and brittle. The specific gravity of this mineral is 3.3. According to Klaproth, its constituent parts are,

Silex	-	-	-	44
Alumine	-	-	-	32
Lime	-	-	-	20
Oxyd of iron	-	-	-	2.50
				<hr/>
				98.50

Zoisite was first found in Carinthia, but has since been discovered in various parts of the continent of Europe, and at Glenelg in Invernesshire. It is nearly allied to tremolite, with which it was at first arranged.

ZOITIUM, in *Ancient Geography*, a town of the Peloponnese, in Arcadia; 15 stadia from Tricolons. Steph. Byz.

ZOK, SOKOR, in *Geography*. See **SOKOR Zok**.

ZOKOL, a town of Servia; 16 miles S. of Sabatz.—Alfo, a town of Bosnia; 45 miles E. of Bosnaferai.

ZOL ENGERS. See **ENGERS**.

ZOLCA, in *Ancient Geography*, a town of Asia, in Galatia, which belonged to the Paphlagonians, and was situated on the coast of the Euxine sea. Ptol.

ZOLDO, in *Geography*, a town of Italy, in the Bellunese; 18 miles N.W. of Belluno.

ZOLDORF, a town of Bohemia, in the circle of Bolelaw; 6 miles W.N.W. of Jung Buntzel.

ZOLERI, a town of the county of Tyrol; 8 miles S.S.E. of Trent.

ZOL-HUYS. See **TOL-HUYS**.

ZOLLERN, a castle of Germany, situated on a mountain, in the principality of Hohenzollern, to which it gives name; 10 miles S. of Tubingen.

ZOLLICKOFEN, a town of Switzerland, and principal place of a district, in the canton of Berne; 2 miles N.W. of Berne.

ZOLNOK, a town of Hungary, on the river Theyss; 48 miles W.S.W. of Debriczin.

ZOLOGEV, a town of Ruffia, in the government of Charcov; 24 miles N.N.W. of Charcov. N. lat. 50° 20'. E. long. 35° 44'.

ZOLOITZA, a town of Ruffia, in the government of Archangel, on the east coast of the White sea; 60 miles N. of Archangel.

ZOLOTONOSCHA, a town of Ruffia, in the government of Kiev; 72 miles S.S.E. of Kiev. N. lat. 49° 30'. E. long. 31° 58'.—Alfo, a river of Ruffia, which runs into the Dnieper, near Zolotonofcha, in the government of Kiev.

ZOLOTTA, or **SZELOTTA**, a silver coin of Turkey, containing 30 paras, the para being = 3 aspers.

ZOMBA, in *Geography*, a town of Africa, in the kingdom of Congo; 70 miles E. of St. Salvador.

ZOMBAR, a town of Hungary; 40 miles S. of Colofa. N. lat. 45° 56'. E. long. 19° 12'.

ZOMERAW, a town of Prussia, in Oberland; 12 miles N.E. of Bischofswerder.

ZOMUCHANA, in *Ancient Geography*, a town of Asia, in Aria. Ptol.

ZONA, or *Zona Uxoris Regie*, a very fertile country of Persia. It was so called because its revenue was destined for the accommodation of the queen. Plato.

ZONA, a word used by some authors for that species

of herpes, which others call the *zinzilla*, and we term the *shingles*.

ZONCHIO, in *Geography*, a cape of European Turkey, on the coast of the Morea; 12 miles N.N.W. of Navarin. N. lat. $37^{\circ} 12'$. E. long. $21^{\circ} 30'$.

ZONCHIO, a sea-port town of European Turkey, in the Morea: the harbour is large, but not commodious; 8 miles N. of Navarin.

ZONCOLUCAN, a mountain of Mexico, in the province of Guaxaca.

ZONDAGS, a river of Africa, which runs into the Indian sea. N. lat. $31^{\circ} 20'$. E. long. 29° .

ZONDORO, a town of Hungary; 26 miles S.W. of Cafchau.

ZONE, **ZONA**, ζων, q. d. *belt, girdle*, in *Geography* and *Astronomy*, a division of the terraqueous globe, with respect to the different degrees of heat found in the different parts of it; formed by the two tropics and two polar circles, which divide the surface of the earth into five parts.

The zones are denominated *torrid*, *frigid*, and *temperate*.

ZONE, *Torrid*, is a fascia, or band, surrounding the terraqueous globe, and terminated by the two tropics.

Its breadth, therefore, is $46^{\circ} 56'$. The equator running through the middle of it, divides it into two equal parts, each containing $23^{\circ} 28'$.

The ancients imagined the torrid zone uninhabitable.

ZONES, *Temperate*, are two fasciæ, or bands, environing the globe, and contained between the tropics and the polar circles. The breadth of each is $43^{\circ} 4'$.

ZONES, *Frigid*, are segments of the surface of the earth, terminated, the one by the antarctic, and the other by the arctic circle; or included between these circles and the poles. The breadth of each is $46^{\circ} 56'$.

The difference of zones is attended with a great diversity of phenomena.

1. In the torrid zone, the sun passes through the zenith twice a year; and his receds from the equator towards the pole, which is above the horizon, is twice a year equal to the height of the pole.

2. In the temperate and frigid zones, the least height of the pole exceeds the greatest distance of the sun from the equator; and therefore, to the inhabitants of it, the sun never passes through the zenith; yet if, on the same day, the sun rises, at the same time, to a greater height, the height of the pole is the less, since the inclination of the circles of diurnal revolution to the horizon is less.

3. In the temperate and torrid zones, the sun rises and sets every natural day, because the distance of the sun from the pole always exceeds the height of the pole; yet every where but under the equator, the artificial days are unequal, and the inequality is the greater as the place is less distant from the frigid zone.

4. Where the temperate zones terminate on the frigid, the height of the pole is equal to the sun's distance from the pole, when in the neighbouring tropic; and consequently, once a year, the sun, in its diurnal motion, performs an entire revolution, without going down under the horizon.

5. Every where, in a frigid zone, the height of the pole is greater than the least distance of the sun from the pole; and therefore, during some revolutions of the earth, the sun is at a distance from the pole less than the pole's height; and, during all that time, does not set, nor so much as touch the horizon. Where the distance from the pole, as the sun recedes from it, exceeds the height

of the pole, or latitude of the place, the sun rises or sets every natural day.

ZONE, *Cingulum*, or girdle, part of the ecclesiastical dress of the Roman Catholic ministers. The use of it being derived from the church of Rome, it was called *zona Romana*.

ZONE, *Ciliary*, in *Anatomy*, the black impression of the ciliary processes on the vitreous humour. See **EYE**.

ZONE, *Greater and Smaller, of the Iris*, arterial circles produced by the anastomoses of the arteries. See **EYE**.

ZONGHAN, in *Geography*, a town of Cochinchina, near the sea. N. lat. $14^{\circ} 30'$. E. long. $108^{\circ} 48'$.

ZONGO, or **MORENA**, a river of Africa, which runs into the Atlantic, near Old Benguela.

ZONITES, in the *Materia Medica of the Ancients*, a name given to a kind of tutty, called also *placitis*. It had the latter name from the Greek *πλακος*, a *crust*, it being formed by way of crust on the sides of the furnaces. The latter name *zonites* was given from its being formed of several coats, which, when broken transversely, had the appearance of belts or zones. See **TSAPHARI**, and **TUNEX**.

ZONITIS CADMIA, a name given by some authors to a kind of *cadmia fornacum*, from its usually surrounding the upper parts of the furnaces like a girdle or belt.

ZONITIS, in *Entomology*, a genus of the *coleoptera* order of insects, the characters of which are, that the antennæ are setaceous; the palpi four and filiform, and shorter than the whole jaw; and the lip emarginated. There are two species; viz.

CHRYSOMELANA. Yellow, the wing-sheaths having a point in the middle, and the apex black: found in Egypt and the East.

FLAVA. Reddish, with wing-sheaths yellow, and black at the apex.

ZONNAR, a kind of belt, or girdle, of black leather, which the Christians and Jews of the Levant, particularly those of Asia, and the territories of the grand signior, are obliged to wear, to distinguish themselves from the Mahometans.

The word is corrupted from the vulgar Greek; a contraction of ζωνητορας, or ζωνης, *girdle*.

It was Motavakkel X. kaliph, of the family of the Abafides, that first enjoined the Christians, &c. to wear the zonnar.

The ordinance to this effect was published in the year of the Hegira 235.

Hence, as most of the Christians of Syria, Mesopotamia, &c. are either Nestorians or Jacobites, those sectaries are often called *Christians of the girdle*.

ZONOSBIO, in *Geography*, an Indian town, belonging to the Seneca tribe; 2 miles N. of lake Seneca.

ZONS, a town of France, in the department of the Roer, situated on the Rhine, with a castle: at this place a river-toll is paid; 13 miles N.N.W. of Cologn. N. lat. $51^{\circ} 4'$. E. long. $6^{\circ} 43'$.

ZOOGRAPHY, formed of ζων, *animal*, and γραφω, *I describe*, denotes a description of animals.

ZOOATRIA, Ζωολατρία, composed of ζων, *an animal*, and λατρία, *worship*, a species of idolatry, in which divine worship was offered to animals.

ZOOLOGIA, **ZOOLOGY**, Ζωολογια, compounded of ζων, *life*, or ζων, *animal*, and λογος, *speech, discourse*, a discourse or treatise upon animals, or living creatures.

Zoology makes a considerable article in natural history, comprehending what relates to the form, structure, method of living, feeding, propagating, &c. of the divers species

ZORAH, in *Geography*, a town of Africa, on the coast of Barca. N. lat. $30^{\circ} 45'$. E. long. $18^{\circ} 30'$.

ZORAMBUS, in *Ancient Geography*, a river of Asia, in Carmania. Ptol.

ZORBIG, or LITTLE ZERBST, in *Geography*, a town of Saxony, in the circle of Leipzig, with a citadel; 15 miles S. of Delfau. N. lat. $51^{\circ} 40'$. E. long. $12^{\circ} 18'$.

ZORECZA, a town of Lithuania; 80 miles E.S.E. of Pinski.

ZORGE, a town of Saxony, belonging to the abbey of Walkenried; 6 miles N.E. of Walkenried.

ZORGE, a river of Thuringia, which runs into the Helm, 5 miles W. of Nordhausen.

ZORIGA, in *Ancient Geography*, a town of Asia, in the Greater Armenia, to the left of the Euphrates, and at some distance from it. Ptol.

ZORILLE, in *Zoology*, a species of weasel, having the back and sides marked with short stripes of black and white, the last tinged with yellow; the tail long and bushy, partly white, and partly black; the legs and belly black. This animal inhabits Peru, and other parts of South America: its pestiferous vapour overcomes even the panther of America, and it stupefies that formidable enemy. Pennant. See VIVERRA.

ZORITA, in *Geography*, a town of Spain, in New Castile; 12 miles N.W. of Huete.

ZORLESCA, a town of Italy; 8 miles S.S.E. of Lodi.

ZORN, a river of France, which rises near Saverne, in the department of the Lower Rhine, passes by Brumath, and enters a canal which communicates with the Rhine, 8 miles N. of Straßburg.

ZORNDORF, a town of the New Mark of Brandenburg, where the king of Prussia defeated the Russians in the year 1758, near Custrin.

ZORNIA, in *Botany*, received that name from the late professor Gmelin of Göttingen, the compiler of a very faulty edition, at least as to the botanical department, of the *Systema Naturæ* of Linnæus. He chose this appellation for one of Walter's anonymous genera, which he himself knew nothing of. It has been adopted by Michaux and Pursh, and seems intended for the commemoration of Mr. John Zorn, an apothecary of Kempten, in Bavaria, who was born in the year 1739, and may possibly be still living. He has published five volumes in octavo of *Icones Plantarum Medicinalium*, each volume containing one hundred plates, with a Latin and German text. These figures are coloured in the Nuremberg stile; at which place the work appeared, between the years 1779 and 1784. There was, moreover, a Dr. Bartholomew Zorn of Berlin, who published there, in 1714, *Botanologia Medica*, a thick German quarto, with six plates. He edited also, in 1673, the *Herbarium portatile* of Thomas Pancorius, and according to Dr. Andri. Bibl. Banks, v. 5. 496, died in 1717, at the age of 78.—Gmel. *Syst. Nat.* v. 2. 1096. Michaux Boreal-Amer. v. 2. 76. Pursh 484. Poir. in Lamarck Dict. v. 8. 872. (Anonymus n. 279; Walt. Carol. 181.)—Class and order, *Diadelphica Decandria*. Nat. Ord. *Papilionacea*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-shaped, two-lipped; upper lip broad, abrupt, emarginate; lower in three deep segments, the middle one longest. *Cor.* papilionaceous: standard inversely heart-shaped, reflexed, revolute at the sides; wings ovate, erect, smaller than the standard: keel divided at the base, bluntly rectangular, the length of the wings. *Stam.* Filaments in two sets: anthers five of them oblong, five alternate ones globose. *Pist.* Ger-

men ovate; style awl-shaped, horizontal; stigma simple. *Peric.* Legume of several, roundish, compressed, single-seeded joints, hispid with barbed prickles, not bursting. *Seeds* solitary, kidney-shaped.

Eff. Ch. Calyx bell-shaped, two-lipped; the upper lip abrupt. Standard revolute. Keel angular. Five alternate anthers oblong; five globose. Legume of several single-seeded, closed, hispid joints.

Obs. The habit of this genus is so peculiar, and so unlike *HEDYSARUM*, much more resembling *STYLOSANTHES*, (see those articles), that we are very glad of any characters that may serve to keep it distinct, and we hope the above may suffice. The plants are herbaceous, with one or two pair of conjugate leaves, without an odd one. Flowers small, in axillary spikes, with large leafy bractæes. The species have not yet been well discriminated. We shall endeavour to explain them, with the help of original specimens.

1. *Z. angustifolia*. Narrow-leaved Zornia. (*Hedyarum diphyllum* α ; Linn. Sp. Pl. 1053. Willd. Sp. Pl. v. 3. 1178. Lamarck Dict. v. 6. 404, excluding the variety H. n. 291; Linn. Zeyl. 134, excluding Sloane's synonym, and the variety β . H. bifolium, filiculus articulatus echinatis; Burm. Zeyl. 114. Onobrychis materulipatana diphyllum minor, filiculus hirsutus; Pluk. Phyt. t. 246. f. 6. "Nelam-mari; Rheede Hort. Malab. v. 9. 161. t. 82." Raii Hist. v. 3. 404.)—Leaflets two, lanceolate, uniform. Bractæes ovate, ribbed, fringed, imperfectly reticulated, shorter than the legume, marked with glandular dots. Prickles of the legume rough.—Native of the East Indies, in a sandy soil. Root annual, tapering, warty. Stems several, diffuse, from four or five inches to a foot long, round, slender, zigzag, smooth, leafy, with short alternate branches. Leaves simply conjugate, alternate; leaflets from half an inch to an inch long, elliptic-lanceolate, entire, bluntnish, tipped with a small point, unequal at the base, smooth on both sides, not quite sessile at the extremity of the common foot-stalk, which is about the length of the leaflets, cylindrical, smooth, with a longitudinal furrow above. Stipulas half-arrow-shaped, ribbed, entire, pointed at each end. Flowers yellow, in axillary, solitary, stalked, lax, bracteated spikes, longer than the leaves, each spike of from three to eight alternate flowers. Bractæes one pair to every flower, twice as long, two-ranked, converging, flat, ovate, acute, entire, strongly fringed, three or five-ribbed, besprinkled with resinous dots, elongated at the base into a short oblique spur, permanent, their surface smooth. Legume near an inch in length, longer than the bractæes, of about four semi-orbicular joints, finely reticulated, and beset with spreading, brown, barbed prickles, which are rough with minute reversed hairs, but we cannot perceive that the surface of the legume itself is downy, at least not invariably. The resinous dots scattered over the bractæes seem peculiar to this species. Those parts are full as much fringed in this as in the *H. conjugatum* of Willdenow, though his definitions indicate otherwise.

2. *Z. reticulata*. Reticulated Zornia. (*Hedyarum diphyllum* β ; Willd. Sp. Pl. v. 3. 1178. β ; Lamarck Dict. v. 6. 404. H. diphyllum; Swartz Obs. 285. H. n. 10; Browne Jam. 301, excluding the synonyms. H. minus diphyllum, flore luteo; Sloane Jam. v. 1. 185.)—Leaflets two, lanceolate; the lower ones elliptical. Bractæes ovate, as long as the legume, strongly reticulated and fringed, without glandular dots. Legume and its prickles downy.—Native of the dry sandy parts of the savannahs of Jamaica. Our specimens are from Browne himself. The root, though said to be annual, is somewhat woody. Herb larger than the last, and most unquestionably specifically distinct. The stems are straight, a foot long, scarcely branched. Leaflets an inch

inch or an inch and a quarter in length; those of the lower leaves half an inch broad. *Spikes* many-flowered, thrice as long as the leaves. *Flowers* yellow; the standard sometimes purplish. The *bractæas* afford a clear specific distinction, in their strongly-marked, elevated, veiny reticulations, and the total want of refinous or glandular dots, though their whole surface is minutely granulated, as it were, like those of the foregoing species. The *legumes* have three or four joints, and their surface, as well as their prickles, is downy. They are almost entirely covered by the *bractæas*.

3. *Z. conjugata*. Ovate *Zornia*. (*Hedyfarum conjugatum*; Willd. Sp. Pl. v. 3. 1178. H. *diphyllum* β ; Linn. Sp. Pl. 1053. H. n. 291, β ; Linn. Zeyl. 135. H. *bifolium*, *foliolis ovatis*, *filiculis asperis*, *geminis*, *inarticulatis*; Burm. Zeyl. 114. t. 50. f. 1. *Onobrychis maderafatana* *diphyllus*, *filiculis asperis*; Pluk. Phyt. t. 102. f. 1.)—Leaflets two, ovate, uniform. *Bractæas* ovate, ribbed, fringed, imperfectly reticulated, shorter than the legume, without glandular dots. *Legume* fringed; its disk and prickles smooth.—Native of Ceylon and Tranquebar. This species approaches the last in size, but differs in many essential points. The *leaflets* are ovate, not near so long as their common *footstalk*. *Bractæas* more pointed and elongated at the base, ribbed, but not strongly reticulated; their substance quite destitute of pellucid dots, though some of them occasionally bear little black opaque prominences, which seem the effect of injury, or are perhaps a minute parasitical fungus. *Legumes* considerably longer than the *bractæas*, though each consists of scarcely more than two orbicular joints, full twice the size of either of the preceding species, from which they differ in the smoothness of their disk and prickles, though fringed at the edge. The *flowers* are yellow.

4. *Z. latifolia*. Broad-leaved *Zornia*. (*Hedyfarum diphyllum*; Aubl. Guian. 774, excluding all the synonyms.)—Leaflets two, roundish-ovate; the lower ones orbicular. *Bractæas* linear-lanceolate, ribbed, somewhat hairy, longer than the downy legumes.—Gathered in Guiana by Aublet, from whom we have specimens, which abundantly shew his plant to be different from any of the foregoing, and justify him in saying that, with respect to it at least, Plukenet's figures are bad. This has a woody, but perhaps annual, root, and several prostrate stems, from six inches to a foot long, straight, round, downy. *Footstalks* also downy, rather longer than the *leaflets*, which in the lower leaves are about half an inch in length, nearly orbicular, obtuse; in the upper gradually more elongated, ovate, or ovato-lanceolate, acute; all of them somewhat hairy or silky, especially beneath, where also they are a little glaucous. The narrow *bractæas*, very differently shaped from any of the three preceding species, are the distinguishing characteristic of this: they have three very strong crowded ribs, originating from their point of insertion, below which is a blunt elongation downwards, most like that of *Z. reticulata*; they are somewhat hairy, as well as slightly fringed. *Corolla* yellow. *Legume* of only two joints, unless any have been broken off, which is not apparent; the prickles downy, and the disk quite woolly. Willdenow speaks of a supposed variety of *Hedyfarum diphyllum* from Portorico, which is larger than the common kind, and whose leaves are "strigose beneath;" by which expression is probably meant brittle, or hairy. This, if not our *Zornia latifolia*, must be a hitherto non-descript species, of which we have not materials to give a definition.

5. *Z. heterophylla*. Various-leaved *Zornia*. (*Hedyfarum tetraphyllum*; Thunb. Aët. Nov. Upsal. v. 6. 44. t. 3.

Prodr. 132. Willd. Sp. Pl. v. 3. 1203. Lamarck Dict. v. 6. 405, variety δ .)—Leaflets three or four, lanceolate. *Stipulas* half-arrowshaped. Base of the *bractæas* elongated and acute.—Gathered by Thunberg in the interior part of the country, above the Cape of Good Hope, near Gagebosch, flowering in November and December. The stem is herbaceous, decumbent, thread-shaped, smooth, a foot or more in length. *Footstalks* rather longer than the *leaflets*, which are three or four together, elliptic-lanceolate, acute, entire, hardly an inch long. *Stipulas* much elongated at the base, acute at each end. *Spikes* axillary, many times longer than the leaves, (at least the lower spikes,) and consisting of ten or twelve flowers, concealed by the ovate three-ribbed *bractæas*, each of which is elongated at the base into an ovate acute appendage, nearly half its own length. *Legume* longer than the *bractæas*, of four joints, said by Thunberg to be rough, but in what manner, or degree, is not mentioned: his figure represents them smooth and globose, which is evidently an inaccuracy.

6. *Z. tetraphylla*. Four-leaved *Zornia*. Michaux Boreal-Amer. v. 2. 76. t. 41. Pursh n. 1. (*Z. bractæata*; Gmel. n. 1. *Anonymos bractæata*; Walt. Carol. 181. *Hedyfarum tetraphyllum*; Lamarck Dict. v. 6. 405, α .)—Leaflets four, lanceolate. *Stipulas* ovate. Base of the *bractæas* somewhat elongated, obtuse.—Native of sandy fields in Lower Carolina. Perennial, flowering in July and August. About a foot high, much branched. *Flowers* yellow. *Pursh*. We have here ventured to distinguish this from the last-described species, by the characters afforded in the plates cited, without our having ever seen a specimen of either. We are fully aware of the hazard of such a proceeding; but as it is highly probable that a Cape plant will hardly prove, on comparison, the same species as a Carolina one; and the species of this genus very nearly resemble each other, and have been much confounded, we propose the above characters. If the figure of Michaux be exact, as to the *stipulas* and *bractæas*, there can be no doubt on the subject, and it was drawn by no less an artist than Redouté. The *stipulas* are there represented perfectly ovate, without any spur, or elongation, at the base, and not half the usual size in this genus. Those of Thunberg's plate are like the rest of the species. This is the most important difference, though the short and blunt spur of the *bractæas* is very striking also. The *flowers* seem larger in these two last, than in any of the foregoing.

On reviewing the whole genus, we cannot but repeat that the abruptly-compounded leaves afford a most important mark of difference, compared with *Hedyfarum*, nor are the yellow flowers, in this case, entirely unworthy of consideration. There is moreover too close a resemblance between all the species of *Zornia*, as to induce a persuasion of their constituting a very natural genus. The same may be said of *STYLOSANTHES*, to which we have already referred the reader as being next akin to *Zornia*.

Which of the above six species, or rather which of the first four, is entitled to a place in the *Horius Kewensis*, we cannot presume to determine. In v. 4. 340. of that work, Dr. Houttoun is recorded as having sent to Miller, before the year 1733, something which has always passed for *Hedyfarum diphyllum*. This must have come from South America, or the West Indies, and was therefore not *Nelam-mari* of Rheede, our *Zornia angustifolia*; nor the *conjugata*, a plant of Ceylon. It must have been either the West Indian *reticulata*, or more probably perhaps the South American *latifolia*.

ZOROANDA, HAZOUR, in *Ancient Geography*, a place of

ZOROASTER.

of Asia, on a part of mount Taurus, called Nicephates, where the Tigris opened a subterranean passage, N.W. of Amida.

ZOROASTER, ZERDUSHT, or ZARDUSHT, in *Biography*, an eminent Eastern philosopher, concerning whom, as well as the age in which he lived, learned writers have entertained very different opinions. Some have ascribed this title, the derivation of which is uncertain, to some eminent persons; whilst others have maintained that there was but one Zoroaster, and that he was a Persian. Others have said that there were six celebrated founders of philosophy of this name. Ham, the son of Noah, Moses, Othris, Mithras, and others, both gods and men, have by different writers been asserted to have been the same with Zoroaster. Many different opinions have been also advanced concerning the time in which he flourished. Aristotle and Pliny fix his date at so remote a period as 6000 years before the death of Plato: Hermippus says, that he lived 5000 years before the Trojan war; but these are idle tales, which should, without doubt, be classed with the report of the Chaldeans, concerning the antiquity of their astronomical observations. According to Laertius, he flourished 600 years before the Trojan war; according to Suidas 500. We shall in the sequel of this article detail the opinions of some of our principal modern writers on this subject. According to Brucker, the most probable hypothesis is, that there was a Zoroaster, a Perfo-Median, who flourished about the time of Darius Hytaspes, and that besides him there was another Zoroaster, who lived in a much more remote period among the Babylonians, and taught them astronomy. The Greeks and Arabians are agreed concerning the existence of the Persian Zoroaster; and the ancients unanimously ascribe to a philosopher, whom they call Zoroaster, the origin of the Chaldean astronomy, which is certainly of much earlier date than the time of Hytaspes; so that it seems necessary to suppose a Chaldean Zoroaster distinct from the Persian. Concerning this Zoroaster, however, nothing more is known, than that he flourished towards the beginning of the Babylonish empire, and was the father of the Chaldean astrology and magic. (See *CHALDEAN Philosophy and MAGI*.) All the writings which have been ascribed to the Chaldean Zoroaster are unquestionably spurious. The Persian Zoroaster was probably of Persian extraction, and born in Media. Although much of what has been related concerning this Zoroaster or Zerdusht, and the instruction which he received from the Jews, is fabulous; nevertheless it is not improbable that he might have learned some things from the Israelites who resided in Babylon, that might enable him to correct the doctrine of the Persian magi; but it is not easy to specify particulars. Several miracles are ascribed to Zoroaster, but they are of such a kind as an impostor would not find it very difficult to perform. (See *MAGI*.) To Zerdusht, or the Persian Zoroaster, many writings are ascribed; particularly the *Zend*. (See *ZENDAVESTA*.) Fragments of a work, entitled "The Oracles of Zoroaster," are still extant. Several editions of them under the form of verses have been published, and pains have been taken to explain them. Stanley has subjoined to his "Lives of the Philosophers" a correct translation of them. The philosophers of the Alexandrian school highly venerate them as genuine remains of Chaldean wisdom: but they have so many evidences in their ideas and language of their origin in that school, as to render it probable that they were written by some Platonicist, about the beginning of the second century; a period in which spurious writings were produced in order to support the sinking credit of Gentile philosophy.

The learned Dr. Hyde, and after him Dr. Prideaux and several others, are of opinion, that Zoroaster was the same with the Zerdusht of the Persians, who was a great patriarch of the Magians, and that he lived between the beginning of the reign of Cyrus, and the latter end of that of Darius Hytaspes.

Dr. Warburton (*Legation*, vol. ii. part i. p. 8.) censures Hyde and Prideaux for making an early Bactrian law-giver to be a late Persian false prophet, and says this whole story of him is mere fable, contradicting all learned antiquity, and supported only by the romantic relations of later Persian writers under the caliphs.

Dr. Baumgarten likewise (*Anc. Un. Hist. Suppl.* vol. ii. p. 365, &c.) represents it as doubtful, whether the Persian Zoroaster ever existed, calls in question the credibility of the oriental writers who give his history, and makes the whole to be a forgery in later times by the fire-worshippers of Persia.

The learned Mr. Bryant (*Anal. Anc. Mythol.* vol. ii. p. 107.) observes, that there are more persons than one spoken of under the character of Zoroaster; though there was one principal to whom it more truly related. Of men, styled Zoroaster, he says, the first was a deified personage, revered by some of his posterity, whose worship was called *Magia*, and the professors of it *Magi*. This worship was transmitted from the ancient Babylonians and Chaldeans to the Persians, who, succeeding to the sovereignty of Asia, renewed under their princes, and particularly under Darius, the son of Hytaspes, those rites which had been in a great degree effaced and forgotten. The Persians, says this learned writer, originally derived their name from the deity *Perez*, or *Parez*, the sun; whom they also worshipped under the title of *Zor-After*. On occasion of the distress to which they were reduced upon the death of their last king *Yesdegerd*, they retired into *Gedrosia* and *India*, where people of the same family had for ages resided, and carried with them some flattered memorials of their religion in writing, whence the *Sadder*, *Shafter*, *Vedam*, and *Zendavesta*, were compiled; and upon these the religion of the *Brahmins* and *Persees* is founded. The person who is supposed to have first formed a code of institutes for this people is said to have been one of the *Magi*, named *Zerdusht*; the same, as Hyde and others suppose, both in character and name, with Zoroaster: but Mr. Bryant discovers no resemblance between them. There were, indeed, many persons of this name in different parts of the world, who were magi or priests, and denominated from the rites of Zoroaster, which they followed. We read of an *Assyrian*, *Medo-Persian*, *Proconnesian*, *Bactrian*, *Pamphylian*, *Chinese*, &c. Zoroaster, supposed by Dr. Hyde to have been one and the same. But Mr. Bryant thinks that their respective histories furnish evidence sufficient of their being different persons; and besides, there seems to have been one person more ancient and celebrated than the rest. As for the Zoroaster or Zerdusht of Hyde, he lived in the reign of Darius, the father of Xerxes, about the time of the battle of Marathon, and consequently not a century before the birth of Eudoxus, Xenophon, and Plato. This Zerdusht, who was the renewer of the Sabian rites, could not be the person so much celebrated by the ancients, and referred to the first ages. Xanthus Lydius makes him above 600 years prior to the reign of Darius; Suidas places him 500 years before the war of Troy; Hermodorus Platonicus, Hermippus, and Plutarch, refer him to 5000 years before that era; Eudoxus supposed him to have flourished 6000 years before the death of Plato; and Pliny places him many

many thousand years before Moses. Upon the whole it appears, that no memorial upon record is placed so high as the ancient writers have carried this personage; and though their accounts are for the most part exaggerated, yet they fully ascertain the antiquity of this person.

The title Zoroaster, Mr. Bryant conceives, originally belonged to the sun, and was metaphorically bestowed on sacred and enlightened personages. Some have thought, that the first among men to whom this title was applied was Ham; others have taken him for Chus, for Mizraim, and for Nimrod, and Huetius for Moses. But Mr. Bryant, after examining the primitive characters given of him by different writers, supposes, that they concur only in Noah, who was the first deified mortal, and the prototype in the Magian worship. This writer supposes, that, as the object of the Perfic and Chaldaic worship was the sun, and most of their titles were derived thence, Zoroaster denoted Sol Aferius; Zor being the sun, and Afer signifying star.

The abbé Foucher, in a long series of memoirs, inserted in the 25th, 26th, 27th, 28th, 30th, and 31st vols. of the *Histoire de l'Académie Royale des Inscriptions et Belles Lettres*, &c. Paris, has given an ample account of the religion of the Persians. This learned author maintains, on the authority of Pliny, that the most celebrated Zoroaster was an ancient sage, who lived under Cyaxares, king of the Medes, restored the worship of fire, was revered by the Persians as a celestial prophet, and whose extacies, prodigies, and revelations, made a great noise in the world. See ZENDAVESTA.

ZOROPASSUS, in *Ancient Geography*, a town of Asia, in Lesser Armenia, dependent on the prefecture of Muriante. Ptol.

ZORVI, in *Geography*, a town of Asiatic Turkey, in the province of Diarbekir; 22 miles E. of Ana.

ZOSAWA, a river of Moravia, which runs into the Friaava, 5 miles W. of Hohenstadt.

ZOSIMA, in *Botany*, an umbelliferous genus, thus called by professor Hoffmann, in compliment to three brothers, Anastatius, Nicholas, and Zoa Zosima, distinguished for their editions of numerous works of the Greek classics. This botanical commemoration seems chiefly owing to the great propensity, ("magna propensio,") of the latter of these brothers, for natural history. We presume not to dispute the claim, because the author of this name is, doubtless, better able to judge of its propriety than we can possibly be.—Hoffm. Umbell. v. 1. 145. t. 1. B. f. 9.—Class and order, *Pentandria Digynia*. Nat. Ord. *Umbelliferae*.

Gen. Ch. *General and partial Umbel* of many unequal rays. *General and partial involucrium* of many, linear-lanceolate, acute, unequal, villous, permanent leaves. *Perianth* of five unequal, very short, permanent teeth. *Cor. Universal* nearly regular and uniform; *flowers* partly perfect and fertile; the central and lateral ones, in each umbel, male: *partial* of five, nearly equal, spreading, inversely heart-shaped, deflexed petals; rather concave, on each side, at the keel; tapering at the base; obliquely inflexed at the point, which is linear-lanceolate, acute, involute, channelled. *Stam.* Filaments five, spreading or deflexed, straight, longer than the involute corolla, dilated at the base; anthers versatile, roundish, two-lobed. *Pist.* in the perfect florets, *Germen* inferior, ovate, compressed, villous; styles two, thread-shaped, channelled; their tumid base wavy and crenate at the margin; at length reflexed and permanent; stigmas simple, obtuse. *Peric.* Fruit roundish-obovate, compressed, finely downy, bordered; the border externally tumid, and somewhat corrugated, internally striated; emarginate at the summit, crowned with the styles

on their short, nearly sessile, crisped base; thickened at the bottom; the disk elevated and striated. *Seeds* two, of a similar shape, convex in the middle, with three elevated, narrow, central ribs, and two marginal ones; their interstices, in the upper half, occupied by four coloured stripes.

Eff. Ch. *General and partial involucrium* of many permanent leaves. *Corolla* uniform. Some flowers male. *Calyx* tumid, five-toothed. *Petals* nearly equal, obovate, inflexed. *Fruit* roundish-obovate, compressed, villous, with a corrugated border; the disk ribbed.

1. *Z. orientalis*. Oriental Zosima. Hoffm. n. 1. (*Heracleum abinthifolium*; Venten. *Choix de Pl.* 7. t. 7. *March.* a *Bieberit*. *Taur.-Caucas.* v. 1. 224. *Sphondylium orientale humiliss.* foliis abinthii; *Tourn. Cor.* 22.)—Native of Persia, Georgia, and other countries about Caucasus, flowering in the early part of summer. The root is biennial, tap-shaped, milky. The whole herb when bruised smells like Smallage, *Apium graveolens*. *Stem* erect, near two feet high, cylindrical, furrowed, somewhat branched, and slightly leafy, about as thick as a swan's quill, rough to the touch with short whitish hairs. *Leaves* opposite, stalked, thrice pinnate, hoary with short pubescence; leaflets small, wedge-shaped, lobed; entire at the edges. *Umbels* two or three inches in diameter, on long stalks, terminal: *partial* ones of from twelve to fifteen flowers, which, according to Ventenat, are milk-white, but Hoffmann describes the petals of a yellowish-green. *Germen* downy. If the flowers are really white, we should suspect this plant to be nearly related to *Heracleum tomentosum*, Sm. *Prodr. Fl. Græc.* Sibth. v. 1. 192, which will be exhibited in t. 281. of the *Fl. Græca*; but the shape of the fruit of the latter is very unlike Hoffmann's figure, nor does it better agree with the representation in Ventenat's work. This last indeed is itself so unlike Hoffmann's t. 1. B. f. 9, (he himself erroneously cites f. 7,) that we cannot but suspect some mistake. Nor are we, after all, persuaded that the plant under consideration ought to form a separate genus from *Heracleum*. In so natural a family, the skill of a botanist is shewn in combining, rather than dividing, which last is the most easy thing in the world, and the most pernicious to science. We do not, however, pretend to decide in the present case; because the generic distinctions of Umbellate plants are still *sub judice*.

ZOSIMUS, in *Biography*, a Greek historian, who held various civil offices under the younger Theodosius, about the commencement of the fifth century, and left a history of Roman affairs in six books; the first of which furnishes a slight view of the emperors, from Augustus to Diocletian; and the others detail the public events that occurred to the second siege of Rome by Alaric, and the pontificate and deposition of Attalus. Something seems to be wanting towards the end. The style of this historian is concise, perspicuous, and pure; but his prejudices against the Christian emperors have misled him; and particularly in his account of Constantine the Great. Leunclavius has attempted to justify him; and it has been allowed that he has divulged some truths which other historians have suppressed. Gibbon says, "credulous and partial as he is, we must take our leave of this historian with regret." The first edition of his work was that of R. Stephens, in 1581; others have been published by T. Smith, Gr. and Lat. Oxon. 1679, 8vo.; and the Variorum by Cellarius, 8vo. 1679, 1712.

ZOSIMUS, *Pope*, a native of Greece, was elevated to the pontifical throne in March 417, as successor to Innocent I.; at the time when the Pelagian controversy prevailed. Cælestius, the chief disciple of Pelagius, presented his confession of faith to this pope, who approved it and admitted

him to his communion. That of Pelagius was likewise approved. The African bishops, however, who were hostile to the Pelagian doctrine, interested the emperor Honorius in their favour; and obtained from the pope an anathema of the doctrine of Pelagius and Cælestius, with a sentence of excommunication if they refused to abjure their tenets. A council was assembled, in which other bishops, who concurred in the Pelagian creed, were degraded from their episcopal dignity. The fluctuations and inconsistencies of Zosimus's conduct depreciated the character of the pope, and furnished reason for questioning his infallibility. Other instances occurred, in which he was hardly able to maintain his authority. This pope died in December 418, leaving the character of an able man of business, but haughty, tenacious, and imperious. His thirteen epistles, that are extant, are written with spirit and elegance. He was canonized, as Bower says, by a mistake of cardinal Baronius, who supposed him to be a St. Zosimus in the martyrology of Bede. Dupin. Bower.

ZOSITERPUM, in *Ancient Geography*, a town of Thrace, in the province of Rhodope. Procopius.

ZOSSEN, in *Geography*, a town of Brandenburg, in the Middle Mark; 13 miles S.E. of Potzdam. N. lat. 52° 10'. E. long. 13° 17'.

ZOSTER, in *Ancient Geography*, a borough of Attica, upon the sea-coast, with a promontory of the same name, extended into the Saronic gulf; but it is not known to what tribe it belonged. Minerva, Apollo, Diana, and Latona, were honoured here. As Zoster bore some resemblance to zone, or cincture, the inhabitants pretended that the borough bore this name, because Latona, finding herself in this place, and feeling that her time was approaching, unloosened her cincture. Pauf. in Attic. c. 31.

ZOSTER, a word used by some to express that kind of herpes, called by others *zona* and *zingilla*, and by us usually known under the name of the shingles.

ZOSTERA, in *Botany*, so named by Linnæus from ζῶστis, a girdle, alluding to the ribband-like appearance of its long linear foliage.—Linn. Gen. 472. Schreb. 615. Willd. Sp. Pl. v. 4. 179. Vahl Enum. v. 1. 14. Mart. Mill. Dict. v. 4. Sm. Fl. Brit. 7. Prodr. Fl. Græc. Sibth. v. 1. 2. Pursh 2. Lowner Prodr. Nov. Holl. v. 1. 338. Juss. 24. Poir. in Lamarck Dict. v. 8. 872. Lamarck Illustr. t. 737. Gærtner. t. 19. (Alga; Raii Syn. ed. 3. 52. Ruppia; Moehring in Phil. Trans. v. 41. 217.)—Class and order, *Monandria Monogynia*, Fl. Brit. and Vahl. (Gynandria Polyandria, Linn. Monoclea Monandria, Schreb. and Willd.) Nat. Ord. *Piperites*, Linn. *Aroides*, Juss. *Aroides affinis*, Brown.

Gen. Ch. *Cal.* Spadix linear, flat, sheathed by the base of a leaf, bearing an indeterminate number of flowers on one side. Perianth none. *Cor.* none. *Stam.* Filament none; anther sessile, erect, closely pressed to the spadix, simple, cylindrical, a little wavy, tapering at each end. *Pist.* Germen solitary, parallel to the anther, and of nearly a similar shape; style one, obliquely curved, shorter than the germens; stigmas two, linear, acute, spreading. *Peric.* Capsule pendulous, elliptical, membranous, of one cell, not bursting. *Seed* solitary, oblong, striated.

Eff. Ch. Spadix linear, sheathed by the base of a leaf, bearing the flowers on one side. Perianth and Corolla none. Anther sessile. Stigmas two, linear. Capsule with one seed.

Obs. The above is the view of the genus in question, first given by Gærtner, and confirmed from actual observation in the *English Botany* and *Fl. Brit.* Vahl adopts the same idea as ours of the place of this genus in the artificial system. The seed has a large, oval, half divided cotyledon, as we

would call it; Gærtner terms it a *vitellus*. (See the article *Yolk of the Seed*.) From this genus is to be separated the *Z. oceanica* of Linnæus, which belongs to *Caulinia* of De Candolle and Brown; *Pessifonia* of König in Ann. of Bot. v. 2. 95. t. 6; *Kernera* of Willd. Sp. Pl. v. 4. 947; but which is different from *CAULINIA* of Willdenow; see that article.

1. *Z. marina*. Common Grass-wrack. Linn. Sp. Pl. 1374. Willd. n. 1. Vahl n. 1. Fl. Brit. n. 1. Engl. Bot. t. 467. Fl. Dan. t. 15. Pursh n. 1. Brown n. 1? (Zoster; Linn. It. W. Goth. 166. t. 4.)

β. *Fucus marinus*, seu *Alga marina* graminea minor; Raii Syn. 52. (Algoïdes; Mich. Ic. Ined. t. 60. f. 2.)

γ. *Fucus*, five *Alga marina* angustifolia femina; Raii Syn. 52. (Algoïdes; Mich. Ic. Ined. t. 59?)

δ. *Potamogeton marium* in utriculis epiphyllispermon minus; Raii Syn. 53.

1. *Alga angustifolia vitrariorum*; Raii Syn. 53. Leaves entire, obscurely three-ribbed. Stem slightly compressed. Native of the sea-shore, or salt muddy ditches and creeks throughout Europe, possibly of New Holland and North America also, flowering towards autumn. The root is perennial, fibrous. Stems roundish, smooth, decumbent at the base, and trailing to a great extent, throwing out tufts of fibres here and there; their branches floating and leafy, simple, a little compressed. Leaves alternate, tapering at the base into a kind of sheathing footstalk, linear, a foot, or much more, in length, flat, smooth, bluntish, quite entire, splitting longitudinally a little above the base, on the upper side, and putting forth from that fissure a linear, obtuse, flat *receptacle* or *spadix*, two inches long, covered in front with a series of naked flowers. Each of these flowers consists of a green anther, and a pistil of the same hue, parallel to it; but in such an alternate order, that the anther of each flower is contrary to that of its neighbour, and stands above the pistil of the latter. The whole herb is flaccid and tender; yet Linnæus says it is used in some parts of Sweden to make a thatch, which is very durable, and likewise to stop up chinks in wooden buildings. It serves also for manure, as well as the various kinds of sea-weed.

Whether the varieties above indicated may any of them prove distinct species, must be left for future inquiry. The β is a small slender plant, differing in nothing but its lesser dimensions from the common kind. It is well represented in one of Micheli's unpublished plates. γ is larger, more compact, and branched; we can scarcely doubt its being Micheli's t. 59. Of the others we know no more than can be gathered from Ray's *Synopsis*.

Z. oceanica of Linnæus is quite different from any of these supposed varieties, constituting a distinct genus, called *Pessifonia Cavolini*, by Mr. König, in Ann. of Bot. v. 2. 95. t. 6; and well described by don Philip Cavolini of Naples, in a dissertation on these plants. De Candolle has named it *Caulinia*, but it is not Willdenow's. In Micheli's unpublished figures above cited, t. 58, is a good figure of this. We never met with any authority for its being a native of the British coast; but Mr. Horner, in a paper published by the Geological Society, in their Transactions, v. 3, mentions the submarine remains of a forest, on the Suffex coast, in the brown vegetable earth, accompanying which are found fragments of a plant, whose leaves were thought by Mr. Brown to resemble *Zoster marina*, except that, being much broader than usual, he suspected they might belong to *Z. oceanica* above-mentioned. If these leaves were sufficiently perfect to exhibit the three ribs, that question might perhaps be determined. As to the breadth, or size, of the leaves

in this whole tribe, nothing is more variable. We have *Z. ciliata* of Vahl; to which he attributes *leaves* an inch or more in breadth: whose *leaves*, in our different specimens, are but one-third or one-fourth of an inch wide, and from three inches to eight inches long. *Z. marina* differs with us from one-eighth to one-fourth of an inch in width, and if the above synonyms be all right, its variations are still greater.

Z. uninerwis. Single-ribbed Grass-frack. Forst. Egypt- Arab. 157. Vahl n. 2. Willd. n. 2.—“Leaves entire, single-ribbed. Stem compressed; swelling at the joints.”—Found by Forskall on the coast of the Red sea at Mocha, growing under water, and resembling overflowed grass. The stem is yellow, with bent joints. Leaves a span long, or more, narrower than in *Z. marina*, with an obscure mid-rib, unattended by lateral ones; and their base is sheathing.

Z. ciliata, Vahl n. 3; and *Stipulea*, his n. 4; found by Forskall at the same place as the last, with whole fructification Vahl was, in both instances, unacquainted, are referred by Mr. König, in Ann. of Bot. v. 2. 97, not without some doubt, to a new diocious genus, denominated *Thalassia* in Dr. Solander's MSS., of whose fructification no figure has appeared, and of which the male flowers only have been observed. They are indeed sufficiently remarkable, as the following characters evince. *Sheath* single-flowered, of one leaf, in two oblong obtuse segments. *Perianth* of three ovate-oblong, obtuse leaves. *Cor.* none. *Filaments* none. *Anthers* nine, converging, linear-lanceolate, shorter than the calyx. The want of a slit in the *leaves* of these two last-mentioned plants proves them to be no *Zosteræ*.

ZOTENBERG, in *Geography*, a mountain of Silesia, in the principality of Schweidnitz, on which is a celebrated chapel; 20 miles W. of Breslau.

ZOTHECA, among the *Ancients*, the place where the animals designed for sacrifice were kept.

ZOUF, in *Geography*. See GAUR.

ZOUR, a river of Grand Bucharia, which runs into the Dehafs, 45 miles S. of Balk.

ZOU-KEOU-KIAOU, a town of China, in Pe-tcheli; 5 miles S.W. of Peking.

ZOULNOUN, a town of Asiatic Turkey, in the government of Sivas; 10 miles S.S.W. of Amafreh.

ZOUR EL HAMMAN, or *Island of Pigeons*, a small island in the Mediterranean, near the coast of Algiers. N. lat. 36° 26'. E. long. 12° 38'.

ZOUR, *Shabr e*. See SHAREZUR and SOLYMANIA.

ZOWAMORE, or ZIMBRA, an island in the Mediterranean, near the N.E. coast of Tunis, called by the ancients Ægimurus; 18 miles N.N.W. of Cape Bon. N. lat. 36° 50'. E. long. 11° 8'.

ZOWHAREEN, a town of Africa, in the kingdom of Tunis; 16 miles E.S.E. of Keft.

ZOW-WAN, or ZAGWAN, a town of Africa, in the kingdom of Tunis. It is a small flourishing town, built upon the north-east extremity of a conspicuous mountain of the same name. It is in great repute for the dyeing of scarlet caps, and the bleaching of linen; great quantities of both being daily brought thither for that purpose from Tunis, Sufa, and other places. The stream which is employed at present for this use was formerly, together with the river Zungler, conveyed to Carthage; and over the fountains of it there was a temple erected, the ruins of which continue likewise to this day; upon this ancient gate, which regards the south-east, there is a ram's head, armed, in basso relievo, with AUXILIO, in large letters, below it. This may, perhaps, instruct us, that Zow-wan, or whatever was its former name, was under the immediate influence and

protection of Jupiter Ammon; 36 miles S.W. of Tunis. N. lat. 36° 14'. E. long. 10° 6'.

ZOXO, a town of Asiatic Turkey, in the government of Diarbekir; 20 miles S.S.E. of Kerkifch.

ZOYSIA, in *Botany*, was so named by the late professor Willdenow, in honour of the baron Charles de Zoys, a dignified ecclesiastic, resident in Carniola, who has long pursued with ardour the investigation of the botanical treasures of that country, and who is celebrated by Hoff, Wulfen, Jacquin, and other eminent writers, for the assistance which he has at various times afforded them.—“Willd. in Nov. Act. Nat. Cur. Berol. v. 3. 440.” Brown Prodr. Nov. Holl. v. 1. 208. (“Matrella; Perf. Syn. v. 1. 73.”)—Clafs and order, *Triandria Digynia*. Nat. Ord. *Gramina*, Linn. Juss.

Gen. Ch. *Cal.* Glume of one valve, single-flowered, ovate-oblong, compressed, cartilaginous, smooth, rigid, keeled, incurved, gaping at the apex of one edge; convex on one side; flattish on the other. *Cor.* Glume of two thin, membranous valves, enclosed within the calyx, awnless. Nectary none. *Stam.* Filaments three, capillary, short; anthers hastate. *Pist.* Germen superior, linear, minute; styles two, the length of the calyx; stigmas prominent, feathery. *Peric.* none, except the permanent glumes. *Seed* solitary, linear, invested with the calyx and corolla.

Efl. Ch. Calyx of one valve, single-flowered, compressed, cartilaginous. Corolla of two membranous valves, within the calyx. Stigmas feathery. Seed linear, invested with the glumes.

1. *Z. pungens*. Sharp-pointed Zoysia. Willd. as above. Brown n. 1. (*Agrostis Matrella*; Linn. Mant. 185. Willd. Sp. Pl. v. 1. 366. “Matrella juncea; Perf. Syn. v. 1. 73.”)—Gathered in sandy ground, on the coast of Malabar, by König; and near Port Jackson, New South Wales, by Mr. Brown. This is a small perennial grass, with a creeping root, enveloped in sheathing furrowed scales. *Stems* alternate, ascending, slender, thread-shaped, simple, leafy, three or four inches high. *Leaves* two-ranked, spreading, involute, sharp-pointed, smooth, an inch or an inch and a half long, with pale, furrowed, close *sheaths*, concealing the joints of the stem. *Stipula* of several spreading hairs. *Glusters* terminal, solitary, quite simple, of ten or twelve nearly sessile, alternate, erect *flowers*, remarkable for their smooth ivory-like *glumes*, about two lines in length, out of which, at the tip, project the feathery *stigmas*.

Linnaeus was inclined to make this a distinct genus by the name of *Matrella*; derived from *matrix*, and alluding to an anatomical resemblance, too obscure to be very instructive, if it were liable to no other objection. Such allusions were allowable enough while botany remained the abstruse study of philosophers and physicians; but in proportion as it becomes general and popular, they are either useless or censurable. This grass might be forced into *Agrostis* as the definition of that genus stood in Linnaeus, but has certainly no natural habit, nor any precise character, in common therewith. Mr. Brown remarks, that the *corolla*, (his *perianthium*;) is inverted, or contrary to the single-valved *calyx*; on which account, added to the nearly spiked *inflorescence*, he ranges *Zoysia* near *Rottböllia*. We cannot but think it rather more related to *Panicum Daibylon* of Linnaeus, Haller's *Digitaria*; though in fact so distinct in its nature, as not to associate well with any thing.

ZOZONISIUS, in *Natural History*, a name of one of the gems of the ancients, but of which our accounts are so short, that we can make no conjecture of what it was. Pliny only tells us, that it was found in the river Indus, and used by the magi.

ZRATSCHE, in *Geography*, a town of Bohemia, in the circle of Czaflau; 16 miles S.W. of Czaflau.

ZRIN, a town of Croatia, near the river Unna; 40 miles E.S.E. of Carlstadt. N. lat. 45° 16'. E. long. 16° 55'.

ZSCHOPA. See TSCHOPA.

ZSCHORLAU, a town of Saxony, in the circle of Erzgebirg; 10 miles S.S.E. of Zwickau.

ZŠOKEN, a town of Saxony, in the circle of Erzgebirg; 8 miles N.W. of Grunhayn.

ZUAQUI, a town of New Mexico, in the province of Sonora; 8 miles S.S.E. of Pitquin.

ZUATA, a town of New Grenada; 45 miles N.N.E. of Tunja.

ZUBETH, a town of Persia, in the province of Chufistan; 105 miles N.W. of Sufter.

ZUBIA, a town of Spain, in the province of Grenada; 4 miles S.E. of Grenada.

ZUBTZOV, a town of Russia, in the government of Tver, on the Volga; 68 miles S.W. of Tver. N. lat. 55° 46'. E. long. 34° 50'.

ZUCARELLO, a town of Genoa; 7 miles N.N.W. of Albenga.

ZUCCAGNIA, in *Botany*, so named by the late abbé Cavanilles, in honour of Dr. Attilius Zuccagni, superintendent of the garden at Florence.—Cavan. Ic. v. 5. 2. Poiret in Lamarck Dict. v. 8. 875.—Clafs and order, *Decandria Monogynia*. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Jul.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, coloured; tube turbinate; limb in five deep, oblong, obtuse, permanent segments, the lower one a little the longest. *Cor.* Petals five, obovate, inserted into the calyx; the uppermost broadest, vaulted. *Stam.* Filaments ten, awl-shaped, ascending, hairy in their lower part, about as long as the corolla; anthers roundish, of two lobes, divided by a furrow. *Pist.* Germen superior, roundish, compressed; style capillary, of the length and position of the itamens, smooth; stigma funnel-shaped. *Peric.* Legume ovate, oblique, compressed, hairy, of one cell and two valves. *Seed* solitary, ovate, compressed, attached by its stalk to the summit of the legume. *Cavanilles*.

Eff. Ch. Calyx bell-shaped; its limb in five permanent segments. Petals five, obovate; the upper one broadest, vaulted. Legume of one cell and two valves. *Seed* solitary.

1. *Z. punctata*. Dotted Zuccagnia. Cavan. as above, t. 403. Poiret n. 1.—Native of hills in Chili, between *Portillo* and the springs commonly called *Manantiales*, bearing flowers, as well as seed, in January. It was communicated to the author by Louis Née, to whose discoveries in South America and New Holland his *Icones* are so much indebted. The stem is shrubby, four or five feet high, with numerous, twisted, glutinous branches. Leaves alternate, abruptly pinnate, of numerous, alternate, sessile, elliptical, entire, glutinous leaflets, each one-third of an inch long, marked on both sides with blackish resinous dots. *Clusters* terminal, solitary, simple, of several rather small flowers. *Partial stalks* one-third of an inch long, each with a little acute bractæ at its base. *Calyx* smooth, reddish-brown, rather shorter than the corolla. *Petals* a line and a half long, saffron-coloured, with darker veins. *Anthers* deep orange. *Legume* about three lines in length, clothed with long rusty hairs. *Seed* of a shining brown. This pretty shrub does not appear to have been raised in the gardens of Europe.

ZUCCARO, or ZUCCHERO, TADEO, in *Biography*, was a painter of considerable renown, born at S. Agnolo in

Vado, in the duchy of Urbino, in 1529. His father Ottaviano Zuccaro was also a painter, but of moderate talents; and Tadeo was principally indebted to Pompeo de Fano for initiation in the art. Having, as he imagined, exhausted the store of information to be derived from his preceptor, animated by love of his art and a desire to free his father from further charge on his account, he, at the age of 14, went to Rome, unknowing and unknown. His relation Francesco d'Agnolo was then engaged painting, with Pierino del Vaga, the grotesques of the Vatican, and he had some hope of assistance from him; but his application was vain, and he was obliged to earn his daily bread by grinding colours in different shops, wherever he could find employment. He divided his time between this labour and copying from the works of Raphael, in the Palazzo Ghigi particularly, and was often compelled to sleep under the loggie of the palace, being unable to procure better accommodation. Weary at length of so much misery, he returned to his father, but soon left him to revisit the great emporium of art. Fortune now began to smile upon him; he became known to an artist named Giacomone, and having improved much with him, and acquired some credit, his relation Francesco d'Agnolo noticed him, and for a time they worked together. Afterwards he was engaged by Daniello da Parma, a scholar of Correggio and Parmegiano, to assist him in painting a chapel of Santa Maria, in a church at Vitto, in Abruzzo. The work was in fresco, and Zuccaro, according to Vafari, painted a large portion of the subjects required. When this was done, he returned to Rome, and was employed by G. Mattie to paint a façade of the Palazzo Mattei in fresco, where he executed, in chiaro oscuro, nine historical pieces relative to the history of Furio Camillo. He was then only 18, and the execution of them was a matter of surprize to all who saw them. By this his first public work he gained so much reputation, that he soon acquired considerable employment. The duke d'Urbino, hearing of his fame, sent for him to Urbino, and gave him a commission to paint in fresco the chapel of the Duomo there, which was delayed by various causes, and he returned to Rome in the time of Julius III., who employed him, under Vafari, in the Vatican, to paint in a frieze the labours of Hercules, which were afterwards destroyed by pope Paul IV. to make room for other works. Hitherto he had been principally employed upon ornamental subjects, but now a serious one was entrusted to his pencil; and he painted in fresco, for the church of Santa Maria della Consolazione, several subjects of the passion of the Saviour, which are regarded as among his best productions. He was afterwards called upon to exert his skill, by the cardinal Farnese, in the Palazzo Caprarola. This is his greatest work, and is that whereon his reputation most depends. He was liberally paid by the cardinal. The whole ornamental part of the building was entrusted to his care, and he laboured with great earnestness to make it honourable to himself and pleasing to his employer. It has been engraved by Prener in a set of 45 plates. Tadeo Zuccaro died at Rome in 1566.

ZUCCARO, FEDERIGO, was a younger brother of Tadeo just mentioned, and born in 1543. He received his instruction from his brother, with whom he was placed at Rome, when very young, and who paid him the most affectionate attention. He soon rendered himself useful to Tadeo in his great works, and engaged also in some labours for himself. Pope Pius IV. employed him, in conjunction with F. Barroccio, in the Palazzo Belvidere, where he gained great reputation. The brothers continued to work together without rivalry, and co-operated at the Vatican and the

Villa Farnese. He was invited to Florence by the grand duke to finish the cupola, left imperfect by Vasari, and succeeded in pleasing his employer.

Gregory XIII. engaged him to paint the vault of the Capella Paolina; but having some dispute with the officers of his holiness, he avenged himself by a satirical picture which he exhibited. By this the pope was offended, and Zuccaro was obliged to fly, and leave his great work unfinished. He took refuge in France, where he was sometimes employed by the cardinal of Lorraine; and from thence he went to Flanders, where he painted cartoons for tapestries.

In 1574 he visited England, and was received very favourably. Here he painted portraits. The queen fat to him, and many of the nobility. How long he remained here is not exactly known. When he returned to Italy, he went to reside at Venice, where the patriarch Grimani employed him in his chapel to finish the fresco ornaments begun by Battista Franco, and he added some designs of his own to them. He also painted there a large picture of the Adoration of the Magi. In conjunction with the great masters then living in Venice, he was employed in the hall of the grand council of that city, and he obtained as his reward the honour of knighthood. He soon after returned to Rome, and the pope not only overlooked his indiscretion, but allowed him to complete the work he had begun in the Capella Paolina.

On the accession of Sixtus V. he was invited to Madrid by Philip II. to adorn the walls and ceilings of the Escorial; but though he painted with his usual skill, and covered immense quantities of space, he had not his usual success in affording pleasure to his patron. Philip was not gratified with his works, and Zuccaro was dismissed; not, however, without being munificently rewarded for his labours. The works he left behind him were afterwards covered over by others from the hand of Pellegrini Tibaldi. On his return to Rome he established the academy of St. Luke, for which he received letters patent from Gregory XIII., and to which, at his death, which happened in 1609, he bequeathed all his property.

The talents of the Zuccaros were more splendid than great. They designed and executed with facility; but aiming at grandeur, fell into manner; and the vice of mannerism touches also the colour and chiaro oscuro of their productions. Sometimes happy in all parts, but more frequently defective in the principal one of expression and feeling, their works please without gratifying; and though they attract, do not absorb the spectator.

ZUCCHABARI, CHADARA, in *Ancient Geography*, a town of Mauritania Cæsariensis, situated on the left bank of the river Chinalaph, and towards the north-east of mount Zalacus. This is very probably the Succabar and Colonia Augusta of Pliny.

ZUCCHARA, ZUNG-GAR, an ancient town of Africa, and the most northerly of those which lay between Zingitania and Biracium. Its magnificent ruins and its temple are the coverts of Arabs.

ZUCCHERELLI, FRANCESCO, in *Biography*, a very pleasing landscape painter, was born at Pitigliano in Tuscany, in 1702. He for some time attempted history, but abandoned it, and adhered solely to landscapes, which he adorned with very agreeably composed groups of figures. In 1752 he visited England, where he was much encouraged; but our greatest debt to him is due for his having persuaded Wilson to adopt landscape for his object, instead of portrait. For this liberal act what adequate thanks can be offered to his memory? At the foundation of the Royal Academy

he was chosen an original member. After remaining here twenty years, he returned to Italy, and settled at Florence, where he had the misfortune to be reduced to indigence, by the suppression of a monastery where he had lodged the money he had acquired. He again resumed the pencil to support himself, and died at Florence in 1788, aged 86.

ZUCCO, in *Geography*, a town of Italy, in the county of Friuli; 5 miles N.W. of Friuli.

ZUCCORA, a river of European Turkey, which runs into the Morava, near Nissa.

ZUCHABARUS, in *Ancient Geography*, a mountain of Africa Propria, in which the river Cyniphus and the fountain Acaba have their source. Herodotus called it "Charitum Mons."

ZUCHIS, a lake of Africa Propria, which is, according to Strabo, 400 stadia in circuit; and on the bank of the lake is a town of the same name.

ZUCHOW, in *Geography*, a town of Poland, in Volhynia; 32 miles E. of Lucko.

ZUCKMANDEL, a town of Silesia, in the principality of Neisse, the see of a bishop; 17 miles N.N.W. of Jagerndorf. N. lat. 50° 8'. E. long. 17° 16'.

ZUCKTOK, a town of Mexico, in the province of Yucatan; 80 miles S. of Campeachy.

ZUDA, a town of Arabia, in the province of Yemen; 12 miles W. of Chamir.

ZUDISHTIRA, in *Hindoo Mythology*, is one of the heroic sons of Pandu, whose wars and adventures occupy a considerable portion of the Mahabarat, an epic poem of great celebrity in the Shanfcrit language. See MAHABARAT and SHANSKRIT.

ZUECA, in *Geography*. See GIUDUCCA.

ZUELA, ZULA, or *Zavula*, a considerable town of Africa, in the kingdom of Fezzan, said to have been anciently the capital, containing many rich merchants, situated in a fertile country. The remains of ancient buildings in this town, the number and size of the cisterns, and the construction of the vaulted caves, intended perhaps as repositories for corn, exhibit such vestiges of ancient splendour, as will probably attract, and may highly reward, the attention of the future traveller; 60 miles E.N.E. of Mourzouk. N. lat. 27° 35'. E. long. 16° 45'.

ZUENGA, a town of Thibet; 176 miles W.S.W. of Lassa. N. lat. 28° 32'. E. long. 88° 10'.

ZVENIGOROD, a town of Russia, in the government of Moscow, on the Moskva; 28 miles W. of Moscow. N. lat. 55° 40'. E. long. 35° 34'.

ZUENZIGA, a desert district of Africa, in the country of Sahara, situated to the south of Taflet.

ZVERINOGOLOVSKAIA, a fort of Russia, on the Tobol; 52 miles S. of Okunevsk.

ZUEVA, a town of Russia, in the government of Irkutsk, at the union of the Kotoi and the Angara; 60 miles N.N.W. of Irkutsk.

ZUF, a town of the country of Candahar; 50 miles N.W. of Candahar.

ZUFFERABAD, a town of Hindoostan, in the subah of Moultan, near the Ravee; 25 miles N.E. of Moultan.

ZUFFIRWAL, a town of Hindoostan, in Lahore; 10 miles N.N.E. of Sealcot.

ZUFFOLO, in the *Italian Music*, a little flute or flageolet, having a very shrill sound, like the whistling of small birds.

ZUF-FOONE, or *Mers el Fulom*, in *Geography*, a seaport of Algiers; 36 miles W.N.W. of Boujeah.

ZUG, a canton of Switzerland, bounded on the north and

and east by Zurich, on the south by Schweiz, and on the west by Lucerne; only about ten miles long, and nearly as much in breadth. The pastures here are excellent, and it produces also a sufficiency of grain, with plenty of fruit, and some wine. On one side of the Zug lake, the country is covered with chefnut-trees, which form a very profitable branch of trade, by the sale of the nuts to the neighbouring countries. This district, on the extinction of the counts of Lenzburg, devolved to those of Kyburg, which latter also failing, it came to the counts of Habburg, and in them to the house of Austria, towards which it always manifested an inviolable attachment; but in the year 1351, the town of Zug being besieged by the Helvetic confederacy, and not only neglected by the archduke, but even recommended by him to surrender, it followed his advice, and was admitted into the confederacy, to which its territory had previously acceded. The generosity of the conquerors rivalled the courage of the vanquished; for, in consequence of their submission, the canton of Zug was rescued from the yoke of a foreign master, obtained liberty and independence, and was admitted into the Helvetic confederacy upon equal terms. This canton is the seventh in rank, and among the lesser ones the fifth; besides which, it is in a particular manner connected with Lucerne, Uri, Schweiz, and Underwalden, commonly called the five territorial confederates. The government of this little canton is exceedingly complicated; and the inhabitants of the town have somewhat more influence, and enjoy a greater share in the administration of affairs, than those of the capital burghs in the five other democratical cantons. The supreme power resides in the inhabitants of Zug, Bar, Egeri, and Meutzingen, who assemble yearly to enact laws, and choose their magistrates. The landamman, reciprocally elected from each of the four districts, continues three years in office when taken from Zug, and but two years when chosen from each of the three other districts. The general administration of affairs is entrusted to the council of regency, composed of forty members, of whom thirteen are supplied by the district of Zug, and twenty-seven selected equally from the three remaining communities. This council, as well as the landamman, resides always in the capital. Zug was the only one of the small cantons which did not send its contingent to the army, but made a shew of resistance to the imposition of the new constitution. On the 29th of April, Zug was invested by French troops, surrendered on the 30th, and on the 1st of May accepted the new constitution. The people of this canton are reckoned the most restless of Switzerland: their general assemblies are often tempestuous, though seldom attended with bloodshed.

ZUG, a town of Switzerland, and capital of the above described canton, is beautifully situated at the north-east extremity of a lake, in a fertile valley, abounding with corn, pasture, and wood. It contains two churches, a convent, a town-house, arsenal, corn-magazine, a college, hospital, &c. The titular saint of this place is Oswald, king of Northumberland in the seventh century, who was defeated and slain in 624 by Peuda, king of the Mercians. In the church is his statue, with this inscription: "Sanctus Oswaldus Rex Angliæ Patronus hujus Ecclesiæ." This king was much renowned for his charity, piety, and power of working miracles; 15 miles S. of Zurich. N. lat. 47° 6'. E. long. 8° 16'.

ZUG, a lake of Switzerland, eight miles long, and two wide, abounding in fish. It receives its name from the town on its coast.

ZUGANA, in *Ancient Geography*, a town in the interior of Arabia Felix. Ptol.

ZUGAR, a town of Africa Propria, between the rivers Bagradas and Triton.

ZUGARI, in *Geography*, a town of Naples, in Calabria Ultra; 6 miles N. of Nicotera.

ZUGLIANO, a town of Italy, in Friuli; 4 miles S. of Udina.

ZUHREE, a district of the province of Balouchistan, or Ballagistan, which is considered by some as a province distinct from Mekran or Mecran, and by others as the northern division of it. However this be, Balouchistan is a confused mass of tremendous mountains, affording pasture nevertheless for numerous flocks of sheep and herds of cattle, and producing great quantities of wheat. The territories of its chief comprehend all the countries that lie between 20° 30' and 30° N. lat., and from 65° to 69° E. long.; and Balouchistan is divided into the two mountainous provinces of Ithalawam and Sarawan, the low country of Cutch Gandava to the east, and the provinces of Zuhree and Anund Dajal, to which may be added the small districts of Sbat and Miltung, lying north of Kelat. Zuhree, though it is entirely subject to the khan of Kelat, pays very little to him, as its revenues are enjoyed by Zadir Bukht, of the Zuhree tribe of Balouches. The chief town is Zuhree, which contains from one to two thousand houses. The second town, nearly as large, is Dadur; besides which, there are many populous villages; and upon the whole, this is spoken of as the most civilized part of Balouchistan, the capital of which is Kelat.

ZUIA, a river of Spain, which runs into the Guadiana, a little above Medellín.

ZUICK, a town of Prussia, in Natangen; 8 miles N.W. of Lick.

ZUILA. See ZUELA.

ZUINGLE, or ZWINGLE, ULRIC, in *Biography*, the Swiss Reformer, was born January 1, 1484, at the village of Wildhauen, in the county of Tockenbourg; and having discovered in his youth a studious disposition, was intended by his father for the church. Accordingly he was sent for education first to Basil, and then to Berne, where attempts were made to fix him in the convent of the Dominicans; but in order to prevent their taking effect, his father removed him to the university of Vienna, which was then in high reputation. Returning from thence to Basil, he was chosen classical tutor in his 18th year, where he made very considerable advances in knowledge, and particularly in that of the profession to which he was destined, whilst he taught others; availing himself of the lectures of Thomas Wyttembach, who, without renouncing the system of the schools, allowed his pupils to think freely for themselves. After a residence of about four years at Basil, Zuingle took the degree of M.A., and being chosen pastor of Glarus, was ordained by the bishop of Constance. Having commenced a course of liberal inquiry, he indefatigably pursued it, critically examining the New Testament as the directory of his faith, and consulting a variety of writers who had incurred the censure of the church of Rome. The consequence of this mode of study was a discovery of the deviation of the ecclesiastical system, generally adopted and established, from that of Christianity, both in doctrine and practice. But he was slow in publishing the theological sentiments which he had imbibed, and for ten years pursued a course of practical instruction at Glarus, which secured to him the respect and affection of his parishioners, so that the bigotted clergy could not succeed in their attempts to do him injury. From Glarus he removed to the celebrated abbey of Einsideln, where he accepted the office of preacher, and where he had an opportunity of associating

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with persons of learning, and of contributing to the education of candidates for the ministry. Whilst he was at Glarus he exposed several superstitious of the church of Rome; and at Einsidlin he gained additional reputation by preaching against vows, pilgrimages, and offerings. Here he employed his influence to effectually, that he ordered the inscription over the abbey-gate, "Here plenary remission of sins is obtained," to be effaced, and the relics to be buried; and, among other rules which he established in a convent of females under his direction, he introduced one for obliging the nuns to read lessons in the New Testament, instead of reciting their hours. He was also intrepid and zealous in propagating rational sentiments of religion, and with this view he availed himself of a public occasion, when a crowd was assembled, to deliver a sermon designed to shew that no superior sanctity resided in any place so as to confer peculiar merit on vows addressed from it, but that their acceptance depended upon the purity of the heart and life of the worshipper. Declarations of this kind, whilst they gained the approbation of some of his auditors, excited the indignation of others, and alarmed the monks of this and neighbouring convents. Although he was regarded with jealousy and terror by those whose interest led them to oppose reformation, he was so much respected, that his ecclesiastical superiors manifested no displeasure against him; and by his correspondence with Erasmus, Glareanus, Hedio, Rheanus, and other learned persons, he established a reputation which enabled him to encourage liberal studies. In 1518 he was invited to occupy the vacant post of preacher in the cathedral of Zurich, and before he was installed he announced his proposed plan of preaching, which differed from that which had been before practised, and which gave him an opportunity of explaining the books of the New Testament in an uninterrupted series, without regard to texts that were marked for each Sunday and Saint's-day in the year. This plan was approved by the majority of the chapter, and drew together a crowded auditory, who expressed in high terms their admiration of the preacher. A circumstance occurred which afforded him a complete victory over an emissary of pope Leo X., who was employed in the sale of indulgences, inasmuch that he was obliged to quit the city and retire into Italy. Some writers, especially among the Catholics, have referred the origin of the reformation, and of the opposition of both Zuingle and Luther to the papal authority, to the disputes about indulgences; but, although this quarrel might have contributed to the promotion of it, the people were previously prepared for the event by the preaching and conduct of Zuingle, and by the judgment and prudence with which he had planned and pursued his measure for this purpose. Luther proceeded very slowly to that exemption from the prejudices of education, which Zuingle, by the force of an adventurous genius, and an uncommon degree of knowledge and penetration, easily got rid of. And we learn from the most authentic records of history, that he had explained the Scriptures to the people, and called in question the authority and supremacy of the pope, before the name of Luther was known in Switzerland. In process of time, after Luther had taken up arms against Rome, Zuingle, being then minister of the chief church in Zurich, concurred with him; preaching openly against indulgences, then against the intercession of the saints, then against the mass, the hierarchy, the vows and celibacy of the clergy, abstinence from flesh, and also many things which Luther was disposed to treat with toleration and indulgence; such as images, altars, wax-tapers, the form of exorcism, and private confession, &c. Zuingle, at an early period of his ministry, had declared his decided

difapprobation of all wars, excepting those that were undertaken for the defence of the country; and such was the influence of his opinion, that the canton of Zurich refused to concur with the other cantons in a subsidiary treaty with the French king. The result of his arguments and remonstrances to this effect was a law passed by the assembly of the canton in 1522, abolishing all alliances and subsidies for the term of 25 years. He laboured at the same time to enforce a regard to the rules of the gospel in preference to the respect that was generally manifested to those of ecclesiastical discipline. Accordingly he defended those persons who had been denounced to the magistrate for infringing on the "fast of Lent" without a dispensation; and published on this occasion his treatise "On the Observation of Lent," which contained free opinions on the obligation of fasting and keeping particular days. When the bishop of Constance remonstrated against his proceeding, and endeavoured by his charge and letters to excite apprehensions among the people, and in the council and chapter of Zurich, that he would spread through Switzerland such a flame as Luther had kindled in Germany, Zuingle obtained permission to reply; and composed a tract to prove that the gospel alone is authority from which there is no appeal, and that the decisions of the church are binding only inasmuch as they are founded on Scripture. When the bishop of Constance had prevailed with the deputies of the Helvetic diet to order the arrest of a pastor accused of preaching the "new doctrine," Zuingle, who had now adopted and openly avowed the principles of the reformation, addressed to the heads of the cantons, in his own name and that of his friend, a summary of his doctrine, annexing an intreaty that they would allow liberty for the preaching of the gospel. In a conference before the deputies of the bishop of Constance, in the presence of the great council of Zurich, held in 1523, Zuingle gave an account of his doctrine; and the colloquy terminated in the following declaration of the council: "That Zuingle, having been neither convicted of heresy, nor refused, should continue to preach the gospel as he had already done; that the pastors of Zurich and its territory should rest their discourses on the words of Scripture alone; and that both parties should abstain from all personal reflections." Zuingle, having been thus supported by the magistrates, and having obtained a public sanction of the principles of the reformation in this canton, has been charged, both by Catholics and Protestants, with allowing to the secular power an undue degree of authority in ecclesiastical matters; however it has been urged in his defence, that he did not intend to transfer to government the absolute power over consciences claimed by the popes; but that, for the preservation of order and tranquillity, he thought that the depositories of lawful authority ought to have a share in the direction of ecclesiastical affairs. Zuingle, though thus supported, proceeded with caution in promoting alterations in the ceremonies and modes of public worship, and was principally anxious to lay a proper foundation of change by enlightening the understanding and convincing the judgment of the people. When some zealous reformists instigated a mob to pull down a crucifix that had been erected at the gate of the city, and the culprits were brought before the council to be tried and punished, Zuingle interposed; and whilst he vindicated the offenders from the charge of sacrilege, he gave it as his opinion, that they deserved some punishment for having pulled down the crucifix without the authority of the magistracy. This dispute led to a general colloquy, which was held in October 1523; and the result was, that all the culprits, except Hottinger their ring-leader, and the person who had actually

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tually committed the offence, were set at liberty; but Hottinger was banished from the canton for two years; and he was afterwards put to death for heresy, in consequence of a sentence pronounced by the deputies of seven cantons at Lucerne, notwithstanding the intercession of Zurich. The question of the celibacy of the clergy was agitated in these colloquies, and though no decisive opinion was given by the council, several clergymen married, and among them was Zuingle himself, who had expressed his sentiments against the question, at the age of 40. In 1524, the council of Zurich proceeded to the reformation of public worship according to the plan proposed by Zuingle. They began with causing all pictures and statues to be removed by those whose ancestors had consecrated them; and of these several were destroyed. These measures occasioned alarm and complaint in the other cantons; and acts of hostility were meditated. Without entering into a detail of the various circumstances that occurred on one side and on the other, we shall content ourselves with observing, that fanaticism and bigotry were engaged in opposition to each other, and produced in Switzerland effects similar to those that have attended innovation and reformation in other countries. At Zurich, the total subversion of the Romish worship was accomplished, by prohibiting processions and other ceremonies, and by the abolition of the sacrifice of the mass. The latter event took place by the activity of Zuingle in 1525; and on Easter Sunday the Lord's Supper was celebrated according to his idea of this rite, which was that of a merely commemorative and symbolical service. Our reformer displayed in another instance a disinterested spirit, which reflects great honour on his memory. Although he was one of the canons who composed the chapter of the cathedral, and this body was independent of the council, and possessed its own jurisdiction and property, he prevailed with the majority of his colleagues to consecrate the large revenues of the chapter to establishments for public instruction, and to transfer its temporal power to the government. In the conduct of this event he manifested no less wisdom and moderation than disinterestedness; for the chapter charged itself with the payment of as many pastors as were necessary for the public worship of the city, to which service those canons who were capable of service were devoted. Those who were old and infirm were allowed to preserve their benefices for life; and their revenues, as they became vacant, were to be employed in founding professorships for lectures, to which admission was to be gratuitous. These liberal conditions were religiously observed, and the regulations thus framed are still continued at Zurich. The orders of mendicants, and other religious houses, were abolished; and their revenues were appropriated to the support of hospitals, and other charitable institutions, as the old members dropped off. Zuingle was afterwards commissioned to organize a system of public instruction, in which he displayed a cultivated and liberal mind.

The reputation which Zuingle had acquired, and the success which had crowned his plans and labours in the cause of reformation, were not sufficient to secure him against the prejudices of fanatics, and the hostile attacks of malignity. Attempts were made to associate him with Munzer, one of the leaders of the Anabaptists; but he happily avoided the snare that was laid for him, and instead of taking part in those violences which called forth the interposition of the civil power, and which terminated in the death of one of the persons concerned, he did all that lay in his power to prevent them; and though he could not preserve the life of one disturber of the public peace, he composed the tu-

mult occasioned by the intemperate zeal of others. Notwithstanding the singular prudence and moderation which influenced his whole conduct, his reputation excited envy, and a conspiracy was formed against his life. Under the protection of the magistracy of Zurich he was safe; but his enemies insidiously proposed a conference at Baden, in Argovia. His friends, however, were not unapprised of his danger, and well knowing that the cantons were actuated by inveterate hostility against his person as well as his doctrines, they would not consent to his leaving Zurich. At the conference, which he prudently declined to attend, enmity was avowed both against him and his adherents. Some of the cantons, however, withheld their concurrence; and this was particularly the case with respect to the canton of Berne. In this canton, the reformation had made considerable progress, so that in 1527 several of its municipalities addressed the senate for the abolition of the mass, and the introduction of the form of worship established at Zurich. The reformers at Berne summoned a convocation, to which the clergy of the other Helvetic states, and the neighbouring bishops, were invited. Zuingle's attendance was also requested; and he thought it his duty to appear in that assembly, professedly convened for the advancement of the reformation. Haller was the leader of the party in this canton, and in connection with Zuingle and other coadjutors the cause to which they were devoted obtained a complete triumph; so that the grand council of that canton fully adopted the measures of that of Zurich. Upon this, five of the cantons which were attached to the old religion entered into a solemn engagement not to suffer the doctrines of Zuingle and Luther to be preached among them. At length the hostilities that subsisted between the Catholic and reformed cantons were amicably terminated by the treaty of Cappel in 1529. The animosity, however, between these cantons was not extinguished. It broke out again with greater violence than ever; and the senate of Zurich has been charged with the first aggression, by arbitrary acts in favour of the reformed preachers in the common bailiages. Its project of secularizing the abbey of St. Gall, which belonged to the Helvetic confederacy, was a greater grievance; and on the other hand, the five associated Catholic cantons refused to concur with the others in expelling the Spaniards from the Valtelline, and persecuted the reformed in their jurisdictions with the greatest severity. The sufferers fought the protection of Zurich, and the eloquence of Zuingle was employed in recommending their cause to the senate. The breach widened, and a majority of the Protestants agreed in stopping the transit of provisions to the five cantons, which depended upon foreign supplies. Zuingle in vain remonstrated against this cruel act; and the five cantons took up arms, and having published a manifesto, marched into the field in October 1531. A detachment was ordered to prevent the junction of the forces of Berne with those of Zurich, and the main body advanced towards Cappel. This intelligence alarmed the people of Zurich; and they could only spare 700 men for the relief of their countrymen at Cappel. Zuingle was appointed to accompany them. A battle ensued; and though the Zurichers, animated by his exhortations, defended themselves valiantly, they at length were compelled to yield to superiority of numbers, and were entirely routed. Some died at their posts; others fled; and Zuingle received a mortal wound at the commencement of the action, and fell senseless to the ground. As soon as he had recovered sufficiently to raise himself up, he crossed his arms on his breast, and lifted his languid eyes to heaven. In this condition he was found by some Catholic soldiers, who, without knowing him, offered to bring a confessor; but

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but as he made a sign of refusal, the soldiers exhorted him to recommend his soul to the holy virgin. On a second refusal, one of them furiously exclaimed, "Die then, obstinate heretic!" and pierced him through with a sword. His body was found on the next day, and the celebrity of his name drew together a great crowd of spectators. One of these, who had been his colleague at Zurich, after intently gazing on his face, thus expressed his feelings: "Whatever may have been thy faith, I am sure thou wert always sincere, and that thou lovest thy country. May God take thy soul to his mercy!" Among the savage herd some voices exclaimed, "Let us burn his accursed remains!" The proposal was applauded; a military tribunal ordered the execution, and the ashes of Zuingle were scattered to the wind. Thus, at the age of 47, he terminated a glorious career by an event deeply lamented by all the friends of the reformation, and occasioning triumph to the partisans of the Romish church.

"In the character of Zuingle," says one of his biographers, "there appears to have been united all that makes a man amiable in private society, with the firmness, ardour, and intrepidity that are indispensable in executing the great task of reformation. By nature mild, his earnestness was the result of his sense of the importance of the cause he engaged in to the best interests of mankind, not of a dogmatic or dictatorial spirit. His views were large and generous, and his opinions rose above the narrow scale of sect or party. It was no small proof of liberality in that age that he ventured to assert his belief of the final happiness of virtuous heathens, and of all good men who act up to the laws engraven on their consciences. His temper was cheerful and social, somewhat hasty, but incapable of harbouring resentment, or indulging envy and jealousy. As a reformer he was original; for he had proceeded far in emancipating himself from the superfluous of Rome by the strength of his own judgment, and had begun to communicate the light to others, whilst Luther still retained almost the whole of the Romish system, and long before Calvin was known in the world. He was more learned and more moderate than the first of these divines, and more humane and kind-hearted than the last. He wrote many works of utility in their day; and the reform, of which he was the author, still subsists unchanged among a people distinguished by their morals and mental cultivation." Life of Zuingle, by J. G. Hefs. Mosheim's Eccl. Hist. Coxe's Travels in Switzerland, vol. i. See ZUINGLIANS.

ZUINGLIANS, in *Ecclesiastical History*, a branch of ancient Reformers or Protestants; denominated from their author Ulric or Huldric Zuinglius. See ZUINGLE.

As to the eucharist interpreting *hoc est corpus meum*, by *hoc significat corpus meum*, he maintained, that the body and blood of Christ were not really present in the eucharist; and that the bread and wine were no more than external signs or symbols, designed to excite in the minds of Christians the remembrance of the sufferings and death of the divine Saviour, and of the benefits which arise from them. This opinion was embraced by all the friends of the reformation in Switzerland, and by a considerable number of its votaries in Germany. On the other hand, Luther held his doctrine, which was *consubstantiation*, with the utmost obstinacy; and hence arose, in 1524, a tedious and vehement controversy, which terminated, at length, in a fatal division between those who had embarked together in the sacred cause of religion and liberty. From this time, Zuingle propagated his doctrine concerning the eucharist in a public manner by his writings, after having entertained and taught it privately before that period. His "Commentary on true

and false Religion," containing his sentiments on this subject, was published in 1525, and followed by a learned treatise of Cœcolampadius on the same subject.

With a view of bringing this controversy, which reflected much discredit on the Protestant cause, to an amicable issue, Philip, landgrave of Hesse, invited, in 1529, to a conference at Marburg, Luther and Zuingle, together with some of the other principal leaders of their respective parties; who disputed, during four days, in presence of the landgrave. Luther attacked Cœcolampadius, and Melancthon disputed against Zuingle. Before they parted, the Swiss and German theologians signed their mutual assent to 14 articles, containing the essential doctrines of Christianity, and expressed a hope that their difference with respect to the real presence would not interrupt their harmony. The landgrave required from the two leaders a declaration that they would regard one another as brothers. Zuingle readily consented; but Luther would engage no farther than that, speaking of the Swiss, he would for the future moderate his expressions. In this conference Zuingle was accused of heresy, not only on account of his explication of the nature and design of the Lord's Supper, but also in consequence of the false notions he was supposed to have adopted relating to the divinity of Christ, the efficacy of the divine word, original sin, and some other parts of the Christian doctrine. But though he cleared himself to the satisfaction even of Luther from the greatest part of these accusations, their dissension concerning the manner of Christ's presence in the eucharist still remained. Nor did it terminate with the death of Zuingle in 1531, nor with that of Luther in 1546. Melancthon and Calvin made several attempts towards promoting a reconciliation between the contending parties. With this view Calvin proposed a system, with respect to the eucharist, more conformable to the doctrine of the Lutheran church than that of Zuingle. He acknowledged a spiritual presence of Christ in this sacrament, and supposed that a certain divine virtue or efficacy was communicated by Christ with the bread and wine to those who approached this holy sacrament with a lively faith, and with upright hearts; and to render this notion still more satisfactory, he expressed it in almost the same terms which the Lutherans employed in inculcating their doctrine of Christ's real presence in the eucharist. But whilst the followers of Zuingle asserted, that all Christians, without distinction, whether regenerate or unregenerate, might be partakers of the body and blood of Christ, Calvin confined this privilege to the pious and regenerate believer alone. Besides, the sentiments of the Zuinglians, with regard to the divine decrees, differed very little from that of the Pelagians; nor did they hesitate in declaring, after the example of Zuingle himself, that the kingdom of Heaven was open to all who lived according to the dictates of right reason; whereas Calvin maintained, that the everlasting condition of mankind in a future world was determined from all eternity by the unchangeable order of the Deity, and that this absolute determination of his will and good pleasure was the only source of happiness or misery to every individual. Moreover, Zuingle and Calvin differed in their notions of ecclesiastical government. The former ascribed an absolute and unbounded power, in religious matters, to the civil magistrate; allowing at the same time of a certain subordination among the ministers of the church, and placing at their head a perpetual president or superintendent, with a certain degree of inspection and authority over the whole body; but Calvin, on the contrary, reduced the power of the magistrate, in religious matters, within narrow bounds; declaring the church a separate and independent body, endowed with the power of

legislation for itself, and maintaining that it was to be governed, like the primitive church, only by presbyters and synods, *i. e.* by assemblies of elders, composed both of the clergy and laity, and leaving to the civil magistrate little else than the privilege of protecting and defending the church, and providing for what related to its external exigencies and concerns. These and other circumstances prevented the union of the Lutheran and reformed churches; though in process of time almost all the latter churches adopted the theological system of Calvin. *Mosh. Eccl. Hist. Eng. ed. 8vo. vol. iii. and vol. iv.*

ZULAPHA, in *Geography*. See SULAU.

ZULE, a town of South America, in the new kingdom of Grenada; 5 miles S. of Pamplona.

ZULIANA, a town of the republic of Ragusa; 30 miles W.N.W. of Ragusa.

ZULLICHAU, a town of the New Mark of Brandenburg, formerly in the duchy of Crossen. This town is the capital of a district, or circle, and the seat of an ecclesiastical inspection, situated in a low plain, half a German mile distant from the Oder, and about the same distance from the Ober. The town itself consists only of 250 houses, one parish-church, and a grammar-school; but it has four large suburbs: without the walls is a feat belonging to the king of Prussia, fortified with walls and moats, which serves for the residence of the king's receiver of the prefecturate; in this part also stands the Calvinist church. Zullichau contains a good woollen manufacture; 37 miles S.E. of Francfort on the Oder. N. lat. 52° 8'. E. long. 15° 45'.

ZULPHA, or JULFA, a town of Persia, in the province of Irak, on the S. side of the Zenderoud, about a mile and a half from Ispahan, to which it is considered as a kind of suburb: it was built by Abbas I. after he had destroyed Zulpha, in Armenia. In the year 1722 this town was taken by the Afghans, under Maghmud, who demanded of the inhabitants the sum of 70,000 tomans. This suburb has been reduced from 12,000 to 600 families, which is the case with respect to most of the others; and a person may ride for miles amidst the ruins of the immense capital, Ispahan, which nevertheless still boasts of 200,000 souls. In the suburb of Julfa, there still remain nine churches, in which weekly service is performed.

ZULPHA, or *Julfa*, a town of Persian Armenia, on the Aras or Araxes, supposed to be the ancient Arriamene. This town was taken and destroyed by Abbas I., who removed the inhabitants to Ispahan, where they built a fauxbourg, called *Zulpha*, containing 4000 houses; some families, nevertheless, returned back to their native place, and took up their residence among the ruins; 60 miles N. of Tauris.

ZULPICH, or ZULCH, a town of France. This town contains three churches, and several cloisters. In the year 406, Klodwig, king of the Franks, overcame the Alemanni near this place; 18 miles S.W. of Cologn. N. lat. 50° 43'. E. long. 6° 34'.

ZULTZ, or BIALA, a town of Silesia, in the principality of Oppeln, and capital of a circle; 20 miles S.S.W. of Oppeln.

ZULUCK, a small river of Russia, in the country of the Cossacks, which runs into the Kardaï, near Babere-zovskaia.

ZULZ, a town of the Grisons, in Upper Engadine, on the Inn; 31 miles N.N.E. of Chiavenna.

ZUM BOIRS, a town of Germany, in the county of Bregentz, on the river Bregentz; 18 miles S.S.E. of Bregentz.

ZUM Closterlin, a town of Germany, in the county of Pludentz, on the river Alfens; 9 miles E. of Pludentz.

ZUM Hoffz, a town of Germany, in the county of Bregentz, on the river Bregentz; 15 miles S.S.E. of Bregentz.

ZUM Stein, a town of the duchy of Berg; 3 miles N.E. of Blankenberg.

ZUM Vogeljang, a town of France, in the department of the Roer; 3 miles S.E. of Juliers.

ZUM Zontags, a town of Germany, in the county of Bregentz; 24 miles S.S.E. of Bregentz.

ZUMALIA, or CUMATA, a town of Spain, in the province of Guipuscoa, near the coast of the bay of Biscay; 14 miles W. of St. Sebastian. N. lat. 43° 17'. W. long. 1° 51'.

ZUMAMPA, a town of South America, in the government of Tucuman, in the Rio Dolce; 90 miles S. of St. Yago del Eitero.

ZUMELLA, a town of Italy, in the Trevifan; 10 miles N.W. of Ceneda.

ZUMIC ACID, in *Chemistry*, a name given by Dr. Thomson to a peculiar acid principle lately obtained by M. Braconnot from rice, and which that gentleman had absurdly called *Nanceic acid*, from *Nancy*, the name of the city where he resided.

This acid was obtained by fermenting rice in water by the application of a gentle heat. An acid liquor was obtained, which on evaporation to dryness left a gummy mass, having a very sour taste. This was digested in alcohol, which on evaporation let fall crystals composed of the peculiar acid and lime. The lime was thrown down by barytes, and the barytes afterwards separated by sulphuric acid, and thus the acid obtained in a separate state.

Zumic acid is colourless, has a very acid taste, and does not crystallize. It precipitates none of the metals from their solutions, except zinc from very concentrated solutions of its salts.

With potash and soda it forms incrySTALLIZABLE deliquescent salts, soluble in alcohol. With ammonia it forms a crystallizable salt.

The neutral zumate of lime crystallizes confusedly in a form somewhat resembling a cauliflower. It is opaque, very white, has little taste, and has the appearance of having effloresced.

We do not think it necessary to detail the properties of the other compounds of this acid, which have been but little examined, and appear to be totally devoid of interest.

Dr. Thomson thinks the zumic acid is the same with the lactic acid, the latter being probably disguised as usually obtained, by the presence of some animal matter.

ZUMPANGO, in *Geography*, a town of Mexico; 90 miles S. of Mexico.

ZUMAPANO, a town of Mexico; 20 miles N. of Mexico.

ZUNAC, a town of South America, in the audience of Quito; 30 miles N.W. of Macas.

ZUNAPA, a small island in the Adriatic. N. lat. 43° 7'. E. long. 17° 7'.

ZUNCOLO, a town of Naples, in Principato Ultra; 17 miles S. of Conza.

ZUNDEL, a town of Silesia, in the principality of Neisse; 5 miles S.S.E. of Grotkau.

ZUNGER, a town of Prussia, in Pomerelia, at the mouth of the Nogat; 8 miles W.N.W. of Elbing.

ZUNG-GAR, a town of Tunis, anciently called *Zuebara*. Here are the ruins of a temple, and an aqueduct erected for the purpose of conveying water to Carthage; 48 miles S.W. of Tunis.

ZURIC.

in the town constitute, in conjunction with several magistrates and other assessors, deputed by the civil power, an ecclesiastical and academical council: to this committee the deans recur in all concerns, which seem to exceed their jurisdiction: it determines lesser affairs, and refers cases of importance to the Senate.

During the French revolution, the canton of Zurich, after a feeble resistance, surrendered to the arms of the invaders; and the national assembly, which had been convoked, acceded to the new organization of the Helvetic constitution.

ZURIC, a city of Switzerland, and capital of a canton of the same name, situated on a large lake, where the river Limmat is discharged, which divides it into two parts; supposed to have been built on the site of the ancient Tigurum, which was destroyed by the Allemanni.

The environs are very delightful: an amphitheatre of hills gradually sloping to the borders of the water, enriched with pasture and vines; dotted with innumerable villages, cottages, and hamlets; and backed on the W. by the Utlberg, a bold and gloomy ridge stretching towards the Albis, and that chain of mountains which rises gradually to the Alps. Of the two parts into which the town is divided, the old part is surrounded with the same ancient battlements and towers which existed in the thirteenth century, and the suburbs are strengthened by fortifications in the modern style, but too extensive. The ditches, instead of being filled with stagnant water, are mostly supplied with running streams. The public walk is pleasantly situated in a lawn, at the junction of the Limmat and the Sihl, an impetuous and turbid torrent, which descends from the mountains of Einsidlin: two rows of lime-trees planted by the side of the Limmat, and following its serpentine direction, afford an agreeable shade in the heat of summer. The inhabitants are very industrious; and carry on with success several manufactures: the principal are those of linens and cottons, muslins, and silk-handkerchiefs. The manufacturers do not in general dwell within the walls; but the materials are mostly prepared, and the work is completed in the adjacent districts. For this reason, Zurich does not exhibit the activity and numbers of a great commercial city. The environs, on the contrary, are so extremely populous, that perhaps few districts in the neighbourhood of a town, whose population scarcely exceeds 10,000 inhabitants, contain within so small a compass so many souls. The streets are mostly narrow; the houses and public buildings accord more with plainness and convenience, than with the elegance and splendour of a capital. In 1780 the town contained 10,550 souls; but the population had decreased from the difficulty of obtaining the burgherhip; whereas luxury and opulence had very considerably increased. In general, however, the manners of the inhabitants are simple. Dinner is usually served at twelve: in the afternoon the gentlemen assemble in clubs, or small societies, in the town during winter, and at their respective villas in summer. They frequently smoke, and partake of wine, fruit, cakes, and other refreshments. The women, for the most part employed in their domestic occupations, or devoted to the improvement of their children, are not fond of visiting. This reserve, however, has much abated, and gives place to a more sociable intercourse. Such, however, is the prevalence of national habit, that a few families, which form a more agreeable mixture of company, are considered as differing from the established customs, and are still known by the name of the French Society. Sumptuary laws are well observed. Amongst these, the use of a carriage in the town is prohibited to all sorts of persons except strangers; and it is

almost inconceivable, that in a place so commercial and wealthy, luxury should so little prevail.

Zuric was formerly an imperial city, and obtained from the emperor Frederick II. very considerable privileges; which were acknowledged and augmented by several of his successors. The civil war between the magistrates and the people in 1335 nearly reduced the city to ruins; but the former being banished, the citizens, in 1337, established a new form of government, which was confirmed by the emperor Louis of Bavaria. The exiles, after several fruitless attempts, were at length re-admitted; but engaging in a conspiracy against the citizens, were discovered and put to death. In consequence of this execution, the nobles in the neighbourhood took up arms; and Zurich, after having ineffectually applied for assistance to the emperor Charles IV., formed an alliance with Lucerne, Uri, Schwitz, and Underwalden, and was admitted a member of their confederacy. This event happened in the year 1351. The four cantons yielded the pre-eminence to Zurich: a privilege it enjoys at present; being the first canton in rank, and the most considerable in extent, both of territory and power, next to Berne. In the same year, Zurich was afflicted by the four cantons against Albert, duke of Austria, who besieged the town, and was repulsed with great loss.

Zuric was the first town in Switzerland that separated from the church of Rome, being converted by the arguments of Zuingle.

The charitable establishments at Zurich are, the orphan-house, which is regulated with extreme attention and care; an alms-house for poor burghers; an hospital for incurables, and that for the sick of all nations, which usually contains between six or seven hundred patients; and the Allmosen-Amt, or foundation for the poor: this excellent institution puts out children as apprentices; and distributes money, clothes, and books of devotion to poor persons, as well in the town, as in different parts of the canton, at the recommendation of the respective ministers. Here is also a chirographical seminary, formed by voluntary subscriptions, to the support of which, Dr. Rhan, an eminent physician, was a liberal contributor.

At Zurich public education is a concern of the state, and under the immediate protection of government. The office of a professor gives rank and estimation, and is often held by a member of the Senate and of the Great Council. The principal literary establishments for the instruction of youth are, the Caroline college for students in divinity; *Collegium Humanitatis*, or the college for polite literature; and the school of arts: the first has twelve professors, the second two, and the last seven. The learned languages, divinity, natural history, mathematics, and in short every species of polite learning, as well as abstract science, is taught at a small expence in these respective seminaries.

In consequence of the peculiar attention paid by government, since the reformation, to the education of youth, Zurich has produced many persons, who have distinguished themselves in all departments of literature: among these we may reckon Zuingle and Bullinger, Conrad Gesner, Hottinger, Simler, Spon, Scheutzer, Heidegger, Breitinger, Bodmer, Hirtzel, Solomon Gesner, and Lavater. For each of these distinguished persons, see our biographical articles.

Dr. Hirtzel was a learned physician, and deservedly styled the Swiss Plutarch: he distinguished himself, among various publications, by the *Socrate Rustique*, and by the lives of Sultzer and Heidegger. Leonhard Meiter, professor of history and morality in the school of arts, deserves mention, on account of his numerous and valuable publications, in all which he has displayed great zeal for the promotion of literature,

literature, correctness of taste, liberality of sentiment, and extensive historical and biographical knowledge. In his observations on fanaticism and intolerance, he has forcibly evinced their dreadful effects on government and civil society by historical facts, and approved himself an able writer in combating persecution, and in repressing the prevalent spirit of fanaticism.

The public library at Zurich contains about 25,000 volumes, and a few curious MSS., of which latter are, the original MS. of Quintilian, the Psalms in the Greek tongue, written on parchment dyed of a violet colour, the letters being silver and golden, and the marginal reference red, somewhat similar to the "Codex Argenteus" of Upfal, and supposed to have once formed a part of the "Codex Vaticanus," and several MSS. of Zuingli. Zurich is a district 41 miles S.E. of Bale, and 36 S.W. from Constance. N. lat. 47° 18'. E. long. 8° 25'. Coxes's Travels in Switzerland, vol. i.

ZURIC, a lake of Switzerland, situated in the canton to which it gives name, about 10 leagues in length, and one in breadth, of an oblong form; and though not so large as that of Constance, more thickly studded with villages and towns. The adjacent country is finely cultivated, and well peopled; and the southern part of the lake appears to be bounded with the high stupendous mountains of Schweitz and Glarus. The scenery is picturesque, lively, and diversified.

ZURIMACZOW, a town of Austrian Poland; 22 miles S. of Luckow.

ZURITA, a town of Spain, in New Castile, on the left bank of the Tagus; 48 miles N.E. of Toledo.

ZURITO, a town of Peru, in the diocese of Cusco; 12 miles N.W. of Cusco.

ZURLINDEN, a town of Prussia, in the palatinate of Culm; 18 miles E.N.E. of Thorn.

ZURMENTUM, in *Ancient Geography*, a town in the interior of Africa Propria, S. of Adrumetum. Ptol.

ZURNAPA, in *Zoology*. See CAMELOPARDAL.

ZURUPALCA, in *Geography*, a town of Peru; 44 miles S. of Potosi.

ZURZACH, a town of Switzerland, in the county of Baden, on the Rhine, chiefly celebrated for its fairs, at which great quantities of goods are sold by the merchants from Germany, France, and Italy; 25 miles E. of Bale.

ZURZONZA, a town of Mexico, in the province of Mechoacan, situated on an island in a lake; 20 miles W. of Mechoacan.

ZURZURA, in *Ancient Geography*, a town of Asia, in the Greater Armenia. Ptol.

ZUSAM, in *Geography*, a river of Bavaria, which runs into the Danube, opposite Donauwert.

ZUSCHEN, a town of Germany, in the county of Waldeck; 4 miles N.W. of Fritzlär.

ZUSCHEN, or *Zuchenau*, a town of Germany, in the duchy of Westphalia; 5 miles S.W. of Medebach.

ZUSEL, a river of France, which runs into the Roer, at Sulstern.

ZUSMERSHAUS, a town of Bavaria, in the territory of Augsbürg; 13 miles N.W. of Augsbürg.

ZUSNIN, a town of Iltria; 11 miles N.N.E. of Pedena.

ZUTPHEN, a city of Holland, and capital of a county to which it gives name, situated on the river Berckel, which passes through the middle of it, fills its ditches, and immediately joins the Iffel. It takes its name from the two Flemish words "Zudt Vunen," which signify Southern Meadows. The principal buildings are, the church of

St. Walburge, the town-house, the college of the deputies of the comté, and an ancient building, which they call "s'Graven-Hof," or Palace of the Comté. Otho I. of Nassau, acquired this country in the 11th century, by his marriage with the heiress of Gerlach, count of Zutphen, since which it has ever been annexed to Guelderland; 7 miles S. of Deventer. N. lat. 52° 10'. E. long. 6° 5'.

ZUTPHEN *Islands*, a group of small islands, in the straits of Sunda. S. lat. 5° 50'. E. long. 105° 42'.

ZUTZ, a town of Switzerland, in the league of the Grisons, on the Inn. This town, though not the largest, is reckoned the principal place of Upper Engadine, because it contains the criminal court of justice. This court consists of the landman of Sotto, one of the two communities of Upper Engadine, who is president, and sixteen jurymen, called Trouadors, taken equally from each district. Justice is said to be more equitably administered in this court than in any other throughout the Grisons, excepting at Coire. The vicinity of Zutz, and also of Scampf, is the finest part of the valley of Engadine; it there produces some rye and barley, and the mountains are clothed with verdure to their very summits.

ZUURE-VELDT, a division of Graaf Reynet, which is an extensive plain country, stretching from the Sunday river, in Zwartkop's bay to the great Fish river, and is the same kind of good arable or pasture land as the plains of the Antiniequas division in Zwelendani; but it is now exclusively in the possession of the Kaffers, from whom it was originally taken by the Boors. The great chafms towards the sea-coast, that are filled with thickets, abound in elephants and buffaloes; and in the great Fish river are, occasionally at least, found a few of the hippopotamus, or river-horse.

ZUWEITA, or ZUREITA, a town of the Arabian Irak; 35 miles S.E. of Helleh.

ZUYDER-ZEE, or ZUIDER-SEE, a great gulf or bay of the German ocean, which extends from south to north, in the United Provinces, between Friesland, Overissel, Guelderland, and Holland. It is so called from its situation towards the south, and is said formerly to have been a lake, and that the land is swallowed up that united North Holland with Friesland.

ZUZAN, a town of Persia, in that part of Khorassan which extends from N. lat. 32° 30' to 34° 40', and from 56° to 62° of E. long. It is the ancient "Susa," now an inconsiderable place, situated at the same distance from Pufhing as the latter is from Herat.

ZUZON, a town of Spain, in Old Castile; 22 miles N.E. of Siguenga.

ZUZYGIUM, in *Botany*. See SYZYGIUM and CALYPTRANTHES, to which latter genus belongs the original *Suzygium* of Browne.

ZWAMMERDAM, or ZWADENBURGERDAM, in *Geography*, a town of Holland, on the Rhine, which was pillaged and burned by the French, in the year 1762; 6 miles N. of Gouda.

ZWARTE-BERG, as well as *Cango* and *Trada*, are divisions of Zwelendani, which are the Karroo plains, situated between the first and second chains of mountains, but being well watered by the mountain streams contain fertile patches of ground. Their great distance, however, from the Cape, and very bad roads, prevent an extensive tillage. In these plains are numerous ostriches, and herds of quachas, zebras, and hartebeests. Behind the first chain of mountains, in these divisions, are two hot springs of chalybeate water.

ZWARTE-BERG is also a division of Graaf Reynet, which

is a portion of the mountain of the same name, in the district of Zwelldendam, to which it ought properly to belong. Sheep and horned cattle are the chief produce of the farmers.

ZWARTE-KOP's River is a fertile and extensive division of Graaf Reynet, lying to the southward of Zwarde-Ruggens, and capable of producing an abundant supply of grain, convenient to be delivered at a trifling expence at the bay. About 15 miles to the westward of the bay are large forests of timber-trees, near which is an appearance of a rich mine of lead. Near the bay is also a salt lake, which yields a plentiful supply of that article. Wax from the myrica cerifera and aloes might be furnished by this division as articles of commerce.

ZWARTE-RUGGENS, a division of Graaf Reynet, which is a stony tract of country to the southward of Camdeboo, another division lying at the foot of the snowy mountains. It is very fertile supplied with water, and produces little except succulent plants, among which are two or three species of euphorbia. Few families are found in this division, but here and there in the neighbourhood of the Sunday river, which runs through it. The cattle and sheep are small, but generally in good condition.

ZWARTKOP'S BAY. See ALGOA Bay.

ZWARTLAND, EAST, and Twenty-four Rivers, are two divisions of the district of Stellenboich and Drakenstein, consisting of widely-extended plains, stretching in breadth, from the Berg river to the great chain of mountains, and to the Picquet Berg, in length, to the northward. These are considered as the granaries of the colony. The crops, however, in Zwartland, are as uncertain as the rains, on which their success almost entirely depends. In the Twenty-four rivers, the grounds may be irrigated by the innumerable streamlets that issue from the great chain of mountains, in their course to the Berg river. These form swamps, that have been productive of very fine rice. Wheat, barley, and pulse, are the principal articles that are cultivated in those two divisions; but they have also plenty of fruit, and make a little wine for family use.

ZWELLEDAM, a tract of country in southern Africa, which lies upon the sea-coast between Breede river on the W., and Camtoos river on the E., and extends northerly to the second chain of mountains, called the Zwarde-Berg, or Black mountains. The length is about 380 and breadth 60 miles, comprehending an area of 19,200 square miles, which is occupied by 480 families, so that each family has, on an average, 40 square miles of land. The population of Zwelldendam, ascertained on oath in the year 1798, consisted of 3967 Christians, and 2606 slaves and Hottentots, making a total of 6663. The stock and produce comprehended 9049 horses, 52,376 horned cattle, 154,992 sheep, 220½ leggers of wine made, 16,720 muids of wheat reaped in 1797, and 10,554 muids of barley and rye.

ZWELLEDAM, Drosdy, or village of, a division of Zwelldendam, situated at the foot of the first chain of mountains that runs E. and W., or parallel to the sea-coast, and distant from Cape Town about 140 miles. It is composed of about 30 houses, scattered irregularly over a small but fertile valley, down the middle of which runs a plentiful stream of water. At the head of the valley stands the house of the landroft, to which is annexed a large garden well stocked with a variety of fruits, and a spacious vineyard; the whole enclosed and planted with oaks and other trees. In the middle of the village a large church has been lately erected, which is the only place of worship in the whole district. The other divisions of Zwelldendam are, the country between

the drosdy and Gauritz river, named according to the rivers that cross it, Cango, Zwarde-Berg, Trada, Mossel bay, Antinieguas land, Plettenberg's bay, Ollifant's river, Kam-naaif, Lange-Kloof, and Sitfikamma. Barrow's Southern Africa, vol. ii.

ZWENCKAU, a town of Saxony, in the principality of Merleburg, on the Elster. In the year 1429, this town was burned by the Hussites; 5 miles S. of Leipfic. N. lat. 51° 14'. E. long. 12° 18'.

ZWENTENDORFF, a town of Austria; 6 miles W. of Tulln.

ZWERCHBACHLEIN, a river of Wurtemberg, which runs into the Nagold, near the town of Nagold.

ZWERNITZ, a town of the principality of Culmbach; 10 miles S.W. of Culmbach.

ZWERNTLDORFF, a town of Austria; 6 miles E. of Weikendorf.

ZWETHAN, a town of Saxony; 20 miles S.E. of Wittenberg.

ZWETL, a town of Austria, at the conflux of the Zwetl and the Kamp; 26 miles W.N.W. of Crems. N. lat. 48° 33'. E. long. 15° 7'.

ZWETL, a river of Austria, which rises about four miles west from Weitra, and runs into the Kamp, at Zwetl.

ZWETZEN, a town of Thuringia; 3 miles N. of Jena.

ZWETZEY, a town of Croatia, on the river Mrešnitza; 12 miles S. of Sluin.

ZWEYBRUCKEN. See DEUX-PONTS.

ZWEYDRITTELSTUCK, or Piece of Two-thirds, in Commerce, a silver coin in Germany, worth two-thirds of a rix-dollar of account.

ZWIAHEL, in Geography, a town of Russian Poland; 90 miles E. of Luckow.

ZWICKAU, a town of Saxony, in Erzgebirg, on the Mulda. It has a citadel, three churches, and a Latin school, in which is a good library: here is a manufacture of cloth, and another of cards, for the use of wool-combers; with a considerable inland trade; 38 miles S.S.E. of Leipfic. N. lat. 50° 39'. E. long. 12° 25'.—Also, a town of Bohemia, in the circle of Boleflau; 4 miles W. of Gabel.

ZWIELLAUKA, a town of Moravia, in the circle of Olmutz; 26 miles W. of Olmutz.

ZWIFALTEN, a princely abbey founded in the year 1089. In 1802, it was given among the indemnities to the duke of Wurtemberg; 58 miles W. of Augsburg. N. lat. 48° 17'. E. long. 8° 30'.

ZWINGENBERG, a town of Hesse Darmstadt, situated on the Bergstraffe. In 1693, the greater part of this town was destroyed by the French, since which it has been rebuilt in a better manner; 10 miles S. of Darmstadt.

ZWINGENDORFF, a town of Austria; 2 miles S. of Laab.

ZWINGERA, in Botany, a genus taken from Aublet, dedicated under this name to the memory of several Swifs botanists of the family of Zwinger, who for three generations have cultivated this science at Basil, chiefly, indeed, with a reference to the medical qualities of plants. Theodore Zwinger, professor of anatomy and botany in that university, who died in 1724, aged 67, published in 1696 a folio German Herbal, of 995 pages, with wooden cuts, borrowed from Gesner and Camerarius, which is little known out of his own country. Some botanical dissertations also appeared under his presidency. His son Frederick gave an enlarged edition of the above Herbal in 1744; and has published in the *Ada Helvetica*, v. 1. 50, a plate and description of a very remarkable fungus, apparently belonging to

Peziza,

Peziza, but of which we find no notice taken by Perfoon. The *NOLANA* of Linnæus, (see that article,) was once published under the name of *Zwingera humifusa*, by John Hofer, in *Ab. Helvet.* v. 5. 267. t. 1, but this plant has had many names besides.—Schreb. Gen. 802. Willd. Sp. Pl. v. 2. 569. Mart. Mill. Dict. v. 4. (Simaba; Aubl. Guian. 400. Juss. 373.)—Clas and order, *Decandria Monogynia*. Nat. Ord. *Terebinthaceæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, small, in five deep, ovate, acute segments. *Cor.* Petals five, oblong, obtuse, spreading. *Stam.* Filaments ten, capillary, dilated and hairy at the base, shorter than the corolla; anthers ovate. *Pistl.* Germen superior, seated on a glandular receptacle, roundish, with five deep furrows; style longer than the stamens, thread-shaped, striated; stigmas five, simple. *Peric.* Capsules five, coriaceous, ovate, spreading, of one cell. *Seeds* solitary, ovate.

Eff. Ch. Calyx in five deep segments. Petals five. Filaments dilated and hairy at the lower part. Capsules five, coriaceous, seated on a fleshy receptacle. Seeds solitary.

Obf. The flowers are said to be occasionally only four-cleft and octandrous. This genus is not much akin, as Willdenow thought, to *QUASSIA*, but rather to *CNESTIS* (see those articles); differing from the latter in having one style instead of five. How far their fruits correspond, we know not enough of the seed-vessel of *Zwingera* to determine.

1. *Z. amara*. Bitter *Zwingera*. Willd. n. r. (Simaba guianensis; Aubl. Guian. 400. t. 153.)—Native of the woods of Orapu in Guiana, bearing flowers and fruit in June. A shrub, not more than seven or eight feet high, whose stem is three or four inches in diameter, with a white soft wood. Branches numerous, alternate. Leaves alternate, stalked, either ternate, or pinnate, of two or three pair, with an odd one, of elliptic-lanceolate, pointed, emarginate, entire, smooth leaflets, the largest of which are three and a half inches long, and an inch, or more, in breadth. Flowers five or six together, in little axillary clusters. Petals whitish, surrounding the green disk. Fruit yellow; the inner rind green and bitter. Nothing is recorded concerning the qualities or uses of this shrub.

ZWISSEL, in *Geography*, a town of Bavaria, on the Regen; 42 miles E. of Ratibon.

ZWITTAU, or ZWITAWA, a town of Moravia, in the circle of Olmutz; 30 miles N.W. of Olmutz. N. lat. 49° 43'. E. long. 16° 16'.

ZWITTAU, a river of Moravia, which rises in the south-east part of Bohemia, and joins the Swarta, near Brunn.

ZWOL, or SWOL, a town of Holland, in the department of Overissel, situated on the river Aa, between the Iffel and the Vecht, in the country of Zallant. It is a strong place, well fortified, and surrounded with a double ditch, filled with the waters of the Aa. Its situation is very advantageous, on an eminence which commands the country, and is the ordinary passage from Holland to the provinces of Friesland, Groningen, and Overissel. It was formerly a free and imperial city, and ranked among the Hanse towns. The magistracy is composed of eight echevins, and eight common-council. The celebrated Thomas à Kempis, otherwise called Hamerken, was a regular canon in a priory of Augustines in this place, and died here in 1471, aged 91; 28 miles S.W. of Covorden. N. lat. 52° 32'. E. long. 6° 1'.

ZWOLFAING, a town of Austria; 8 miles S.S.E. of Vienna.

ZWONIGRAD, a town of Dalmatia, and capital of a district; 60 miles S.E. of Segna.

ZWONITZ, a town of Saxony, in the circle of Erzgebirg; 4 miles N.W. of Grubenhagen.

ZWORNICK, a town of Bosnia; 68 miles S.W. of Belgrade. N. lat. 44° 37'. E. long. 18° 50'.

ZWOTA, or TZWONA, a river of Bohemia, which runs into the Egra, near Falkenau.

ZYDACZOW, a town of Austrian Poland, in Galicia; 30 miles W.N.W. of Halicz.

ZYGÆNA, in *Ancient Geography*, an island in the northern part of the Arabic gulf. Ptolemy.

ZYGÆNA, in *Ichthyology*, a species of *squalus*, which see; called by Willughby *balance-fish*. See also SHARK.

ZYGASTICUM, ΖΥΓΑΣΤΙΚΟΝ, formed of ζυγος, a balance, among the *Ancients*, money paid for weighing things.

ZYGER, in *Geography*, a river of Hungary, which runs into the Kyros, 5 miles W. of Boros Jenó.

ZYGES, in *Ancient Geography*, a people of exterior Libya, towards the coast of the Mediterranean sea, W. of the Mareotide Nome. Ptolemy.

ZYGL, a people of Asia, of the number of those who inhabited the Cimmeric Bosphorus, between the Athæi and Heniochi. Strabo.

ZYGIA, in *Botany*, ζυγία of Theophrastus, the second kind of his σφινδαμνος, or Maple, remarkable for its yellow and veiny wood, is spoken of as a mountain-tree, but botanists have not ascertained the precise species. Pliny's account of this matter is extracted and abridged from the above Greek author, but is not made at all more clear. He however seems to have been acquainted with a beautiful wood, of the Maple kind, which he says was compared to a peacock's tail, and grew chiefly in Isthria and Rhetia. Can this have been the *Acer Opalus* of modern authors? (See Willd. Sp. Pl. v. 4. 990.) Anguillara has long suspected that tree, which Linnæus and many other botanists have strangely overlooked, to have been the ζυγία of Theophrastus. Its native country, and veined yellow wood, sometimes very beautiful, are in favour of this opinion. De Theis, following Bodæus a Stapel, and other commentators on Theophrastus, who are led by the obvious derivation of the name from ζυγος, a yoke, take the tree in question for our *Carpinus*, whose hard and tough wood serves to make yokes for oxen. He ingeniously supports this opinion by the Celtic origin of *Carpinus*, from *car*, wood, and *pin*, head; and further by its English synonymy, *Hornbeam*, oxen being yoked by their horns. The wood of the *Carpinus*, however, is neither yellow nor beautifully veined, and it is most probable ζυγία had some other origin, or allusion. Robert Constantine, cited by Bodæus a Stapel, seems to confound the *Acer Opalus* with *Viburnum Opulus*, which he terms "the *Opulus* of Columella, a French shrub, used for bowers." This last has nothing in common with the history of the ζυγία.

Whatever may have been the ancient *Zygia*, Dr. Patrick Browne, finding this name unoccupied, has applied it to a Jamaica shrub, which appears to belong to *Mimosa*; see Browne Jam. 279. t. 22. f. 3. Nor is this application too unsuitable as may seem at first sight; for the author had evidently in his mind the yoked leaflets, to which he alludes in his specific definition. We do not find that Linnæus, except in manuscript, or any other author, has adopted this as a *Mimosa*. Jusseu, in his Gen. Pl. 366, ranges Browne's *Zygia*, with a few other genera, at the end of his *Leguminosæ*, adding a reference to *Mimosa Bourgoni*, Aubl. Guian. t. 358, as a similar plant or genus. We do not see why it

was not placed near *Mimosa*, in the first section of that natural order. Swartz, Ind. Occ. 980, speaks of Browne's figure of the flower of *Zygia*, as exactly like his own *Mimosa comosa*, Prodr. 85; but he adds that the plants are different, without any further elucidation of the former. There is no specimen of *Zygia*, amongst the plants in the Linnæan herbarium, collected by Browne, and sent by Solander to Linnæus. In a manuscript catalogue of Jamaica plants, in Dr. Browne's own hand, given to the writer of this article by A. B. Lambert, esq., *Mimosa Zygia* stands between *sagifolia* and *Unguis Cati*, with this remark, which is not in the author's History of Jamaica, "*folia bijugata, five sustentaculis bipartitis, singulis diphyllis.*" This plant is there called Yoke-wood. In the printed work it is denominated Horlewood, or Hoop-wood, the wood being "pretty tough, and sometimes cut for hoops. The shrub is very common in St. Mary's, growing chiefly in low moist lands; but is sometimes found in the mountains, where it commonly rises to the height of ten or twelve feet, or better." There are all the particulars we can gather relative to Browne's *Zygia*.

ZYGIA, in the *Instrumental Music of the Ancients*, a flute peculiar to weddings, according to Apulcius. (Metam. lib. iv.) The word *zygia* is a Greek adjective, which implies *nuptial*. The *zygia* was probably a double flute; for Julius Pollux (Onomast. lib. iv. c. 10.) says, "there was also a flute air for the wedding; executed on two flutes, one longer than the other."

ZYGIA, in *Entomology*, a genus of insects belonging to the order of coleoptera, the characters of which are, that the antennæ are moniliform, the palpi unequal and filiform, the lip elongated and membranaceous, and the jaw unidentate. There is one species, *viz.*

OBOLGA. Found in the East, oblong, red, with head and wing-sheaths cyanous.

ZYGIANA, in *Ancient Geography*, a country of Asia Minor, in Bithynia. Ptolemy.

ZYGIS, in *Botany*, the specific name of a species of *THYMUS*, (see that article, n. 9.) supposed to be the *ζυγίς* of Dioscorides. De Theis, who writes this word *ζυγίς*, without any authority that we can find, derives it from *ζυγός*, the *hum of bees*, which is confirmed, apparently without his knowledge, by the modern Greek name of the same plant, *αζαζή*, the *delight of bees*. Such an appellation is peculiarly suitable to a plant well known to be highly grateful to those insects, and which is supposed to give its aromatic flavour to the famous honey of mount Hymettus, a spot where this *Thymus* abounds. Undoubtedly there are other species of the same genus, as well as of *Thymbra*, *Satureia*, &c., found in the same neighbourhood, which contribute to produce this flavour, in as powerful a degree perhaps as the above.

ZYGITÆ, in the *Roman Gallies*, a term used to express those rowers in the triremes, or three-rowed gallies, who sat on the second row, that is, above the thalamitæ, and below the thranitæ.

ZYGOMA, *Ζυγομαχία*, in *Anatomy*, a bone of the head, otherwise called os jugale; or, it is the bony arch under which the temporal muscle passes.

The word is formed from *ζυγόν*, *I join*; so that *zygoma*, properly speaking, is the juncture of two bones. See *CRANIUM*.

ZYGOMATIC PROCESS of the temporal bone and os melæ: the parts contributing to form the *zygoma*.

ZYGOMATICUM, OS, the cheek-bone, so called

because it contributes largely to the formation of the *zygoma*. See *CRANIUM*.

ZYGOMATICUS, Major and Minor, muscles of the face, connected to the corner of the mouth. See *DEGLUTITION*.

ZYGOMATICUS is also an epithet given to the future that binds the two processes of the *zygoma* together.

ZYGOPHYLLUM, in *Botany*, so named by Linnæus, from *ζυγός*, a *yoke*, and *φυλλός*, a *leaf*, each leaf, of most of the species, being composed of a pair of leaflets, yoked, as it were, together, and somewhat resembling the foliage of the garden bean, *Vicia Faba*; whence this genus obtained, from Dodonæus and Tournefort, the name of *Fabago*. Hence also arose its English appellation of *Bean-Caper*, given by Gerard. *Fabago* was properly deemed inadmissible, being compounded of another name, though of one no longer in use as generic. We may observe moreover, that it conveys an erroneous idea; for the plant in question does not "bear beans," but leaves, resembling bean leaves.—Linn. Gen. 212. Schreb. 288. Willd. Sp. Pl. v. 2. 560. Mart. Mill. Dict. v. 4. Ait. Hort. Kew. v. 3. 39. Sm. Prodr. Fl. Græc. Sibth. v. 1. 273. Juff. 296. Lamarck Dict. v. 2. 441. Illustr. t. 345. Gært. t. 112. (*Fabago*; Tourn. t. 135.)—Class and order, *Dicandria Monogynia*. Nat. Ord. *Grinales*, Linn. *Rutaceæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of five ovate, obtuse, concave, erect leaves. *Cor.* Petals five, dilated upwards, obtuse, emarginate, rather longer than the calyx. Nectary of ten converging, pointed leaves, or scales, sometimes divided, embracing the germen, each of them attached to one of the filaments near its base. *Stam.* Filaments ten, awl-shaped, attached to the outside of the nectary, shorter than the corolla; anthers oblong, incumbent. *Pist.* Germen superior, oblong, tapering at the base; style awl-shaped, the length of the stamens; stigma simple. *Peric.* Capsule oblong, or roundish, with five angles and five intermediate furrows, five cells and five valves, the partitions linear, from the middle of each valve. *Seeds* several, roundish kidney-shaped, inserted alternately, in two rows, into the middle of the valves.

Obf. Linnæus remarks, that the seed-vessel differs in shape in the different species, and that in some the flowers are four-cleft and octandrous. Schreber records an observation of Reichard, merely taken from the *Mantissa* of Linnæus, that *Z. album* has five *stigmas*; but we do not find this to be correct. Our fifteenth species is said to have five distinct *styles*.

Ess. Ch. Calyx of five leaves. Petals five. Nectary of ten scales, embracing the germen, and bearing the stamens. Capsule of five cells, superior.

The plants of this genus are, for the most part, shrubby, with simple or twin *leaves*, (rarely ternate or pinnate,) which are opposite, mostly stalked, entire, often decid., of a thick or succulent texture, accommodated to the dry and sunny situations where the greater part of the species grow. A very few are found in South America, or Guinea; the rest are natives of Syria, Arabia, Siberia, and especially of southern Africa, about the Cape of Good Hope. The flowers are solitary, axillary, yellow, white, or reddish, often brilliant and rather handsome. The *seed-vessel*, though answering in general to the above description, which is made from *Z. Fabago*, is variously shaped in the different species, and in some appears to be lined with a sort of horny elastic coat, analogous to the tunic of the seeds, so remarkable in the genuine *Rutaceæ*. Such is the case in *Z. microphyllum*, the

ZYGOPHYLLUM.

the edges of whose inflexed valves seem to constitute the partitions; yet the cells do burst at the outer margin, as well as at the inner. Willdenow defines fourteen species, which we shall find a necessity of extending to sixteen.

1. *Z. simplex*. Cylindrical-leaved Bean-Caper. Linn. Mant. 68. Willd. n. 1. (*Z. portulacoides*; Forfk. *Ægypt.-Arab.* 88. Ic. t. 12. f. B.)—Leaves simple, sessile, cylindrical.—The most common of all plants in the driest parts of the deserts of Arabia, where it is known by the name of *Garmal*, and esteemed by the Arabs very good for removing specks in the eyes, for which purpose the bruised leaves are applied, mixed with water. For this we have the authority of Forskall, who sent seeds to Linnæus. These vegetated at Upsal, but the plants did not live to produce flowers. The root is simple, tapering, apparently annual. Stem prostrate, repeatedly forked, round, smooth. Leaves sessile at each joint, spreading, an inch long, obtuse, somewhat dotted. Flowers yellow, quarter of an inch in diameter, almost sessile. Petals round, with long claws.

2. *Z. cordifolium*. Heart-leaved Bean-Caper. Linn. Suppl. 232. Willd. n. 2. Thunb. Prodr. 80. Ait. n. 1.—Leaves simple, sessile, opposite, roundish, somewhat heart-shaped.—Gathered by Thunberg, at the Cape of Good Hope, from whence it was sent by Mr. Masson to Kew garden, in 1774. This is a green-house shrub, flowering in October. We have seen no specimen.

3. *Z. Fabago*. Common Bean-Caper. Linn. Sp. Pl. 551. Willd. n. 3. Ait. n. 2. (Capparis Fabago; Dod. Pempt. 747. Ger. Em. 897. Bess. Eyf. æstiv. ord. 10. t. 1. f. 1. C. leguminosa; Lob. Ic. v. 2. 58. Fabago Belgarum; Dalech. Hist. 456. *Telephium* Diofcoridis; Column. Ecphr. 132. t. 131. Morgani; Rauw. It. t. 113.)—Leaves conjugate, stalked; leaflets obovate. Calyx smooth. Petals entire. Capsule oblong. Stem herbaceous.—Native of Syria, Persia, Barbary, &c. A hardy, but not common, herbaceous perennial in our gardens, flowering in autumn, cultivated by Gerarde, in 1596, and seen a few years afterwards, in the garden of cardinal Aldobrandini, at Rome, by Fabius Columna, who took this plant for the *Telephium* of Diofcorides, and has left us a most faithful representation of it, too much neglected by Linnæus and recent authors, who only refer to Dodonæus. Whether Columna erred or not with respect to the name, the reader will judge by consulting the article TELEPHIUM. The root is tapering, fleshy, producing from its crown several spreading, alternately branched, leafy, round, herbaceous, smooth stems, one and a half or two feet high. Leaflets an inch long, entire, smooth, green, unequal at the base, furnished with a principal rib, and one or two smaller ones. Footstalks rather shorter than the leaflets, swelling upwards, smooth, channelled, crowned with a small, intermediate, awl-shaped point, like an abortive leaflet. Stipulas between the footstalks, in pairs, membranous, ovate, pointed, oblique. Flowers yellow, on simple, axillary, opposite, nearly upright stalks, hardly so long as the footstalks. Calyx-leaves concave, quarter of an inch long, green, even, with a membranous edge. Petals rather longer, obtuse. Nectaries jagged, almost pectinate. Five of the stamens deflexed, five ascending. Capsule above an inch in length. Seeds numerous.

4. *Z. fatidum*. Fetid Bean-Caper. Schrad. Sert. Hannover. 17. t. 9. Willd. n. 4. Ait. n. 3. (*Z. infuave*; Curt. Mag. t. 372.)—Leaves conjugate, stalked; leaflets obovate. Calyx downy. Petals jagged. Capsule roundish. Stem shrubby.—Native of the Cape of Good Hope, from whence it was introduced in 1790, by Mr. Masson. This is a hardy green-house shrub, flowering all summer long, but rendered

undesirable by the strong fox-like scent of its leaves, resembling that of the Crown Imperial, and peculiarly offensive when the house is either shut up, or warmed by the sun. The shrubby stem distinguishes this species from the last; but the short, roundish, or obovate, fruit, and jagged petals, which are five times the length of the calyx, and marked with a red spot at the base of their limb, afford essential marks of difference. *Z. retrofractum* of Thunberg, cited with a mark of doubt by Willdenow, has no resemblance to either.

5. *Z. maculatum*. Spotted-flowered Bean-Caper. Ait. ed. 1. v. 2. 60. ed. 2. n. 4. Willd. n. 5.—“Leaves conjugate, stalked; leaflets linear-lanceolate.”—Native of the Cape of Good Hope, from whence it was introduced, in 1782, by George Wynch, esq. A green-house shrub, flowering in October and November. The petals are yellow, with a red heart-shaped spot, at the base of each, above which, in the three upper ones only, is a transverse red line. Aiton.

6. *Z. coccineum*. Scarlet-flowered Bean-Caper. Linn. Sp. Pl. 551. Willd. n. 6. (*Z. desertorum*; Forfk. *Ægypt.-Arab.* 87. Ic. t. 11. *Fabago arabica* teretifolia, flore coccineo; Shaw Afric. n. 231. f. 231.)—Leaves conjugate, on a fleshy stalk; leaflets cylindrical, smooth. Capsule oblong.—Plentiful in the arid valleys of the desert, between Cairo and Suez. The Arabs call this plant *Rottrafi*. All kinds of cattle, even the camel, refuse to eat it. Forfkall. The stem is shrubby, ascending, much branched, often a foot and a half high. Leaflets half or three-quarters of an inch long, obtuse, thick and succulent, quite smooth, supported in pairs on a club-shaped footstalk, somewhat more in length. Petals red, pointed. Capsule near an inch long. The shape of the capsule and leaflets, not to mention the colour of the flowers, distinguishes this species from the following.

7. *Z. album*. White Bean-Caper. Linn. Sp. Pl. 551. Mant. 379. Willd. n. 7. Ait. n. 5. Linn. fil. Dec. 1. 11. t. 6. Sm. Fl. Græc. Sibth. t. 371, unpublished. (*Z. proliferum*; Forfk. *Ægypt.-Arab.* 87. Ic. t. 12. f. A.)—Leaves conjugate, on a fleshy stalk; leaflets obovate, downy and hoary. Capsule roundish, five-lobed.—Native of Egypt, Cyprus, Barbary, &c. Forskall found it very abundantly about Alexandria; and Desfontaines near Tripoli, as mentioned by Shaw. Mr. Masson met with it in the Canary islands, and sent plants or seeds to Kew, in 1779, when this species is said to be kept in the dry stove, but not yet to have flowered. The stem is woody, diffuse, much branched, and very leafy. Leaves opposite, or aggregate, being accompanied by axillary tufts of smaller ones. The leaflets, as well as their footstalk, are thick, round, and juicy, both hoary, like the young branches, with fine, short, dense pubescence: the former are obovate, or almost globular, seldom a quarter of an inch long: the footstalk twice as much, and club-shaped. Flowers a third of an inch broad. Calyx reddish. Petals white, obtuse, crenate. Germen roundish, depressed, downy, with five rounded lobes. Capsule of the same shape; its coat, according to Forskall, pulpy, and there are only two seeds in each cell. The stigma is represented, in Mr. Ferdinand Bauer's drawing, rather slightly notched, not simple, as described by the younger Linnæus; but still less can we discern the five acute stigmas, mentioned in the *Maniffa*.

8. *Z. Morgana*. Four-leaved Bean-Caper. Linn. Sp. Pl. 551. Willd. n. 8. Ait. n. 6. (*Fabago capensis* frutescens major; Dill. Elth. 142. t. 116. f. 141. *F. triphylla* et tetraphylla, flore quadripetalo, fructu membranaceo quadrangulari; Burm. Afric. 7. t. 3. f. 2. *Planta africana*

F f

frutescens,

ZYGOPHYLLUM.

frutescens, portulacæ folio, *Morgani* sylvorum, ex brevi pediculo binis; Pluk. Amalth. 173, t. 429. f. 4.)—Leaves conjugate, nearly sessile; leaflets obovate, flat, smooth. Stem shrubby. Capsule roundish, tumid, five-lobed.—Native of the Cape of Good Hope. A green-house shrub in England, flowering most part of the summer. *Aiton*. The branches are somewhat quadrangular, very smooth. *Leaflets* an inch long, succulent, but not tumid; their common *footstalk* very short, or altogether wanting. *Stipulas* in pairs, lanceolate, pointed, reflexed. *Flower-stalks* the length of the leaves, unilateral, in pairs, declining. *Flowers* large, yellow, turning white in decay; their *petals* obovate, entire, streaked with purple at the base. *Neñaries* jagged or fringed, as in n. 3, 4, and perhaps some other species. *Capsule*, as represented by Burmann, an inch in diameter, globose, with five large, rounded, prominent lobes. We find the *petals* uniformly five, and entire; Linnæus says four, rarely five, and somewhat emarginate. There is reason to believe he confounded more than one species under the present. He has applied a specific name, which properly belongs to *Z. Fabago*.

9. *Z. seffilifolium*. Sessile-leaved Bean-Caper. Linn. Sp. Pl. 552. Willd. n. 10. Ait. n. 7. (*Fabago capensis* frutescens minor; Dill. Elth. 142. t. 116. f. 142. F. humilis quadrifolia glabra, flore albedo fructu rotundo; Burm. Afric. 4. t. 2. f. 1. F. africana arborescens, flore sulphureo, fructu rotundo; Commel. Rar. 10. t. 10.)—Leaves conjugate, sessile; leaflets obovate, flat, smooth. Stem shrubby. Capsule globose, undivided.—Native of the Cape of Good Hope. A green-house shrub, flowering in July and August, which appears to have been known in our gardens for above a century. Its size is inferior to the last, from which, according to Dillenius and Burmann, this species is essentially distinguished by the fruit. The capsule is either exactly globular, or, as Dillenius says, depressed like a Dutch cheese, its diameter not half an inch, nor is it furrowed, nor parted into large tumid lobes, like *Z. Morgana*. The leaves too are smaller, and more perfectly sessile. Linnæus defines them “rough-edged,” which we can find nothing to countenance, even in his own specimen. The flowers are drooping, orange-coloured, turning white as they fade; the petals crenate at the end, not much spreading. The *neñaries* are smaller, and much less conspicuously jagged than in the preceding.

10. *Z. fulvum*. Tawny Bean-Caper. Linn. Sp. Pl. ed. 1. 386. (*Z. seffilifolium* ß; Linn. Sp. Pl. ed. 2. 552. Willd. n. 10, ß. *Fabago* flore luteo, petalorum unguibus rubris, fructu sulcato oblongo acuto; Burm. Afric. 6. t. 3. f. 1.)—Leaves conjugate, sessile; leaflets obovate, flat, smooth. Stem shrubby. Capsule ovate, five-angled, acute.—Native of the Cape of Good Hope. Linnæus latterly considered this as a variety of the last, but we cannot discover on what his opinion was founded, there being nothing in his herbarium to represent *Z. fulvum*. There is indeed a specimen, referred by him at one time to *Z. Morgana*, and at another to *coccineum*, on which, having no affinity to the latter, we are led to suspect he wrote *coccineum* by accident for *fulvum*. In this the leaves have something of a common *footstalk*, though very short. The *neñaries* are long and jagged, as in *Morgana*. There is unluckily no fruit. Burmann’s figure of the capsule is so precise, that, considering the analogy of other species, so well distinguished by this part, we can have no hesitation in re-establishing *Z. fulvum*, as essentially differing from *seffilifolium*, whether our specimen be what Linnæus intended or not. The capsule of the real plant is above an inch long, with five acute angles, and as many deep intermediate channels, and terminates in a

point, being equally unlike *seffilifolium* on one hand, and *Morgana* on the other.

11. *Z. spinosum*. Spinous Bean-Caper. Linn. Sp. Pl. 552. Mant. 380. Willd. n. 11. (*Fabago tenuifolia spinosa, fructu rotundo; Burm. Afric. 5. t. 2. f. 2.*)—Leaves conjugate, sessile; leaflets linear, fleshy, smooth; flat above. Stem shrubby. Permanent stipulas hooked, spinous.—Native of the Cape of Good Hope. The stem is bushy, shrubby, about a foot high, branched from top to bottom; the branches acutely quadrangular. Leaves numerous, fleshy like those of a *Sedum*; the leaflets acute, scarcely an inch long, blunt, with a small point; their under side convex, or hemispherical. Stipulas in pairs, small, lanceolate, spreading, at length becoming hardened, hooked, and pungent, so as to form two, three, or four prickles at every joint. Flowers drooping, large and handsome, on longish, solitary, lateral stalks. Calyx reddish. Petals yellow, fading to white, nearly or quite entire. Neñaries entire, not fringed. Capsule, according to Burmann, “round, smooth, compressed, terminating in the very acute style.”

12. *Z. microphyllum*. Small-leaved Bean-Caper. Linn. Suppl. 232. Willd. n. 9. Thunb. Prodr. 80.—Leaves conjugate, somewhat stalked; leaflets inversely heart-shaped, smooth. Stem shrubby, with ascending branches. Capsule roundish, abrupt, of five compressed lobes. Style permanent.—Gathered by Thunberg, at the Cape of Good Hope. This is one of those hard, rigid, small-leaved, much branched shrubs, so characteristic of the botany of its native country. The branches are round, knotty, spreading, slightly hoary, or glaucous. Leaflets from one to three lines long, thick, oblique, sometimes obovate, but more frequently cloven, so as to become inversely heart-shaped; they are supported on a manifest, though short, thick footstalk. Stipulas minute. Flower-stalks thread-shaped, solitary, longer than the leaves, from the same buds. Flowers drooping, rather small, yellow. Calyx reflexed. Capsule the diameter of a pea, consisting of five rounded, vertical, compressed lobes, crowned with the spinous style, their surface rather reticulated: each of them bursts at the inner, as well as outer, edge into two elastic, or cartilaginous, valves, coated with a thin skin.

13. *Z. retrofractum*. Recurved Bean-Caper. Thunb. Prodr. 80.—Leaves conjugate, stalked; leaflets obovate, smooth. Stem shrubby, with spreading recurved branches. Flower-stalks shorter than the leaves.—Gathered at the Cape of Good Hope, by professor Thunberg, from whom we have a specimen. His short specific character was Willdenow’s only guide, when the latter reduced this plant to *Z. fastidum*, to which it has no affinity, and very little resemblance. The present, though a very distinct species, is most allied to *Z. microphyllum*, but the long, spreading, deflexed branches afford a characteristic difference of habit. The leaflets too are smaller, and seem to be always obovate, not orbiculate. Flowers very small, their little thick stalks hardly so long as the calyx. Neñaries lanceolate, entire. Germs, after the other parts of the flower are fallen, elliptic-oblong, deeply five-lobed, acute, crowned with the style; but we have none in an advanced state, to enable us to judge whether the lobes ever extend into a rounded semi-orbicular shape, like the last, as may very probably be the case.

14. *Z. afluans*. Surinam Bean-Caper. Linn. Sp. Pl. 552. Willd. n. 12.—Leaves conjugate, sessile; leaflets obovate, abrupt. Stems herbaceous, diffuse. Stipulas five at each joint.—Gathered in Surinam by Rolander, who sent seeds to Linnæus; but the plants raised from them

died without flowering. The *stems* are a foot long, smooth, roundish, except a flatness on the upper side. *Leaves* opposite, without veins. *Stipules* reflexed; two between each pair of leaves, at the uppermost side of the stem; one between the same pair, on the lower side; one between the leaflets of each leaf. *Linnaeus*. This last seems to answer to the little point, or rudiment of a leaflet, which occurs in several others of the broad-leaved species.

15. *Z. lanatum*. Woolly-jointed Bean-Caper. Willd. n. 13.—“Leaves ternate; leaflets papillary beneath. Styles five. Stem zigzag, woolly at the joints.”—Native of Sierra Leone. A plant of a doubtful genus, seen by the above author in a dried state only. The *stem* appears herbaceous, round and smooth, except the joints, which are remarkably woolly. *Leaves* opposite, small, on *footstalks*. *Leaflets* three, on very short partial *footstalks*, roundish, tapering at the base, pointed at the end; smooth on the upper side; beset underneath with prominent points. *Flower-stalks* axillary, solitary, single-flowered, erect; drooping after flowering. *Calyx* of five linear, obtuse leaves; downy on the inside, and at the edges. *Corolla* not present; perhaps fallen. *Filaments* but little dilated at the base. *Germs* club-shaped. *Styles* five, long, and thread-shaped. *Stigmas* obtuse. *Capisule* ovate, with five angles, five cells, and five valves with keel-like edges, bursting at the base. *Seeds* solitary. *Willdenow*. The ternate leaves afford a strong presumption against this being a *Zygophyllum*, and the want, as it seems, of *nectaries*, with the five *styles*, decide the question, in our judgment. Not having seen the plant, we leave it here for further inquiry.

16. *Z. arboreum*. Tree Bean-Caper. Jacq. Amer. 130. t. 83. Linn. Sp. Pl. 1673. Willd. n. 14.—Leaves abruptly pinnate. Stem arboreous.—Native of South America. Found by Jacquin, in uncultivated valleys about Carthagena, as well as in woods on the sandy sea-shore, flowering in July. A very handsome tree, forty feet high; the trunk being about six feet; the head dense, widely spreading, and extremely ornamental; the branches opposite, or forked. *Leaves* very numerous, opposite, four inches long, of about seven pair, without a terminal one, of alternate, sessile, elliptic-oblong, obtuse, entire, smooth, shining leaflets, an inch or more in length. *Clusters* axillary and terminal, shorter than the leaves, compound, lax, generally forked. *Flowers* large and handsome, without scent. *Calyx* yellowish-green, smooth. *Petals* orange-coloured, roundish, emarginate; their claws as long as the calyx. *Nectary* fringed; its scales gradually larger towards the upper side of the flower. *Stamens* erect, converging. *Germs* tapering at the base, into a long, thick, five-furrowed stalk. *Capisule* with five large membranous lobes. When it blossoms this tree affords a most magnificent spectacle, from the innumerable flowers, covering the bright green leafy head. Before the inflorescence appears, the leaves might incautiously be supposed doubly pinnate. The inhabitants give the name of *Guay-acan* to this tree, which is a general appellation for all kinds of hard wood that is useful for cabinet or other work. The trunk is reported to become changed into stone by lying in the earth, being incapable of corruption. *Jacquin*.

ZYGOPHYLLUM, in *Gardening*, comprises plants of the herbaceous and woody succulent exotic kind, among which the species are, the common bean-caper (*Z. Fabago*), the African bean-caper (*Z. seffilifolium*), the purslain-leaved Ethiopian bean-caper (*Z. Morgiana*), the thorny bean-caper (*Z. spinosum*), and the white Egyptian bean-caper (*Z. album*).

The first has a deep fleshy root, and soft herbaceous stalks, which decay in the winter.

The second is of a shrubby growth, and there are varieties, with yellow flowers, with sulphur-coloured flowers, with white flowers, with copper-coloured flowers, having mostly a reddish or brown spot near the base of each petal.

The third has also a shrubby stem, and there is a variety with flame-yellow-coloured flowers.

And the fourth has an under shrubby growth.

Method of Culture.—The first sort is raised from seeds, which should be sown in the spring in pots filled with light sandy mould, or on a hot-bed. When the plants have a few inches growth, they should be removed into separate pots, plunging them into a hot-bed, admitting air so as gradually to harden them to the open ground. They should be protected for a winter or two, and then be turned out into borders, or other parts, where the situation is warm, and the soil dry and rubbishy, as they are of a succulent nature.

The other sorts are capable of being increased by cuttings and feeds; the cuttings should be planted out in the spring or summer in pots filled with light sandy mould, and plunged in a hot-bed, being occasionally watered, when they quickly emit roots, and shoot at top; and when sown in the summer months, they may be planted in a shady place, or in pots placed in the shade, giving frequent waterings, when they will also take good root. In either method, they should be potted off separately, towards autumn, in order to be moved into the green-house or glass-case in the beginning of autumn.

The seed should be sown in the spring in pots of light earth, and be plunged in a hot-bed, where they soon come up: when a little advanced in growth, they should be pricked out in separate small pots, being watered and re-plunged into the hot-bed till well-rooted, when they should be gradually hardened to the full air, and in June set out to remain till the autumn, when they should be placed in the green-house, or some other place, where they may have protection for the winter.

The first sort affords variety in the borders, as well as among other potted plants; and the others in collections of the green-house kind.

ZYGOPOLIS, in *Ancient Geography*, a town of Asia, in the Colchide, near the town of Trapezunte.

ZYGOSTATES, among the *Ancients*, an officer who was the overseer of weights, and was to take care that tradesmen used none but what were just.

ZYGRIS, in *Ancient Geography*, a town on the coast of the nome of Lybia; and *Zygrita* are the people who inhabit this nome.

ZYMAR, a name given by some of the chemical writers to verdigrise.

ZYME, a word used by many authors to express ferment or leaven.

ZYMOLOGY, in *Chemistry*, a term used by some writers to express a treatise on fermentation, or the doctrine of fermentation in general.

Mr. Symphon has written a treatise on this subject, in which he refers the whole to the internal conflicts of acid and sulphur in bodies, and seems to think that the phenomena of hot-baths, the generation of minerals, and the production of mineral waters, the grand appearances of light, heat, and fire, and the generality of the subterranean phenomena of damps, earthquakes, and fiery eruptions, and the appearance of meteors, may be all explained by the doctrine

trine of fermentation, established on this basis. Sympson's Zymol. Chym.

ZYMOSIMETER, formed from ζυμωσις, *fermentation*, and μέτρον, *measure*, an instrument proposed by Swammerdam, in his book "De Respiratione," wherewith to measure the degree of fermentation occasioned by the mixture of different matters; and the degree of heat which those matters acquire in fermenting; as also the heat, or temperament, of the blood of animals.

ZYMOSIS, a word used by some to express fermentation, and by others for a flatulent tumour of the liver, or other of the viscera.

ZYMUM, in *Botany*, apparently from ζυμῶν, *a ferment*, a name which, De Theis says, is given to a plant of the Mauritius, by Noróna, a Spanish botanist, but without any explanation of its meaning, or application. This name is, nevertheless, retained by Aubert du Petit-Thouars, in his *Plantes des Isles d'Afrique*, fasc. 4.

ZYORY, in *Geography*. See SOUBRAU.

ZYPE, a kind of island of North Holland, formed by canals cut from the Zuyder Zee to the German ocean. It

was formerly a morafs, but is now converted into rich meadow land. On this spot the duke of York was posted, when he made terms with the French general Brune to evacuate Holland; having it in his power, by taking up the sluices, to inundate the country.

ZYRAS, in *Ancient Geography*, a river of Thrace, which watered the town of Dionysopolis. Pliny.

ZYRMA, a town of Thrace, near which ran the river Hebrus. Ptolemy.

ZYTHOGALA, formed of ζυθος, *cerevisia*, and γαλα, *lac*, *beer* *posset*, a drink recommended by Sydenham, as good to be taken after a vomit, for allaying the acrimonious and disagreeable taste it has occasioned, as well as to prevent gripes. Syden. *Observ. de Morb. acut.* p. 39.

ZYTHUM, or ZYTHOS, a sort of malt liquor, in use among the ancient Germans.

Matthioli represents the ancient *zythum*, and *curmi*, as the same with our beer and ale.

ZYTOMIERS, in *Geography*, a town and fortrefs of Ruffian Poland; 65 miles W. of Kiev. N. lat. 50° 16'. E. long. 28° 54'.

ADDENDA & CORRIGENDA.

A B C

VOL. I.

A AM. To that article subjoin, see STEKAN and VAT.
AARON, or HARUN. See BAGDAD. Add, and ALMANSOR.

AARON *Aarifibon*. Insert in the third line, after probably, as some say, but according to others, not, &c.

ABACUS, in *Architecture*, l. 23, *dele* CORINTHIAN and COMPOSITE.

ABADIOTS. See CANDIA.

ABANDONMENT, in *Commerce*, the act of relinquishing or surrendering goods to creditors and underwriters, either in lieu of a debt, or to avoid the payment of charges.

ABANDONMENT, in *Marine Infurance*. See RISK and RECAPTURE.

ABASCIA and ABASSA. In the reference *r.* ABKHAS for ABHKAS.

ABASSI. For GOMEROON *r.* GAMERON.

ABBEVILLE, l. 4 and 5, *r.* containing, in 1811, 21,156 inhabitants, of whom 6672 are slaves.

ABBEYBOYLE. After abbey, insert see BOYLE, and *dele* lat. and long.

ABBOT, GEORGE, 2d col. l. 4 from the bottom, instead of 1723-4 *r.* 1623-4.

ABBUTALS. See ABUTTALS.

A, B, C, DARIA, in *Botany*, a name given by Rumphius, Herb. Amboin. v. 6. 145. t. 65, to the *Verbefina Acnella* of Linnæus, see SPILANTHUS, n. 3. The above appellation is designed to express the use made of this plant by the black school-masters at Amboyna, who cause their young pupils to chew the flowers or the root, either alone

A B E

or with Betle-nut, in order that they may more easily pronounce some of the difficult Arabic letters, such as *Tfcha* and *Ze*, both which they commonly confound with *S*. The Malay name, *Daun murit*, School-boy's herb, given to this *Spilanthus*, as well as to *Bidens pilosa* of Linnæus, has the same allusion. Such plants agree with Pellitory of Spain, *Anthemis Pyrethrum*, in a peculiar property of stimulating the mouth, accompanied by a sense of coolness, and a slight saline taste, all which together cause a great flow of saliva. Hence they are beneficial in tooth-ache arising from cold rheum, but the slight numbness and tingling of the nerves, which attend their use, should seem rather unfavourable to precise enunciation. The recent flowers of *Spilanthus oleracea*, slightly rubbed upon the gums, are perhaps the best of the whole tribe for producing the above effects.

ABDALLAH, EBN-ZOBEIR, l. 4, Heg. 63.

ABDAS, in *Biography*, a Persian bishop of the fifth century, who deserves to be exhibited in the page of history as a cautionary example of the folly of supporting any cause by persecution. Having destroyed a pagan temple belonging to the worshippers of fire, the king of Persia, instigated by the Magi, ordered him to rebuild it at his own charge; but as he refused to comply with this order, a dreadful persecution was commenced against the Christians, which lasted 30 years; and in this persecution Abdas lost his life. Bayle.

ABDOMINAL RING. For OBLIQU, &c. *r.* OBLIQUUS.

ABELICEA, in *Botany*, Ἀβελικία in modern Greek, see our ninth species of ULMUS.

ABERAERON, in *Geography*, a small town and port of Cardiganshire, much frequented by small coasting-vessels, which convey the corn and other produce of the district to the

the English markets. The harbour has been lately much improved by the construction of a pier. A market has been lately established here.

ABEREMOA, in *Botany*, altered by Aublet from the Caribbean appellation of the same plant, Aubl. Guian. 610. t. 245; see *GUATTERIA* hereafter.

ABERPORTH, in *Geography*, a little fishing-town of Cardiganshire, pleasantly situated at the entrance of the river which flows by Blaenporth. The craft belonging to this port are chiefly employed in bringing lime-stone from Pembrokehire and other parts, which are burnt here, to supply the neighbourhood with manure, and for other purposes.

ABILDGARDIA, in *Botany*, a genus of Professor Vahl's, dedicated by him to the memory of the late Peter Christoph Abildgaard, a native of Denmark, formerly professor of the veterinary art, who contributed much information to Professor Rottböll on the subject of Grasses. Mr. Brown retains this genus, not without a hint of its too near affinity to *FIMBRISTYLIS*; see that article. We trust the barbarism of the double *a* may be dispensed with, and we have ventured to make that alteration.—Vahl Enum. v. 2. 296. Brown Prodr. Nov. Holl. v. 1. 229.—Clafs and order, *Triandria Monogynia*. Nat. Ord. *Calamaria*, Linn. *Cyperoides*, Juss. *Cyperaceæ*, Brown.

Gen. Ch. *Cal.* a single scale to each flower, ovate, pointed, concave, compressed, forming a spike, imperfectly two-ranked. *Cor.* none. *Stam.* Filaments three, rarely but one, inserted beneath the germen, gradually elongated by age, anthers linear, longer than the filaments. *Pist.* Germen superior, acutely triangular, rather contracted at the summit; style bulbous and pyramidal at the base, the bulb triangular, broader than the germen, permanent, the upper part bristle-shaped, deciduous; stigmas three, shorter than the style. *Peric.* none. *Seed* one, snow-white, nearly pear-shaped, with three angles, contracted at the base, crowned at the summit with the pointed base of the style, convex at the sides, and rough with minute dots, without any surrounding bristles. *Recept.* thread-shaped, gradually elongated, minutely cellular, dotted with brown, the edges of the cells membranous, from the permanent bases of the scales.

Eff. Ch. Glumes chaffy, imbricated, imperfectly two-ranked. Corolla none. Style three-cleft, with a triangular, pointed, permanent base. Seed solitary, pear-shaped, triangular, without any bristles at its base.

The stems of this genus are angular, slender, without joints; leafy at the bottom. Leaves narrow, channelled, sheathing. Spikes ovate-oblong, acute, compressed, often twisted; their scales closely imbricated, keeled, very smooth and polished, white, dotted with purple, the green keel of each elongated into a little point; the two lowermost narrower than the rest. *Vahl. Brown.*

Mr. Brown remarks, that the style is certainly deciduous, and the spike, when in seed, by no means perfectly two-ranked; circumstances which bring the present genus very near to *Fimbristylis*. The following are the only described species.

1. *A. monostachya*. Single-spiked *Abildgardia*. Vahl n. 1. Br. n. 1. (*Cyperus monostachyos*; Linn. Mant. 180. Willd. Sp. Pl. v. 1. 271. Swartz Obf. 29. Rottb. Gram. 18. t. 13. f. 3. *Græmen cyperoides minimum, spica simpliciter compacta, radice tuberosa odorata*; Sloane Jam. v. 1. 120. t. 79. f. 2.)—Spike solitary. Scales uniform, nearly all ferrug.—Gathered, by Kœnig, in shady situations in the East Indies; in the pastures, and sea marshes,

of Jamaica and Hispaniola, by Sloane and Swartz; and in the tropical part of New Holland, as well as at Port Jackson, by Mr. R. Brown. The root appears to be perennial, with many long simple fibres. Herb slender, smooth and glaucous, forming tufts, about a foot high, with linear, very narrow, leaves, which sometimes break off, as Vahl remarks, at a sort of joint, below the middle of each. Stem simple, slender, angular, and striated, taller than the leaves. Spike half an inch long, two-ranked, subtended by a linear rough-edged leaf, sometimes, in the Linnæan specimen, exceeding its own length. The glumes, or scales, have a green keel, accompanied by two white ribs, next to which is an assemblage of purple dots, the rest being cream-coloured. Two or three of the lower glumes are small, and apparently barren. There is said to be but one flamen to each flower. Sloane's synonym seems, to us, doubtful.

2. *A. schoenoides*. Rushy *Abildgardia*. Br. n. 2.—“Spike solitary, naked. Outer scales shorter and barren; terminal ones narrower, with spreading points.”—Gathered by Mr. Brown, in the tropical part of New Holland. We have seen no specimen of this or the next.

3. *A. vaginata*. Sheathing *Abildgardia*. Br. n. 3.—“Spikes about three together; the middle one sessile. Scales pointed. Stem bristle-shaped, angular, keeled; sheathed at the base.”—Found by Mr. Brown, in the tropical part of New Holland.

4. *A. tristachya*. Three-spiked leafy *Abildgardia*. Vahl n. 2. (*Cyperus triflorus*; Linn. Mant. 180. Willd. Sp. Pl. v. 1. 272. *Schoenus cyperoides*; Retz. Obf. fasc. 4. 8.)—Spikes about three together; the middle one sessile. Stem semi-cylindrical; round, bulbous, and leafy, at the base.—Native of the East Indies, in hard dry ground. *Kœnig*. The stems are from one to two feet high, rushy and rigid, erect; according to Vahl, bulbous at the bottom, and wrapped with dry brown sheaths among the foliage. The leaves are smooth, channelled, not so tall as the stem. Spikes two, three, or four, twice the size of the first species, tumid, ovate, acute, twisted, of a dirty but polished white; three of them generally springing from one short leafy sheath, the two lateral ones elevated on long, flattened, striated, smooth stalks. Stamens three; *Vahl*. Stigmas long and downy.

ABINGTON, in *Geography, a town of Massachusetts, in Plymouth county, containing 1704 inhabitants.—Also, a township of Pennsylvania, in Montgomery county, having 1236 inhabitants.—Also, a township of Pennsylvania, in Luzerne county, having 511 inhabitants.*

ABLATIVE ABSOLUTE. Subjoin, See Lowth's Grammar, p. 134.

ABOU HANNES. *Dele* See Plate I. Birds.

ABOU HANIFAB. See HANIEAH.

ABOU-RIBAN, in *Biography*, a geographer and astrologer, was born at Beroun, in the province of Khovarezm, at the commencement of the 11th century, and on account of his skill in sciences, denominated *Al Mohakabad*, the very sensible philosopher. He wrote a “Treatise on Geography,” a “Theory of the Fixed Stars,” a “Treatise on the Sphere,” and an “Introduction to Judicial Astrology.” *D'Herbelot* Bib. Orient.

ABRAHAM. Line 25, insert *Ante* A.D. 1921. Col. 2. l. 56, instead of A.D., and col. 3. l. 34, instead of A.D. insert B.C.

ABRONIA, in *Botany*, Juss. Gen. 448. See *TRICRATUS*.

ABSCISS under the Cranium, insert *and*.

ABUCCO. Subjoin, See *WEIGHT*.

ABUSCHÆHRR. See BUSHEER.

ABUTA, in *Botany*, a Brazilian name, first published by Barre, adopted by Aublet, and recently by De Candolle, as well as Juskieu. It may remain for the present, till the characters of the genus are known. There are hitherto involved in great uncertainty, the flowers not having been observed by any botanist.—Barr. Hist. Nat. de la France Equinoxiale, 1. Aubl. Guian. 618. Juss. 286. De Cand. Syst. v. 1. 542.—Clas and order, *Diocia Dodecandria?* (Juss. Polygamia, Aubl.) Nat. Ord. *Menispermata*.

Efl. Ch. Male, unknown.

Female, Fl. unknown. Berries two or three, ovate, somewhat compressed, dry, single-seeded.

Lamarck and Willdenow have considered this genus as not distinct from *MENISPERMUM*, see that article; but Professor De Candolle reckons the large, dry, ovate, not kidney-shaped, berries, so termed, we presume, because of the brittle shell of their seed, as affording a sufficient character, even without the flowers. He is more inclined to refer *Abuta* to his own genus of *Cocculus*, separated by him from *Menispermum*; but their habits are somewhat different. Two species of *Abuta* are defined by this writer, but *A. amara* of Aublet, Guian. 620. t. 251, is referred, on the authority of Richard, to *Aristolochia*. These are large twining shrubs, with ovate leaves, whose pinnate ribs spring nearly from one point at the base.

1. *A. rufescens*. Reddish *Abuta*, or False Pareira-brava. Aubl. Guian. 618. t. 250. De Cand. n. 1. (*A. scandens*, amplifimo folio cordiformi, subtus tomentoso; Barr. Fr. Equin. 1. *Menispermum Abuta*; Lamarck Dict. v. 4. 100. Willd. Sp. Pl. v. 4. 828.)—Leaves ovate, acute, entire; and downy beneath.—Native of woods in Brazil, Cayenne, and Guiana. Aublet found it in almost every forest of the last-mentioned country, that he examined, bearing fruit in January. The Portuguese confound this plant with the true *Cissampelos Pareira*, and consider its root of equal efficacy in jaundice, disorders of the kidneys and bladder, as well as internal abscesses, and menstral suppressions. The climbing stem, and downy branches, reach to the tops of trees, and bear large, alternate, stalked, coriaceous, veiny, entire leaves, from four inches to a foot long; smooth above; covered beneath with prominent, reticulated, downy veins, springing copiously from five principal ribs, which radiate from nearly the base of the leaf. The footstalks are about half the length of the leaves, round, finely and densely downy. Berries elliptical, downy, an inch long, three upon each receptacle, and forming large axillary branches. There is said to be a variety whose woody parts, as well as the pubescence of the foliage, is reddish. The Creoles make a decoction of the branches of the red and white varieties indifferently, to cure obstructions of the liver, to which they are very subject. Aublet.

2. *A. candicans*. Whitish-leaved *Abuta*. De Cand. n. 2. Richard MSS.—“Leaves ovate, pointed, somewhat crenate, or minutely lobed; smooth and whitish beneath.”—Gathered in Cayenne by M. Richard, who unluckily did not meet with the flowers. The branches are round and smooth. Footstalks four inches long, round and smooth likewise. Leaves five to seven inches long, three or four broad, nearly entire, or slightly crisped, or toothed, in the margin; even and smooth above; pale or nearly white underneath, but, as it seems, quite smooth; the ribs pinnate, the two lower lateral ones close together. The inhabitants of Cayenne call this plant *Liane amère*, Bitter Vine. De Candolle.

ABYSSINIAN MUSIC. See MUSIC.

ACACIA, in *Botany*, an ancient Greek name, derived

from *ακαζα*, to point or sharpen, in reference to its thorny habit. De Théis deduces all words of this etymology from the Celtic, *ac*, a point. The *ακαζια* of Dioscorides, book i. chap. 133, was a sort of Egyptian thorn, “of a diffuse or spreading mode of growth, with a white flower, and a pod resembling lupines.” Its expressed juice, dried in the shade, was an astringent medicine much in use, and the shrub yielded also a clear white gum. This may very well have been a plant of the present genus. Willdenow, who established this genus, first separated it from the Linnæan *MIMOSA* (see that article), which has become inconveniently numerous in species, and unquestionably is capable of division by the characters of the fruit, of which Willdenow has very well taken advantage. He leaves in *Mimosa* such species as have a *lomentum*, or legume separating into single-seeded joints. Of these he defines 32, having a five-toothed corolla, and only eight stamens; and to many of them, being sensitive, the name *Mimosa* is properly appropriated. For his other genera taken from hence, see *DESMANTHUS*, *INGA*, and *SCHRANKIA*. We must observe however that the *Acacia* of Tournefort is not analogous to what is now before us.—Willd. Sp. Pl. v. 4. 1049. Ait. Hort. Kew. v. 5. 459. Pursh 305.—Clas and order, *Polygamia Monocia*, or rather perhaps *Polyandria Monogynia*. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Juss.

Efl. Ch. Calyx five-toothed. Corolla five-cleft. Stamens indefinite, from four to an hundred. Pistil one. Legume of two valves. Some flowers male.

Obf. The flowers, sometimes four-cleft, have, in some instances, a corolla which separates into four or five distinct petals. We have not had an opportunity of examining a sufficient number of species to give a full generic character. Willdenow reckons up 102, in seven sections; to which Mr. Brown has made numerous additions from New Holland, partly described in *Ait. Hort. Kew.* above cited. We shall give some examples of each section.

SECT. 1. *Leaves simple*. Sixteen species in Willdenow, to which ten are here added, nine of them from *Hort. Kew.*—Of this singular tribe, first discovered by our British circumnavigators, all the species, as far as hitherto known, bear, in a feeding state, compound pinnate leaves, soon replaced by leafy or spinous simple footstalks, which latter constitute the only foliage of the adult plant. There are no proper thorns or prickles in these. Their stem is shrubby, or arborescent, as well as throughout the whole genus. We have slightly adverted to this section at the end of our article *MIMOSA*.

A. verticillata. Whorl-leaved *Acacia*. Willd. n. 1. Ait. n. 1. (*Mimosa verticillata*; L'Herit. Sert. Angl. 30. Curt. Mag. t. 110. Venten. Malmaif. t. 63.)—Leaves whorled, linear-awlshaped, rigid, spinous-pointed. Spikes solitary, cylindrical.—Gathered in Van Diemen's island, by the late Mr. David Nelson, who sent seeds to Sir Joseph Banks in 1780. Hence this singular shrub became known in the English green-houses, where it flowers in the spring, and ripens seed. The first two or three leaves of feeding plants are conjugate and pinnate, with elliptical obtuse entire leaflets: the rest are accurately whorled, simple, pungent, flattish thorns rather than leaves, six or eight in each whorl, about half an inch long, somewhat unequal, spreading horizontally. Flowers in dense, yellow, thick, obtuse spikes, which are an inch, more or less, in length, each on a simple, slender, axillary stalk, but there are sometimes two or more of these stalks together. Legume linear, compressed, corrugated, of one cell with several kidney-shaped seeds.

A. juniperina. Juniper-leaved *Acacia*. Willd. n. 2. Ait. n. 2. (*Mimosa juniperina*; Venten. Malmaif. t. 64. “*M. ulicifolia*;

ACACIA.

« *M. ulicifolia*; Wendl. Coll. 25. t. 6." Willd.)—Leaves imperfectly whorled, linear-awlshaped, rigid, spinous-pointed. Spikes solitary, globose.—Found near Port Jackson, New South Wales, from whence fir Joseph Banks is said to have received seeds about the year 1790. We have specimens from Dr. White. This differs from the foregoing in having its spinous leaves more crowded, and less distinctly whorled, more hairy branches, and globular heads of flowers, each flower, according to Ventenat, accompanied by a little ovate, pointed, stalked bractea.

A. acicularis. Needle-leaved Acacia. Brown in Ait. n. 3.—"Leaves scattered, roundish-awlshaped, pointed, rigid. Stipulas deciduous. Young branches smooth. Spikes solitary, globose."—Said to have been found in New South Wales, by colonel William Paterson, from whence it was sent to Kew in 1796. It flowers at the same season as the two preceding, and requires the same treatment. If we understand this species aright, the leaves are full an inch long, being twice the length of the two foregoing, and more slender. We received specimens answering to this description before 1796, from Dr. White.

A. fulcata. Furrowed Needle Acacia. Brown in Ait. n. 4.—"Leaves thread-shaped, furrowed on all sides, with a harmless point. Heads of flowers usually in pairs. Bracteas ovate, concave, permanent, at the base of the flower-stalk. Legumes zigzag."—Observed by Mr. Brown on the south-west coast of New Holland, from whence it was introduced, in 1803, by Mr. Peter Good. This is likewise a green-house shrub, flowering from May to August.

A. suaveolens. Sweet-scented Acacia. Willd. n. 4. Ait. n. 5. (Mimosa suaveolens; Sm. Tr. of Linn. Soc. v. 1. 253. Labill. Nov. Holl. v. 2. 87. t. 236. M. angustifolia; Jacq. Hort. Schoenbr. v. 3. 74. t. 391. M. obliqua; Lamarck Journ. d'Hist. Nat. v. 1. 89. t. 5.)—Leaves linear, pointed; tapering at the base. Clusters oblong, axillary. Flowers four-cleft. Branches triangular.—Native of New South Wales. Cultivated before 1790, by Mr. Thomas Hoy, in Sion gardens. A green-house shrub, flowering in the spring. The acute edges of the branches are bright red. The first leaves are conjugate, pinnate, with thick elliptical leaflets, and a lanceolate common footstalk; the rest alternate, narrow, coriaceous, four or five inches long, rather glaucous, smooth, thick-edged. Flowers simply racemose, yellowish-white, fragrant, their corolla deeply four-lobed. Stamens very numerous. Legume elliptical, an inch and a half or two inches long, and one inch broad, finely glaucous.

A. striata. Double-headed Acacia. Willd. n. 8. Ait. n. 8. (Mimosa striata; Andr. Repof. t. 53. Curt. Mag. t. 1121.)—Leaves linear-obovate, obtuse; tapering at the base. Spikes globose, stalked, axillary, in pairs, divaricated.—Native of New South Wales, from whence fir Joseph Banks is recorded to have received seeds in 1790. This requires the same treatment, and flowers at the same time, as the last, from which its capitate five-cleft flowers, and more dilated rounded-pointed leaves, at once distinguish it. Dr. Sims, in Curtis's Magazine, under this species, has given but too just reasons for retaining the genus *Mimosa* entire for the present, which principally refer to our ignorance of their fruit in a number of instances. Our learned friend, however, has since conformed to the new arrangement; and we think, with Willdenow, that enough is known for us to venture on the division this author has proposed, which may generally be supported by analogy, if not by absolute demonstration.

A. melanoxylon. Black-wooded Acacia. Brown in Ait. n. 12. Curt. Mag. t. 1659.—Leaves elliptic-lanceolate,

many-ribbed, slightly falcate. Spikes globose, in short clusters. Flower-stalks and young branches angular, powdery. "Umbilical cord coloured, plaited, nearly surrounding the seed."—Found by Mr. Brown, in Van Diemen's island. From him we adopt the singular character of the umbilical cord. This is a considerable tree, raised by John Walker, esq. of Arno's Grove, Southgate, who received the seeds under the name of Black-wood, about the year 1808. The young twigs are covered with rusty mealiness. Leaves stalked, three inches long, and one broad, slightly glaucous, usually five-ribbed. Flowers pale-yellow, their globular spikes disposed in short axillary clusters, about twice the length of each footstalk. We have no account of the legume.

A. Sappora. Sophora-podded Acacia. Br. in Ait. n. 13. (Mimosa Sappora; Labill. Nov. Holl. v. 2. 87. t. 237.)—Leaves oblong-obovate, equilateral, many-ribbed. Spikes cylindrical, axillary, in pairs. Petals four. Legumes linear, curved, pointed. Umbilical cord plaited.—Found by Labillardiere, as well as by Mr. Brown, in Van Diemen's island. Its seeds were brought by the latter to Kew Garden, and raised there in 1805, but the plants have not yet bloomed. The young leaves are represented by Labillardiere as pinnate and trijugate; the rest ovate, two or three inches long. Spikes nearly sessile, hardly an inch long, and very slender. Flowers small. Legumes five or six inches in length, tumid, and twisted, a quarter of an inch broad. Each seed is subtended by a cup-like tunic, which we presume is the umbilical cord of Mr. Brown.

A. marginata. Marginate-leaved Acacia. Br. in Ait. n. 14.—"Leaves oblong-lanceolate, rather falcate, bordered, single-ribbed; their anterior edge somewhat narrowed, with a solitary gland. Heads about four-flowered, disposed in clusters."—Observed by Mr. Brown on the south-west coast of New Holland, from whence seeds were sent in 1803, by Mr. Peter Good. A green-house shrub, flowering from April to June. Aiton.

A. myrtifolia. Myrtle-leaved Acacia. Willd. n. 14. Ait. n. 15. (Mimosa myrtifolia; Sm. Tr. of Linn. Soc. v. 1. 253. Bot. of New Holl. 51. t. 15. Curt. Mag. t. 302.)—Leaves elliptic-lanceolate, oblique, thick-edged, single-ribbed, with a solitary gland at their anterior margin. Heads of flowers clustered, aggregate.—Native of New South Wales. Raised by Mr. Thomas Hoy, before the year 1789. A green-house shrub, flowering from February to May, or late in autumn. The stem is three or four feet high, with angular branches. First leaves conjugate, pinnate; the rest about two inches long, broadly lanceolate, pointed, very rigid, somewhat glaucous, often wavy, smooth. Flowers pale yellow, fragrant, three or four in each round head, the heads disposed variously in somewhat compound axillary clusters, nearly equal in length to the leaves. Legume linear, curved, tumid, with very thick edges.

A. hispidula. Little harsh Acacia. Willd. n. 15. Ait. n. 16. (Mimosa hispidula; Sm. Bot. of New Holl. 53. t. 16.)—Leaves elliptical, acute, oblique, minutely toothed, rough on each side and at the margin. Young branches harsh. Flowers four-cleft, in solitary axillary heads.—Native of New South Wales, from whence specimens were sent to us, with coloured drawings, in 1794, and seeds about the same time to fir Joseph Banks. The roughness of the foliage and branches is very remarkable, caused by short, rigid, prominent hairs, or points. The leaves are sessile, an inch long, vertical, very stiff, deep-green. Heads stalked, globose, many-flowered. Legume thick-edged, elliptic-oblong, sometimes with one or two contractions. Seeds few,

A. bafulata,

ACACIA.

A. hastulata. Little Halberd-leaved Acacia.—Leaves deltoid, spinous-pointed, roughish; their upper angle glandular. Stipulas bristle-shaped, permanent. Branches rough. Flowers in solitary axillary heads.—Gathered near King George's found, on the south-west coast of New Holland, by Mr. Menzies, to whom we are obliged for a specimen. This remarkable new species is evidently allied to the two last-mentioned, though abundantly distinct from both. The shrubby stem bears numerous, erect, round, rough, wand-like branches, beset with innumerable, spreading, vertical leaves, about a quarter of an inch long, single-ribbed, unequally deltoid, with an elongated spinous point, thick-edged, rough with minute points; their lower angle either rounded or somewhat toothed; the upper more prominent, and tipped with a gland. Stipulas slender, erect, in pairs at the base of each leaf. Flowers three or four in each of the little stalked heads, which are very numerous all along the branches.

A. decipiens. Paradoxical Acacia. Br. in Ait. n. 17. Curt. Mag. t. 1745. (Mimosa decipiens; König in Ann. of Bot. v. 1. 366. t. 8. Adiantum truncatum; Burm. Ind. 235. t. 66. f. 4. Linn. Syst. Veg. ed. 13. 790.)

Leaves triangular-wedge-shaped, spinous-pointed, smooth; their upper angle glandular. Stipulas bristle-shaped, deciduous. Branches smooth. Flowers in solitary axillary heads.—Gathered by Mr. Menzies on the south-west coast of New Holland, and not on the west side of North America, as mentioned in the Annals of Botany. Seeds were sent to Kew in 1803, by Mr. Good, and the plant is marked by Mr. Aiton as a green-house shrub, flowering from March to June. Its history is certainly curious; specimens without flowers having been taken by professor Burmann, who misled Linnæus, for an *Adiantum*, which error was detected by the late Mr. Dryander, on seeing Mr. Menzies's specimens. Those of Burmann were reported to have come from Java, in which there may be a further mistake. At any rate this plant is nearly related to our last-described, and grows in the same country. The leaves differ in being larger, half an inch to an inch long, erect, and differently shaped, their inner, or upper, glandular angle being greatly extended, while the lower or rounded angle, seen in *A. hastulata*, is wanting. The flowers are more numerous, from seven to ten, in each round head.

A. biflora. Two-flowered Acacia. Br. in Ait. n. 18.—“Leaves triangular; the outer angle spinous; inner glandular. Stipulas bristle-shaped and spinous, permanent. Young branches downy. Heads two-flowered.”—Observed by Mr. Brown, on the south-west coast of New Holland, from whence it was sent to Kew by Mr. Good, in 1803. A green-house shrub, flowering from March to June. We have seen no specimens.

A. armata. Simple-leaved prickly Acacia. Br. in Ait. n. 19. Curt. Mag. t. 1653.—“Leaves oblong, halved, smooth, with a small point; their solitary rib near and parallel to the somewhat abrupt interior margin. Stipulas spinous. Heads solitary, globose. Branches hairy.”—Observed by Mr. Brown, on the south coast of New Holland. Sent to Kew, by Mr. Good, in 1803. A green-house shrub, flowering from April to June. Leaves dark green, an inch long, sessile. Flowers yellow, numerous.

A. alata. Wing-stalked Acacia. Br. in Ait. n. 20.—“Stem winged on two sides. Leaves decurrent, single-ribbed, tipped with a small spine; their inner margin with one glandular tooth. Stipulas spinous. Heads stalked, mostly solitary.”—Gathered by Mr. Brown, on the south-west coast of New Holland, from whence seeds were sent to Kew, by Mr. Good, in 1803. This is likewise a shrubby green-house plant, flowering from April to July.

Sect. 2. *Leaves conjugate, pinnate.* Seven species in Willdenow, to which one of Mr. Brown's is to be added from Hort. Kew. The *Prodrromus* of this able author, when completed, will probably furnish more New Holland species to this section.

A. xylocarpa. Wooden-fruited Acacia. Willd. n. 17. (Mimosa xylocarpa; Roxb. Corom. v. 1. 68. t. 100.)—Leaves conjugate, pinnate; leaflets four pair, ovate-oblong, acute. Heads globose, many-flowered, lateral, stalked, in pairs.—Native of the mountainous parts of the Circars of Hindoostan, casting its leaves during the cold season, and flowering when the hot weather begins. This is one of the largest trees of this genus or any of its allies; the timber very hard, of a chocolate colour towards the centre, and much esteemed for purposes where hardness, toughness, and durability, are requisite, as in ploughs, the natives seldom using iron in that implement. The leaves are large, smooth, paler beneath, consisting of two divisions, or wings, and those of four pair of leaflets each, except that the innermost leaflet on each side, at the bottom, is wanting: the lower leaflets are about two inches long; the upper four or five. Heads of flowers whitish, the size of a cherry, on simple stalks, two or three inches in length. Corolla bell-shaped, five-cleft. Stamens ten. Legume only one from each head, ovate, compressed, very large and woody, three or four inches long, the stalk becoming necessarily greatly thickened. Seeds about ten, oval, ranged near the lower edge, as large as kidney-beans.

A. pulchella. Zigzag Spiny Acacia. Br. in Ait. n. 22.—“Leaves conjugate, pinnate, with a stalked gland between the wings, each of which has from five to seven pair of leaflets. Stipulas spinous, nearly equal to the leaves. Heads solitary. Branches zigzag.”—Observed by Mr. Brown, on the south-west coast of New Holland, from whence seeds were sent to Kew, in 1803, by Mr. Good. A green-house shrub, flowering from April to July.

Sect. 3. *Leaves doubly pinnate. Stem without thorns. Spikes oblong.* Eleven species in Willdenow, the last of which, *A. Houlytoni*, we shall remove to the following section.

A. muricata. Warty Acacia. Willd. n. 25. (A. latifolia alpeucuroides, flore albo; Plum. Ic. 6. t. 11. Mimosa muricata; Linn. Sp. Pl. 1504.)—Thorns none. Leaves doubly pinnate; first division of five pair; second of many pair; leaflets abrupt. Spikes axillary, aggregate, nearly cylindrical. Branches warty.—Gathered in South America, or the West Indies, by Plumier, whose figure is the only authority for this species. The branches are round, and warty, as well as the lower part of the flower-stalks, which last are evidently axillary, not, as Willdenow says, terminal. They are longer than the large compound leaves, and bear four or five alternate dense spikes, on partial stalks. Leaflets numerous, crowded, elliptical, veiny, emarginate, about a half or three-quarters of an inch long. Flowers numerous, very small. Legumes several, spreading, four or five inches in length, linear, flat, veiny, wavy at the edges, with many oval flat seeds.

A. pallida. Pale South-American Acacia. Willd. n. 26.—“Thorns none. Leaves doubly pinnate; first division of two pair; second of twelve pair; leaflets linear, obtuse, downy. Spikes thread-shaped, much longer than the leaves.”—Gathered by Humboldt and Bonpland, in South America. Branches round, warty, divaricated. Leaflets obtuse at each end, sometimes but ten pair; clothed sparingly on the upper side, more densely on the under, with fine pubescence; the edges fringed. There is a cup-shaped sessile gland between the secondary divisions of each leaf (indications of which appear likewise in Plumier's plate of the foregoing).

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Footstalks hairy. *Spikes* axillary, solitary, three or four inches long, being thrice the length of the leaves. *Flowers* opposite, of five petals. *Willdenow.*

This seems most allied to the last, but the shape and downiness of the leaflets, and the solitary spikes, indicate a sufficient difference.

A. areolata. Sand Acacia. Willd. n. 29.—“Thorns none. Leaves doubly pinnate; first division of six pair; second of sixteen pair; leaflets linear, acute. Spikes thread-shaped, in pairs.”—Found by Mr. Bredemeyer at the Carracas, about the sandy banks of rivers. A shrub ten or twelve feet high, with angular downy branches. *Leaflets* fringed, from sixteen to twenty-four pair. *Footstalks* clothed with hoary down; the partial ones accompanied by an acute intermediate gland. *Spikes* axillary, measuring three or four inches, generally rather longer than the leaves. *Flowers* opposite, white, fragrant. *Calyx* with four or five teeth. *Corolla* in four or five deep segments. *Stamens* twice as many, and thrice as long. *Willdenow.*

A. guianensis. Guiana Acacia. Willd. n. 32. Ait. n. 25. (*Mimosa guianensis*; Aubl. Guian. 938. t. 357.)—Thorns none. Leaves doubly pinnate, each division of about ten pair; leaflets elliptical, obtuse. Common footstalk with a convex gland. Spikes thread-shaped, axillary.—Observed by Aublet in Cayenne and Guiana, flowering in November, and bearing ripe seeds in January and February. This is a large tree, whole trunk, thirty or forty feet high, is a foot or more in diameter, with a smooth grey bark, and white brittle wood; the branches widely spreading. *Leaflets* elliptical, about half an inch long. The first divisions of the leaves are sometimes not more than seven or eight. *Stipulas* rounded, deciduous. *Spikes* axillary, from two to five together, on square simple stalks, the flowers small and densely crowded. *Calyx* with five teeth. *Corolla* of one petal, in five sharp lobes. *Stamens* ten, inserted into the calyx below the corolla, long, slender, with heart-shaped anthers, each of which bears a little leafy stalked appendage. *Legume* linear-oblong, flattish, brown, smooth, three or four inches in length, with several seeds.

A. lophantha more properly belongs to this section, though placed in the next.

SECT. 4. *Leaves* doubly pinnate. *Stem* without thorns. *Spikes* globose. Thirty-one species in Willdenow, to which we have three to add, besides *A. Houstoni*.

A. ciliata. Ciliate-winged Acacia. Br. in Ait. n. 23.—“Without thorns, hairy. Leaves doubly pinnate; first division of two pair; second of two or three pair. Stipulas nearly setaceous, deciduous. Heads solitary.”—Gathered by Mr. Brown, on the fourth-well coast of New-Holland; and sent to Kew, by Mr. Good, in 1803. A green-house shrub, flowering from March to June, of which we have not seen either specimen or figure.

A. nigricans. Unequal-winged Acacia. Br. in Ait. n. 24. (*Mimosa nigricans*; Labill. Nov. Holl. v. 2. 88. t. 238.)—Without thorns, smooth. Leaves doubly pinnate; first division of two pair; second of two or three pair in the lower, and from five to seven pair in the upper. Stipulas slender-awlshaped. Heads solitary.—Native of the fourth-well coast of New-Holland, from whence Mr. Good sent seeds to Kew, in 1803. A green-house shrub, flowering from May to July, said to be about six feet high in a wild state. The leaflets are uniform, elliptical, obtuse, one-third of an inch long. Heads axillary, stalked, one, two, or three together. *Corolla* deeply five-cleft. *Stamens* about 150. *Legumes* one or two from each head, linear-oblong, one inch and a half in length, and one-third of an inch in breadth. *Labillardiere.*

A. odoratissima. Fragrant Coromandel Acacia. Willd. n. 37. Ait. n. 27. (*A. non spinosa*, &c.; Pluk. Amalth. t. 251. f. 4. *Mimosa odoratissima*; Linn. Suppl. 437. Roxb. Coromand. v. 2. 12. t. 120.)—Thorns none. Leaves doubly pinnate; first division of four pair; second of ten or twelve pair; leaflets obtuse, the lowermost very minute. Heads panicled, terminal.—Native of the mountainous parts of the coast of Coromandel, flowering in the hot season. The wood is hard, and equally useful with that of *A. xylocarpa*. (See Sect. 2.) The leaves are a span long, with uniform leaflets, an inch in length, glaucous beneath, very unequal at their base. *Flowers* numerous, white, highly fragrant, in numerous, aggregate, stalked, globular heads. *Legume* coriaceous, about six inches in length, and one in breadth, with a central row of seeds.

A. arborea. Rough Tree Acacia. Willd. n. 38. Ait. n. 28. (*A. non spinosa jamaicensis*, foliis latâ basi in metæ formam fastigiatis; Pluk. Almag. 6. t. 251. f. 2. *A. arborea maxima non spinosa*, pinnis majoribus, flore albo, filiquâ contortâ coccineâ ventricosâ elegantissimâ; Sloane Jam. v. 2. 54. t. 182. f. 1, 2. *Mimosa arborea*; Linn. Sp. Pl. 1503. Swartz Obf. 390. Browne Jam. 252. n. 3?)—Thorns none. Leaves doubly pinnate; first division of seven pair; second of seventeen pair; leaflets halved, acute. Heads axillary, stalked. *Legume* contorted, tumid. Seeds spherical.—Native of fields and woods in Jamaica, where it is called Wild Tamarind, and is one of the largest trees of that island. The wood, according to Sloane, is durable, though soft and white. *Leaves* of numerous, small, dark-green, smooth leaflets. *Heads* globular, of numerous sweet-scented flowers, whose corolla is reddish, the stamens whitish, very long. *Legume* as if beaded, four or five inches long, red; its valves of a blood-red on the inside. *Seeds* globular, of a shining black. This species was cultivated by Miller, but is now unknown in our gardens, nor are botanists in general well acquainted with it; Forskall and Thunberg having given the name of *Mimosa arborea* to two plants very different from this, as well as from each other.

A. Julibrissin. Smooth Tree Acacia. Willd. n. 39. Ait. n. 29. (*Mimosa Julibrissin*; Scop. Infubr. v. 1. 18. t. 8. Ait. ed. 2. v. 3. 440. *M. arborea*; Forsk. Ægypt.-Arab. 177. Gmel. It. v. 3. 372. t. 40.)—Thorns none. Leaves doubly pinnate; first division of about ten pair; second of many pair; leaflets halved, obtuse with a point. Heads lax, aggregate, terminal. *Legume* flat, membranous, smooth.—Native of the Levant. Forskall saw it cultivated at Constantinople, where it was called *Djal ibrazim*, by the Turks; which name, denominating a silky flower, in allusion to the stamens, appears to be the origin of the specific appellation chosen by Scopoli. We have seen this species as large as a common apple-tree, covered with a profusion of blossoms, in the open ground at Turin, nor could any thing be more elegant or splendid. In England it is usually treated as a green-house plant, and flowers sparingly; though it succeeds well against a wall, with some protection in winter. The leaves are large and spreading, of numerous leaflets, half an inch long, very unequal in their two halves. *Flowers* lilac, with long monadelphous stamens, forming most beautiful tassels like white silk. *Legume* half a foot long, thin, pale brown, corrugated, unequal in breadth, with many small flattish seeds.

A. villosa. Downy Jamaica Acacia. Willd. n. 46. (*Mimosa villosa*; Swartz Prodr. 85. Ind. Occ. 982.)—Thorns none. Leaves doubly pinnate; first division of five or six pair; second of many pair; leaflets elliptical, oblique, downy. Stalks and branches hairy. Heads rather oblong,

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oblong, panicled, terminal. Legume hairy, flat.—Found by Dr. Swartz, on mountains in the south of Jamaica. Browne seems by his herbarium to have confounded this with the real *A. arborea*, just described. The present is much smaller, being merely a *shrub*, six feet high, with hairy furrowed branches. Leaflets downy on both sides, smaller and more obtuse than in the *arborea*; glaucous underneath; from ten to twelve pair in each subdivision. Clusters terminal, composed of many oblong and obtuse, rather than globular spikes, on very hairy stalks. Flowers small, white, with numerous capillary stamens, of a tawny hue, inserted into the lower part of the receptacle. Legume short, very different from that of *arborea*.

A. difcolor. Two-coloured-leaved Acacia. Willd. n. 47. Ait. n. 32. Curt. Mag. t. 1750. (*Mimosa difcolor*; Andr. Repof. t. 235. M. botrycephala; Venten. Hort. Celf. t. 1.)—Thorns none. Leaves doubly pinnate; first division of five pair; second of about ten pair; leaflets lanceolate, pale beneath. Heads in terminal and axillary clusters, much longer than the leaves.—Native of New South Wales, from whence seeds and specimens were among the first brought into this country, in the year 1788. It is now not an uncommon green-house plant in general collections, flowering at various seasons. The branches are angular and zigzag. Leaves rather stiff, their footstalks hairy like the young branches; leaflets not half an inch long, acute, smooth; dark green above; very pale beneath. Flowers yellow, in numerous globular heads, disposed in very conspicuous long clusters.

A. pubescens. Hairy-stem'd Acacia. Br. in Ait. n. 33. (*Mimosa pubescens*; Venten. Malmalf. t. 21. Curt. Mag. t. 1263.)—Thorns none. Branches hairy. Leaves doubly pinnate; first division of about eight pair; second of about fifteen pair; footstalks without glands; leaflets obtuse. Heads in axillary clusters, longer than the leaves.—Native of New South Wales, from whence its seeds are said to have been procured by Sir J. Banks, about the year 1790. This pretty delicate species has an arborescent stem, with drooping branches, and its copious fern-like foliage exhibits a most elegant appearance. Both sides of the leaflets are of a similar bright green. The whole compound leaf measures usually two inches; the numerous clusters of yellow capitate flowers, which smell like new hay, being about twice that length.

A. lophantha. Two-spiked New Holland Acacia. Willd. n. 53. Ait. n. 34. (*Mimosa distachya*; Venten. Hort. Celf. t. 20. M. elegans; Andr. Repof. t. 563.)—Thorns none. Leaves doubly pinnate; first division of ten or twelve pair; second of about twenty pair; leaflets lanceolate; top and bottom of the common footstalk glandular. Spikes oblong, axillary, in pairs.—Observed by Mr. Brown, on the south-west coast of New Holland, from whence seeds were sent to Kew, in 1803, by Mr. Good. A tall *shrub*, or perhaps a *tree*, with furrowed warty branches. Leaves large, drooping, dark green, with innumerable narrow smooth leaflets. Spikes stalked, ovate or oblong, not globose, of numerous, crowded, sulphur-coloured flowers, having each about 200 monadelphous stamens. Legume oblong, flat, thick-edged, somewhat constricted here and there occasionally, when the seeds happen to be abortive.

A. brachyloba. Illinois Acacia. Willd. n. 54. Ait. n. 35. Pursh n. 1. (*Mimosa illinoensis*; Michaux Boreal.-Amer. v. 2. 254.)—Herbaceous, without thorns. Leaves doubly pinnate; first division of five to eight pair; second of many pair, with a gland between the lowermost. Heads globose, axillary, solitary. Legumes lanceolate, straight.—In the extensive natural meadows of Illinois and Kentucky, flower-

ing in June and July. Perennial. Flowers white, with only five stamens. Pursh. Stem smooth, furrowed. Leaflets from sixteen to twenty-four pair, linear, acute, slightly fringed at the base. Footstalks nearly smooth. Heads of flowers the size of a pea, stalked. Legume the length of the nail. Willdenow.

A. glandulosa. Glandulous Acacia. Willd. n. 55. Ait. n. 36. Pursh n. 2. (*Mimosa glandulosa*; Michaux Boreal.-Amer. v. 2. 254.)—Venten. Choix. t. 27.)—Herbaceous, without thorns. Leaves doubly pinnate; first division of about twelve pair; second of many pair, with a gland between each. Heads globose, axillary, solitary. Legumes oblong, curved.—On the banks of the rivers Tennessee and Mississippi, flowering in July. Flowers white, pentandrous. Pursh. This appears to be very nearly related to the last. Both are herbaceous, with perennial roots, and have been introduced into the English gardens, but we have not had any account of their success. They require the shelter of a green-house.

A. decurrens. Decurrent Acacia. Willd. n. 56. Ait. n. 37. (*Mimosa decurrens*; Venten. Malmalf. t. 61.)—Thorns none. Leaves doubly pinnate; first division of about eleven pair; partial of innumerable linear leaflets, on a winged stalk, with a gland near the base, on the common stalk. Heads globose, in axillary clusters.—Native of New South Wales. Sir Joseph Banks is said to have introduced this plant at Kew, in 1790. It flowers in the early part of summer, and is a green-house *shrub*, of an elegant fern-like aspect, with strongly angular zigzag branches. The leaves, though their common stalk is subtended by a projection from the branch, are not really decurrent. Flowers yellow, forming short clusters of little round heads.

A. grandiflora. Great Red Acacia. Willd. n. 61. Ait. n. 39. (*Mimosa grandiflora*; L'Herit. Sert. 30. Thornton Illust. t. 4. Andr. Repof. t. 592.)—Thorns none. Leaves doubly pinnate; first division of about fifteen pair; second of very numerous, elliptic-lanceolate, straight leaflets. Heads about five-flowered, in a terminal cluster.—Native of the East Indies, from whence it is said to have been introduced into the English stoves, by Mrs. Norman, about the year 1769. No figure of this stately plant, (Plukenet's synonym, cited by Willdenow, being too uncertain,) had ever appeared, till Dr. Thornton published his magnificent plate. The stem is shrubby, erect, slightly branched, downy, twelve feet or more in height, even in our gardens. Leaves large and spreading, with downy footstalks; their leaflets a quarter of an inch long, slightly fringed, bluntnish, unequal at the base, but not curved or falcate. Clusters solitary, large, terminal, erect, of many alternate stalks, solitary or in pairs, clothed with rusty down, each stalk bearing a head of from four to six flowers, whose corolla is but half an inch long, of a pale greenish-red; but the very numerous stamens, two inches in length, and of a fine shining crimson, like tassels of silk, render this one of the most beautiful of its tribe.

A. Houstoni. Houston's Purple Acacia. Willd. n. 34. Ait. n. 26. (A. americana non spinosa, flore purpureo, staminibus longissimis, filiquis planis villosis, pinnis foliorum tenuissimis; Houft. Ic. ined. t. 20. Mill. Ic. 4. t. 5. Amman. Herb. 584. n. 17. *Mimosa Houstoni*; L'Herit. Sert. 30. Banks Rel. Houft. 12. t. 26. *Gleditsia inermis*; Linn. Sp. Pl. 1509, excluding the synonyms, except Miller's; and place of growth.)—Thorns none. Leaves doubly pinnate; first division of five or six pair; second of very numerous, linear, somewhat falcate leaflets. Heads of few flowers, in a terminal cluster.—Gathered at Vera Cruz, in South America, by Dr. Houston, who sent seeds to Miller,

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in 1729. These produced plants which flowered in the stove at Chelsea. The present species is certainly next akin to the last, however differently its inflorescence may have been described or delineated by authors, in which respect indeed Miller and Houtouin disagree. The plate of the former however has all the appearance of fidelity, and it is possible the partial *flower-stalks* may vary in length, or, more probably, be elongated as the flowers open. Having seen no specimens, we must be guided by the materials before us, from which we gather that the *leaves* of *A. Houfioni* have not half to many *pinne*, and that their *leaflets* are narrower, longer, more acute, and more curved. The *petals* are purple. *Legume* thick-edged, hairy, tapering at the base. The leaf in *Parad. Lond.* t. 64, cited in *Hort. Kew.* appears to belong to this species, but the *flowers*, and perhaps the *legume*, which is smooth, seem those of *A. grandiflora*. If this be the case, the smooth *legume*, not tapering at the base, would be an important addition to the specific character of *grandiflora*.

SECT. 5. *Leaves doubly pinnate. Stipulas becoming spines. Spikes elongated.* Ten species in Willdenow.

A. juliflora. Long-flowered Acacia. Willd. n. 66. Ait. n. 41. (*Mimosa juliflora*; Swartz Prodr. 85. Ind. Occ. 986, printed by mistake *piliflora*. M. diffusa, spica oblonga, filiquis longioribus compressis; Browne Jam. 252. n. 2.)—*Spines* stipulary, in pairs. *Leaves* doubly pinnate; first division of two pair, with intermediate glands; second of about twenty pair of oblong leaflets. *Spikes* axillary, two or three together, cylindrical, pendulous.—Native of very dry fields in the fourth part of Jamaica, flowering in the middle of summer. The *stem* varies from six to thirty feet in height. *Branches* long and spreading. *Spines* strong, four or five lines in length, prominent, curved upwards. *Leaves* spreading, with narrow, obtuse, smooth, ribbed leaflets. *Spikes* two or three inches long, lax, many-flowered. *Flowers* crowded, sessile, very numerous, yellow, sweet-scented. *Corolla* internally hairy. *Stamens* eight or ten, distinct. *Legume* from three to five inches long, compressed, smooth, often twisted, containing several oblong brown seeds, separated by fleshy partitions. There are numerous flowers in each spike destitute of a *pistil*. Cattle feeding on the leaves and young branches, unless gradually accustomed to them, are poisoned, and the sweet legumes are reported to be noxious. The inhabitants of Jamaica call this plant *Cafbezu*. Browne erroneously gives it the name of *Popanax*, which belongs to *Mimosa (Acacia) tortuosa*. Swartz. See Sect. 6.

A. caffra. Hottentot Acacia. Willd. n. 70. Ait. n. 42. (*Mimosa caffra*; Thunb. Prodr. 92.)—*Spines* stipulary, in pairs, incurved. *Leaves* doubly pinnate; first division of twelve pair; second of many pair; with a gland on the footstalk. *Spikes* axillary, cylindrical.—Found by Thunberg in Southern Africa. Sent to Kew in 1800, by W. Somerville, M. D. The *branches* are round and striated. First divisions of the *leaves* from seven to twelve, second from twenty to thirty, pair; *leaflets* linear, obtuse, smooth. *Footstalks* nearly smooth; the common one bearing a depressed gland above its base. *Spike* stalked, two inches long. *Legume* the same length, linear-lanceolate, flat. Willdenow.

A. Catechu. Medicinal Acacia. Willd. n. 73. Ait. n. 44. (*Mimosa Catechu*; Linn. Suppl. 409. Woodv. Med. Bot. 183. t. 66. Roxb. Coromand. v. 2. 40. t. 175. Terra Japonica; Kerr in Med. Obs. et Inq. v. 5. 151. t. 4.)—*Spines* stipulary, hooked, in pairs. *Leaves* hairy, doubly pinnate; first division of ten or twelve pair; second of many pair; with a gland at each extremity of the com-

mon footstalk. *Spikes* cylindrical, axillary, two or three together.—Native of the mountainous parts of Coromandel. A large tree, of which seeds have been sent by Dr. Roxburgh to Sir J. Banks. These have vegetated at Kew, but the plants have not arrived at a flowering state. The *branches* are round, downy when young; the older ones beset with numerous pairs of small recurved thorns, originating in the *stipulas*, as in all the plants of this section. *Leaves* slender and delicate, finely hairy, pale green; their *leaflets* crowded, hardly a quarter of an inch long, linear, rounded at each end, unequal at the base. *Spikes* slender, three or four inches long, hairy, stalked, pale yellow. *Legume* oblong, acute at each end, flat, smooth, with three or four distant flat seeds. "The wood," says Dr. Roxburgh, "is good, and applied to various uses; but the natives have no idea of extracting from it, or any other, the *Catechu*, or *Terra Japonica*. Yet I believe there are many trees as fit to yield this extract, as the present." Mr. Kerr, assistant surgeon to the civil hospital at Bengal, has however described the mode of preparing the *CATECHU*, (see that article,) by boiling the interior coloured part of the wood of this species, till an inspissated extract is obtained, which is the drug in question, long supposed to be an earth produced in Japan. Another sort of *Catechu*, or *Gutta Gambir*, made in Sumatra, Prince of Wales's island, &c., has been shewn by Mr. Hunter, secretary to the Asiatic Society, in Transactions of the Linnean Society, v. 9. 218. to be the produce of a species of *NAUCLEA*. (See that article, spec. 7.) We presume that Mr. Kerr and Mr. Hunter are equally correct, and that the two distinct kinds of *Terra Japonica*, known to druggists, are thus accounted for.

SECT. 6. *Leaves doubly pinnate. Stipulas becoming spines. Spikes globose.* Sixteen species in Willdenow.

A. macracantha. Long-thorned Acacia. Willd. n. 76.—*Spines* stipulary, in pairs, lanceolate, compressed, nearly as long as the leaves, which are doubly pinnate; first division of twelve pair; second of many pair; with a depressed gland at each extremity of the common footstalk. *Spikes* stalked, globose.—Gathered by Humboldt and Bonpland in South America. The *branches* are striated, and nearly round. *Leaflets* about thirty pair in each division, linear, obtuse, fringed. *Footstalks* downy. *Spines* two inches or more in length, sharp-pointed, spreading at a right angle. *Heads of flowers* the size of a pepper-corn, on long stalks, in pairs, either axillary, or disposed in a sort of cluster at the ends of the branches. Willdenow. This species appears very remarkable, on account of the great size of its thorns.

A. eburnea. Ivory-thorned Acacia. Willd. n. 78. (*Mimosa eburnea*; Linn. Suppl. 437. M. leucacantha; Jacq. Hort. Schoenbr. v. 3. 75. t. 393.)—*Spines* stipulary, in pairs, cylindrical-whiplashed, combined at the base, spreading. *Leaves* doubly pinnate; first division of three or four pair; second of six or more pair; leaflets distant, elliptic-oblong. *Heads* axillary, stalked, aggregate.—Sent by Koenig from the East Indies. Jacquin by mistake makes it a native of Africa. He cultivated it at Schoenbrun, but we have not met with this species in any English stove, the following one having been miscalled by the above name. The true *A. eburnea*, of which the original Linnean specimen lies before us, is a twisted irregularly branched shrub, whose twigs are round and zigzag, armed with tremendous straight spines, which are white, smooth and polished, almost like ivory, but brown and very sharp at the end: the longest measure nearly two inches; some are but a quarter that size: they taper gradually from a thick confluent base. *Leaves* about two inches long, with smooth leaflets, placed at the distance of their own width from each other. *Common foot-*
stalk

ACACIA.

stalk with two depressed glands in the upper part. *Flower-stalks* either axillary, or terminal and racemose, more or less aggregate, each bearing a globular *head*, of yellow sweet-scented *flowers*. We know nothing of the *legume*.

A. horrida. Awl-thorned Acacia. Willd. n. 79, excluding the synonym of Jacquin, and perhaps Forikall. (*A. maderaspatana*, folioli parvis, aculeis e regione binis prægrandibus horrida, cortice cinereo; Pluk. Phyt. t. 121. f. 4. *A. eburnea*; Ait. n. 46, but not of Willd. *Mimosa horrida*; Linn. Sp. Pl. 1505. Vahl Symb. v. 1. 81? *M. eburnea*; Roxb. Coromand. v. 2. 54. t. 199.)—Spines stipular, in pairs, linear-awl-shaped, angular, spreading, longer than the leaves; some much shorter and recurved. Leaves doubly pinnate; first division of two or three pair; second of many pair; leaflets crowded, on a hairy stalk. Heads axillary, stalked, aggregate.—Native of the East Indies, flowering in the cold season, sent by Dr. Roxburgh to Sir Joseph Banks in 1792. This is a small ill-looking tree, or large bushy shrub, whose branches spread in every direction, and are round, purplish, wavy, very rigid, armed with formidable thorns, of various sizes. Some of the latter are two inches long, white, spreading horizontally in opposite directions, scarcely combined at the base, much more slender and linear than in the *A. eburnea*, flat or channelled along their upper side; when young they are much smaller, needle-like, and hairy: others, on the same branch, and of the same age, with the large ones, are very short and hooked. The leaves are not half the size of the last species. Heads of flowers globose, with a purplish corolla, and yellow stamens. Legume linear, twisted, two inches long, smooth. The flowers are said by Dr. Roxburgh to be separated from each other, on their globose receptacle, by abrupt, fringed, chaffy scales, of which we can find no traces in our specimens.

A. tortuosa. Poponax Acacia. Willd. n. 82. (*A. americana*, siliquis teretibus ventricosis, floribus luteis; Sloane Jam. v. 2. 56. *Mimosa tortuosa*; Linn. Sp. Pl. 1505. Swartz Obs. 391. Browne Jam. 251. n. 1.)—Spines stipular, in pairs, awl-shaped, much shorter than the leaves, round, downy. Leaves doubly pinnate; first division of three or four pair; second of many pair; leaflets crowded, on a downy stalk. Heads axillary, on downy stalks, solitary or in pairs. Legume externally fleshy.—Very common in the low sandy lands of Jamaica. The stem is shrubby, with spreading wavy branches, rendering the plant useful for hedges according to Dr. Swartz; but Browne speaks of it as of little service, the smell of every part being so rank and disagreeable, that it cannot be used even for fire-wood. The taste is bitter, and the flowers have an oppressive smell. Both these authors mention the legumes as furnished with a glutinous juice under their skin, whose qualities are eminently bitter and astringent. Sloane appears to confound the *A. Farnesiana* and others with this species. The true *tortuosa*, of which we have Browne's own specimen, comes near to *horrida* in botanical characters, but the leaves and leaflets are much larger; thorns smaller, not angular, but more tapering; flower-stalks downy, not smooth. There are no scales on the receptacle between the flowers, but the teeth of the long tubular calyx are very densely and finely fringed. Dr. Swartz says this is the tree really called Poponax in Jamaica, Browne erroneously attributing that name to *A. juliflora*. Both are frequently met with in the same situations.

A. farnesiana. Sponge Acacia. Willd. n. 83. Ait. n. 47. (*A. indica farnesiana*; Aldin. Hort. Farnes. 3. t. 2. 4. *Mimosa farnesiana*; Linn. Sp. Pl. 1506.)—Spines stipular, in pairs, awl-shaped. Leaves doubly pinnate; first division of from five to eight pair; second of many pair; leaflets crowded. Heads stalked, axillary. Legume

tumid; coriaceous.—Native of Hispaniola, from whence the seeds were brought to Italy, early in the 17th century. This shrub is occasionally seen in our stoves, being esteemed for the peculiarly delicious scent of its balls of yellow flowers, which are produced during summer. A coloured figure is much wanted. The dry tumid legume distinguishes it clearly, as a species, from the last. The whole plant is smoother, nor have we ever observed the herbage to be foetid.

A. arabica. East Indian Gum-Arabic Acacia. Willd. n. 86. (*A. altera* var. 8c.; Pluk. Almag. 3. t. 251. f. 1. *Mimosa arabica*; Lamarck Dict. v. 1. 19. Roxb. Coromand. v. 2. 26. t. 149. Nella Tooma of the Telingas.)—Spines stipular, awl-shaped, in pairs. Leaves doubly pinnate; first division of five pair; second of many pair. Heads axillary, about three together. Legume neck-lace-like, flat, densely downy.—Native of the East Indies, whether of Arabia also may be doubted. Dr. Roxburgh says it is abundant over every part of India, thriving best in a low, stiff, uncultivated soil, and flowering most part of the year. Besides yielding a great quantity of Gum Arabic, this tree is one of the most useful in India for its tough and hard wood, serving many valuable purposes in ship-building, wheel-carriages, &c. The astringent bark serves for dyeing, and making ink. The branches are round. Spines distinct, an inch, more or less, in length. Leaves like several of the foregoing, as are also the aggregate globular heads of yellow flowers. But the legumes afford a most striking character, being flat, four or five inches long, covered with dense hoary pubescence, like fine velvet, and remarkably contracted into numerous orbicular portions, in each of which is lodged a flattish seed. Cattle are very fond of the tender branches and young pods.

A. vera. Egyptian Gum-Arabic Acacia. Willd. n. 87. Ait. n. 48. Vesling Ægypt. 6. t. 8. Bauh. Hist. v. 1. p. 2. 429. (*Mimosa nilotica*; Linn. Sp. Pl. 1506. Hasselq. Travels, Engl. ed. 250. Woodv. Med. Bot. 187. t. 67.)—Spines stipular, in pairs, linear-awl-shaped. Leaves doubly pinnate; first division of five or six pair; second of many pair; common stalk glandular. Heads axillary, about three together. Legume neck-lace-like, nearly flat, smooth.—Native of the sandy deserts of upper and lower Egypt, from whence Hasselquist sent specimens to Linnæus, who seems to have described the same plant under the name of *Mimosa Senegal*. This original Gum Arabic tree was known to our earlier botanists, and Gerard appears to have cultivated it in his garden, whence it has obtained a place in Mr. Aiton's valuable work; but few persons at present are acquainted with living, or even dried, specimens, especially of the legumes. These clearly distinguish the species, being more strictly contracted into orbicular portions than the last, with an obliquely well expressed in the wooden cut of Veslingius. Their surface is brown, nearly or quite smooth, pale at the edges; the disk of each lobe rather tumid, from the swelling of the seeds. In the leaves or flowers of these two species, we cannot, from the dried specimens, detect any great difference; but the spines of *A. vera* are almost as remarkable for their length and whiteness as those of *horrida*. For the most valuable produce of this tree, see ARABIC, Gum.

SECT. 7. *Leaves doubly pinnate. Prickles scattered. Eleven species in Willdenow.*

A. cæsia. Grey Acacia. Willd. n. 97. Ait. n. 49. (*A. spinosa*, indix orientalis, foliis subtus cæsis, floribus globosis luteis; Pluk. Mant. 1. Phyt. t. 330. f. 3. *A. zeylanica* farmentosa, flore luteo globoso; Burm. Zeyl. 3. *Mimosa cæsia*; Linn. Sp. Pl. 1507.)—Branches and foot-

stalks

stalks prickly. Leaves doubly pinnate; first division of seven pair; second of sixteen pair; leaflets oblong-oval; a gland on the main footstalk. Spikes globose, in terminal paniced clusters.—Native of the East Indies, from whence it was procured for Kew garden, by sir J. Banks, in 1773, but appears not yet to have flowered. We have seen no authentic specimen of this species.

A. pennata. Fine-leaved Acacia. Willd. n. 98. Ait. n. 50. (*A. aculeata multiflora*, foliis pennas avium referentibus; Burm. Zeyl. 2. t. 1. *A. zeylanica*, flosculis globosis luteis, foliis pinnatis tenuissimis incisis, spinis minoribus; Burm. Zeyl. 3. *Mimosa pennata*; Linn. Sp. Pl. 1507.)—Branches prickly. Leaves doubly pinnate, with many pair of general divisions, and very numerous linear leaflets; a gland on the common stalk. Panicle terminal, spreading; heads stalked, aggregate; general flower-stalks, like the base of the common footstalks, prickly. Legume flat, smooth; wavy at the edges.—Native of Ceylon, and other parts of the East Indies. Sent to Kew, in 1773, by sir J. Banks. We have specimens from Dr. Roxburgh. The very delicate slender leaflets, which, in the dried plant at least, fold together, give a feathery appearance, well expressed in Burmann's plate. The panicle is very large and compound, with downy rusty stalks; its main branches only armed with small hooked prickles. The legumes, not hitherto described, but very important in discriminating this multifarious tribe, are about three inches long, tapering, though rather blunt, at each end, flat, thick-edged, wavy or sinuous at both margins. Seeds about four.

A. Ceratonia. Round-leaved Acacia. Willd. n. 101. Ait. n. 52. (*A. repens aculeata*, flore albo, foliis Siliquis; Plum. Ic. 4. t. 8. *Mimosa Ceratonia*; Linn. Sp. Pl. 1508.)—Branches, and all the stalks, prickly. Leaves doubly pinnate; leaflets three pair, roundish-obovate, oblique, three-ribbed. Panicle terminal. Heads globose. Legume flat, prickly at the edges.—Native of the West Indies, from whence the present duke of Marlborough is said to have introduced it into his rich collection, before the year 1800. The remarkable roundness of the leaflets, which would have authorized the name of *rotundifolia*, and their greater size, distinguish the present species from all we have hitherto noticed. Every part is extremely prickly, but devoid of pubescence. The heads of flowers are rather small, and, according to Plumier, white. He delineates the legume of a flat, oblong, obtuse figure, two or three inches long and one broad, fringed with hooked prickles.

A. tamarindifolia. Tamarind-leaved Acacia. Willd. n. 102. Ait. n. 53. (*A. aculeata*, flore albo, foliis Tamarindis; Plum. Ic. 4. t. 7. *Mimosa tamarindifolia*; Linn. Sp. Pl. 1509. Jacq. Hort. Schoenbr. v. 3. 77. t. 396.)—Branches prickly. Leaves doubly pinnate; first division of five or six pair; second of about fifteen pair; a gland on the common stalk; leaflets oblong. Stipulas and bractæas heart-shaped. Clusters terminal. Heads globose. Legume flat, smooth.—Native of South America and the West Indies. Said to have been cultivated by Kennedy and Lee, at Hammermith, in 1774. The name is very expressive of the aspect of the leaves. The very broad heart-shaped stipulas, and the smaller, more ovate, bractæas, give a peculiar character to this species. Inflorescence rather racemose than paniced, destitute of hairiness or spines, though the branches of the stem are armed with strong prominent prickles. Heads of a few white flowers, each on a long stalk, solitary or in pairs. Legume, according to Plumier's figure, linear-oblong, flat, straight, destitute of prickles at the edges, acute, about three inches long and one broad. Seeds numerous, oval.

A. acantholoba. American Prickly-podded Acacia. Willd. n. 95.—“Branches prickly. Leaves doubly pinnate; first division of three pair; second of ten pair; leaflets linear, obtuse; and downy beneath. Heads globose, nearly sessile, racemose. Legume prickly at the edges.”—Gathered in South America, by the celebrated travellers Humboldt and Bonpland. Branches round. Leaflets ten or eleven pair, clothed beneath with close-pressed hairs. Foot-stalks downy. Prickles scattered, hooked, compressed. Heads small, almost sessile, disposed in a terminal cluster. Legume an inch and a half in length, oblong, flat, membranous, smooth, beset with prickles at the margin. Willdenow. This author declares himself to have been possessed of several specimens of the *Mimosa* tribe, which were too imperfect to be enumerated or defined. We are not only in this situation, but we have several in sufficiently good condition, which on account of the incomplete descriptions of authors, especially concerning the fruit, we cannot ascertain to be described or not.

ACADEMY. The Academy of Arts at Peterburg was established by the empress Elizabeth in 1758, and annexed to the Academy of Sciences. At the suggestion of count Shuvalof, the late empress Catharine, in 1764, formed it, &c. Next col. after l. 54, add,

The academy of painting, sculpture, and architecture, at Vienna, was founded in the year 1705.

Under Academies of Nonconformist Ministers, instead of Manchester r. York, dele Exeter, and instead of Wrexham r. Llanfylling.

ACÆNA, in Botany, *axaxæ*, a thorn, alluding to the prickly fruit. This genus, supposed to consist of only one species, was described by Mutis, who communicated his account of it to Linnaeus, without any specimen, and it was published in Linn. Mant. 2. 145, 200. Some time afterwards Forster founded his *Ancistrum*, Forst. Nov. Gen. t. 2, several species of which have been described by the younger Linnaeus, Lamarck, and other writers. (See ACÆNA and ANCISTRUM.) Vahl first discovered these to be one and the same genus, and has greatly added to the number of species. We shall extract from his work a compendious view of the whole.—Vahl Enum. v. 1. 293. Linn. Mant. 2. 145. Schreb. Gen. 87. Willd. Sp. Pl. v. 1. 693. Mart. Mill. Dict. v. 1. Ait. Hort. Kew. v. 1. 67. Juss. 336. (*Ancistrum*; Forst. Gen. t. 2. Linn. Suppl. 10. Schreb. Gen. 25. Willd. Sp. Pl. v. 1. 154. Mart. Mill. Dict. v. 1. Juss. 336. Lamarck Illustr. t. 22. Gærtn. t. 32.)—Class and order, *Diandria Monogynia*. Nat. Ord. *Sciticeae*, Linn. *Rosaceae*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, turbinate, permanent, with four teeth, each sometimes tipped with an upright bristly awn, barbed at the point, or the whole body of the calyx is so armed. Cor. Petals four, roundish, inserted into the border of the calyx, and shorter than its awns. Stam. Filaments two or four, thread-shaped, longer than the petals, inserted into the border of the calyx; anthers roundish. Pist. Germen superior, oblong; style thread-shaped; stigma many-cleft, tufted. Peric. none, except the permanent calyx. Seed solitary, ovate, coated with the thickened base of the calyx.

Efl. Ch. Calyx of one leaf, armed with barbed bristles. Petals four, inserted into the calyx. Stigma tufted. Seed solitary, coated with the calyx.

Obs. The petals are sometimes wanting. Flowers occasionally five-cleft, with five stamens. The stem is herbaceous, or sometimes shrubby. Leaves alternate, pinnate with an odd one, deeply serrated or cut, often hairy or silky; their common footstalks sheathing, bordered with a pair of membranous

branous combined *stipulas*. Flowers small, greenish, in a globose head, or interrupted spike. Fruit reddish, dry.

1. *A. leppacea*. Bur Acæna. Vahl n. 1. "Fl. Peruv. v. 1. 66. t. 103. f. a."—Leaflets oblong, ferrated. Flowers racemose. Fruit all over prickly. Stem erect."—Native of craggy funny spots in the district of Tarma, Peru. Stems rather shrubby, numerous, a foot high, slightly branched, round, villous. Leaflets four pair, deeply ferrated, hairy; becoming smooth by culture. Flower-stalks axillary, four times as long as the leaves, bearing from five to seven distant, stalked flowers.

2. *A. elongata*. Mutifian Acæna. Linn. Mant. 200. Vahl n. 2. Willd. Sp. Pl. v. 1. 693.—Leaflets oblong, ferrated; downy beneath; bearded at the tips of the ferratures. Spikes elongated, compressed. Fruit all over prickly. Stem nearly erect.—Found in Mexico, by the celebrated Mutis. Stem woody, perennial, with very long, ascending, somewhat compound branches, two feet in length. Leaves feathered; leaflets sessile, crowded; the lower ones very small, linear, acute, entire; from four to eight of the upper pair larger, oblong, ferrated. Spikes axillary, erect, rigid, a span long. Bractæas solitary, close to the calyx, concave, ovate-oblong. Flowers alternate, nearly sessile. Mutis.

3. *A. latebrosa*. Hairy Acæna. Vahl n. 3. Ait. n. 1. (Ancistrum latebrosum; Willd. Sp. Pl. v. 1. 155. A. decumbens; Thunb. Prodr. 6. Agrimonia decumbens; Linn. Suppl. 251.)—Leaflets oblong, cut, hairy. Stem creeping. Spikes elongated, stalked, many-flowered.—Native of the Cape of Good Hope. The germen is downy, beset with many barbed prickles, which, as the fruit ripens, project through the skin of the calyx. See Gärtner f. 2, and Lamarck f. 4.

4. *A. pinnatifida*. Deep-cut Acæna. Vahl n. 4. "Fl. Peruv. v. 1. 68. t. 104. f. b."—Leaflets oblong, deeply ferrated, almost pinnatifid; hairy beneath. Spikes cylindrical. Stem erect.—Found on dry exposed hills in Chili. Commerçon gathered what appears to be the same, at Monte Video, not, as Vahl by mistake says, at the straits of Magellan. The stem is quite simple, a span high, leafy, very hairy in the upper part. Leaves numerous at the root, and several on the stem, with eight or nine pair of leaflets, besides the odd one; the largest near an inch long, copiously and deeply cut, like *Potentilla anserina*. Spike obtuse, an inch or inch and half long, dense, many-flowered, dark purple. Germen beset with strong barbed thorns, not proceeding from its teeth.

5. *A. Sanguisorbæ*. Burnet-leaved Acæna. Vahl n. 5. Ait. n. 2. (Ancistrum Sanguisorbæ; Linn. Suppl. 89. A. diandrum; Forst. Prodr. 10. A. anserinaefolium; Forst. Gen. 2. Lamarck Illustr. v. 1. 76. t. 22. f. 1.)—Leaflets obovate, deeply ferrated; silky beneath. Spikes globose. Stem decumbent. Calyx-teeth awned.—Native of New Zealand, Terra del Fuego, and Staten-land. Introduced into Kew garden by Sir J. Banks, in 1796. Perennial and hardy, flowering in June. The stems are a span or more in length. Leaves resembling Burnet; smooth above. Heads of flowers globose, dense, on long stalks.

6. *A. ovalifolia*. Oval-leaved Acæna. Vahl n. 6. "Fl. Peruv. v. 1. 67. t. 103. f. c." Ait. n. 3. (Ancistrum repens; Venten. Jard. de Cels, t. 6.)—Leaflets elliptic-oblong; villous beneath. Spikes globose. Stem creeping. Calyx-teeth awned. Stigma unilateral.—Native of Peru, in moist shady places. Cultivated at Paris, by the late M. Cels, and at Kew by Mr. Aiton, where it is hardy, flowering in May and June. We can discover no difference

between this and the foregoing, the stigma being perhaps accidentally in perfect.

7. *A. argentea*. Silvery Acæna. Vahl n. 7. Fl. Peruv. v. 1. 67. t. 103. f. b. (Proquin; Feuill. Voy. v. 3. 55. t. 41.)—Leaflets elliptic-lanceolate, acute, ferrated; silky beneath. Spikes globose. Stem creeping.—Native of Chili, in moist ground. The Indians use it as a vulnerary. The branches are two feet long. Leaves shining and smooth above; silvery beneath. Flowers in globular heads, on long stalks. Stamens two or four. Calyx with two, three, or four terminal awns.

8. *A. lucida*. Shining Deep-cut Acæna. Vahl n. 8. Ait. n. 4. (Ancistrum lucidum; Willd. Sp. Pl. v. 1. 155. Lamarck Illustr. v. 1. 77. t. 22. f. 3.)—Leaflets in three or five deep oblong segments; hairy beneath. Spikes oblong. Stem almost buried.—Native of the Falkland islands, from whence Dr. Fothergill procured it in 1777. Commerçon gathered the same in the straits of Magellan. The stems run just under the surface of the ground, sending up numerous leafy tufts. Leaves linear-oblong, of many pairs of small, elliptic-oblong, deeply divided leaflets. Spikes partly interrupted. Fruit reddish, smooth, entirely unarmed, as well as the calyx, in our specimens. Vahl attributes four awns to the latter.

9. *A. trifida*. Three-cleft Acæna. Vahl n. 9. Fl. Peruv. v. 1. 67. t. 104. f. c.—Downy and hoary. Leaflets wedge-shaped, in three or five segments. Spikes globose. Stem erect.—Native of pastures, fields, and hills in Chili. Densely villous. Stems several, unequal, the longest measuring about a foot. Leaflets seven or eight pair; the lowermost often undivided. Flower-stalks terminal, often bearing one or two little round heads, besides the principal one. Bractæas linear. Calyx sometimes five-cleft. Stamens two to five. Fruit obovate, densely villous, with four or five angles, and as many awns. Vahl.

10. *A. magellanica*. Magellanic Acæna. Vahl n. 10. (Ancistrum magellanicum; Lamarck Illustr. v. 1. 76. t. 22. f. 2.)—Leaflets obovate, deeply ferrated, three-cleft; hoary beneath. Spikes globose. Stem erect, smooth.—Gathered by Commerçon, at the straits of Magellan. Stems rather shrubby, three or four inches high, branched, smooth; sometimes hoary at the summit. Leaves at the ends of the branches: leaflets five or six pair, scarcely half the length of the nail; the uppermost with seven or nine teeth, lower with about three, lowest of all entire. Flower-stalks axillary, at the top of each branch, erect, purplish, slightly villous at the upper part. Head twice the size of a pea. Very nearly akin to the last, but the smoothness of the stem, branches clothed with imbricated bases of the foot-stalks, crowded leaves, and smooth bractæas, distinguish this species. Vahl.

11. *A. ascendens*. Ascending Smoothish Acæna. Vahl n. 11. (A. levigata; Ait. n. 5? Ancistrum magellanicum β ; Lamarck Illustr. v. 1. 76.)—Leaflets oblong or obovate, ferrated, nearly smooth. Spikes globose. Stem decumbent.—Gathered by Commerçon at the straits of Magellan. We do not find any specimen from him in the Linnæan collection; but Mr. Menzies has communicated flowers, by the name of *Ancistrum alpinum*, which appear to answer to Vahl's description, except being considerably hairy. These were gathered on the summits of the mountains near Cape Horn, along with *Viola tridentata*. (See VIOLA n. 76.) Vahl speaks of the stems as a span long, smooth. Leaflets from five to seven pair, opposite or alternate, bluntly ferrated, veiny, somewhat hairy at the rib. Flower-stalks terminal, elongated. Head the size of a cherry.

Calyx

Calyx with four awns. The hairiness of the upper side of the leaves in our plant, and the smaller size of the heads of flowers, may be owing to a very lofty or exposed situation. We merely guess this to be Mr. Aiton's *levigata* from the synonym of Lamarck.

12. *A. cylindrichaeba*. Cylindrical-spiked *Acena*. Vahl n. 12. "Fl. Peruv. v. 1. 68. t. 104. f. a."—"Leaflets oblong, serrated; silky beneath. Spikes cylindrical, on nearly radical stalks. Stems subterraneous."—Found on hills in Tarma, Peru. Herb clothed with silky pubescence. Leaves radical, numerous; leaflets ten or eleven pair, obtuse, furrowed. Flower-stalks several, from three to nine inches high, bearing a few simple leaves. *Calyx* purplish, with four awns. *Stamens* two.

13. *A. pumila*. Smooth Dwarf *Acena*. Vahl n. 13.—Leaflets oval, convex, serrated, very smooth; polished on the upper side. Flower-stalks almost radical. Spikes cylindrical.—Gathered by Commerçon at the straits of Magellan, and by Mr. Menzies in Staten-land, near Cape Horn. The root is tuberous. Stems very short, or scarcely any. Leaflets about twelve pair, with blunt revolute teeth; veiny on both sides; paler and opaque beneath. Flower-stalk slightly leafy. Spike interrupted in the lower part. *Germen* beset with very numerous little barbed bristles.

ACALZIKE. After Tartary, add: the capital of *Alizka* (which see); a populous and commercial city, situated in an open valley, on the left bank of the Kur. The inhabitants are, Jews, Turks, Greeks, Armenians, and Georgians.

ACANTHI, in Botany, Jussieu's third natural order of his eighth class, or the thirty-sixth of his general series, named from the most celebrated and conspicuous genus which it contains. For the character of the class, see GENTIANÆ. The *Acanthi* are thus defined.

Calyx divided, permanent, often bracteated. *Corolla* mostly irregular. *Stamina* either two; or four, two of which are shorter than the others. *Style* solitary; with a two-lobed, rarely simple, stigma. *Fruit* capsular, of two cells, often many-seeded, with two elastic valves, and a partition contrary, or opposite, thereto, inserted into their middle, splitting from top to bottom into two uninterrupted receptacles, bearing seeds on each side, rendering the valves semibilocular. *Stem* either herbaceous or shrubby. *Leaves* for the most part opposite, as well as the flowers.

SECT. 1. *Stamens* four, in unequal pairs.

This contains *Acanthus* of all authors; *Dilrovaria* of Jussieu, founded on *Acanthus ilicifolius* of Linnæus; but surely on the slightest possible characters; *Blepharis* of Jussieu; *A. maderaspatesis* of Linnæus, as slightly distinguished; *Thunbergia* of Linn. Suppl.; *Barleria*; and *Ruellia*.

SECT. 2. *Stamens* only two.

Justicia and *Dianthera*.

Mr. Brown, who retains this order by the name of *Acanthaceæ*, Prodr. Nov. Holl. v. 1. 472, has enriched it with many valuable remarks, and some new genera. He combines, like Professor Vahl, *Dianthera* with *Justicia*, but extracts from the latter the *Hypoxistes* of Solander; with *Eranthemum*, originally founded by Linnæus; and establishes moreover two genera of his own by the names of HYGROPHILA and NELSONIA. (See those articles.) We perceive also that this intelligent writer retains Vahl's *Elytraria*. He proposes also *Aphelandra*, consisting of *Justicia pulcherrima* and its allies; *Atheilema*, founded on Forskall's *Ruellia imbricata*, and various undescribed East Indian and African species, of which therefore we can give no account. LEPIDAGATHIS of Willdenow, Sp. Pl. v. 3. 400, of which we

propose to speak hereafter, is admitted by Mr. Brown, as well as a new genus of Jussieu's named *Blechnum*. Some others are less distinctly indicated. We select from the work of our learned friend the following additional observations upon the *Acanthi*, or *Acanthaceæ*.

The anthers are either of two cells, sometimes equal, sometimes unequal in their insertion, or of only one cell; and burst longitudinally. *Germen* furrowed at the base with a glandular disk. *Seeds* roundish, mostly subtended by *retinacula*, proprs, or awl-shaped ascending processes from the partition. *Skin* of the seed lax. *Albumen* invariably none. *Embryo* either curved or straight. *Cotyledons* large, nearly orbicular. *Plumula* inconspicuous. These plants are chiefly tropical. Their pubescence, if any, is simple, occasionally capitate, very rarely starry. *Leaves* opposite, rarely four in a whorl, without stipules, simple, undivided, either entire or serrated; seldom sinuated, or slightly lobed. *Inflorescence* terminal or axillary, spiked or racemose, fasciculated, panicled, or solitary. The order is certainly natural, though not easily to be defined. In some instances the proprs of the seeds are wanting. The rudiments of a fifth stamen frequently occur. The elastic mode of bursting in the capsule is nearly universal.

The following principles by which the genera are to be discriminated, are thus proposed by Mr. Brown in successión, according to their relative importance. 1. Seeds with or without proprs. 2. Partition combined with the valves or separate. 3. Anthers of two cells or of one. 4. Anther-bearing stamens two or four. 5. Limb of the irregular corolla with one lip or two. 6. *Calyx* equal or unequal. Cells of the capsule containing each two or more seeds. The following is the order of Mr. Brown's genera. *Hypoxistes*, *Justicia*, *Eranthemum*, *Ruellia*, *Hygrophila*, *Acanthus* including *Dilrovaria* of Jussieu, and *Nelsonia*, which may be found in their proper places.

ACANTHONOTUS, in Ichthyology, a genus of fish, whose characters are, that the body is elongated, without dorsal fins, and that it has several spines on the back and abdomen. There is one species, a native of the East Indies, described by Bloch under the name of

NASUS; Snouted Acanthonotus, which is grey, with the back transversely barred with brown. This fish is of considerable length, that described by Bloch being two feet and a half; the head is large, the teeth small, forming a row along each jaw, the eyes large, and the nostrils conspicuous; the body, moderately wide for about a third of its length, tapers towards the extremity; head and body are covered with scales, of a bluish tinge, silvery on the abdomen; the pectoral fins brown, of a moderate size, the ventral of like colour, and small; the lateral line straight, nearer to the back than to the abdomen; with ten spines, strong but short, along the narrow part of the back, and towards the abdomen from twelve to thirteen others, followed by the anal fin, which is shallow, and continued into the tail, which is very small. Shaw's Gen. Zool.

ACANTHURUS, a genus of fish, consisting of such species of the Linnæan genus *Chatodon* (which see) as, in contra-distinction to the principal character of that genus, have, in general, moderately broad and strong teeth, rather than slender and setaceous ones; they are also furnished on each side of the tail with a strong spine. Their generic character is as follows: Teeth small, in most species lobated; tail aculeated on each side; habit and general appearance as in the chatodon. The species are,

UNICORNIS. Grey-brown, with a frontal horn stretching

ing forwards over the snout, and two spines on each side of the tail. See *CHÆTODON Unicornis*.

NASTUS. Grey, speckled with black, with a rounded frontal tubercle, and two spines on each side of the tail. A native of the Indian seas, and, according to Cope, first described by Commerçon.

TEUTHIS. Blue, with the middle of the body paler, and a spine on each side of the tail. See *TEUTHIS Hepatus*.

CHIRURGUS; Lancet Acanthurus. Orange-yellow, with the body crossed on the hind part by transverse brown stripes, and a spine on each side of the tail. See *CHÆTODON Chirurgus*.

NIGRICANS. Blackish, sub-argenteous beneath, with a spine on each side of the tail. See *CHÆTODON Nigricans*.

MILITARIS. Brown, with rhombic-ovate body, and strong spine on each side of the tail. Native of the Indian and American seas.

TRIOSTEGUS; Triradiated Acanthurus. Greenish-brown, with four transverse dusky bands, and a spine on each side of the tail. Native of the Indian seas. See *CHÆTODON Triostegus*.

HARPURUS; Guarded Acanthurus; Rhombic-ovate brown Acanthurus, with extremely minute scales, and two spines on each side of the tail. Native of the Indian seas.

SOHAL; Dusky Acanthurus, with longitudinal violet streaks, and two spines on each side of the tail imbedded in a red depression. See *CHÆTODON Sobal*.

NIGRO-FUSCUS; Dusky Acanthurus, with ovate body, and spine on each side of the tail. A variety of the preceding. See *CHÆTODON Nigro-fuscus*.

ACHILLES; Brown, ovate Acanthurus, with a bare ovate red spot on the hind part, aculeated in the middle.

LINEATUS; Ovate-brown Acanthurus, with numerous longitudinal white stripes, and spine on each side of the tail. See *CHÆTODON Lineatus*.

UMBRATUS; Brown-ovate Acanthurus, with extremely minute scales, and a spine on each side of the tail. Native of the Indian seas.

MELEAGRIS; Blackish-brown Acanthurus, thickly marked with round white spots, and spine on each side of the tail. Native of the Indian and American seas.

VELIFER; Broad-finned; whitish Acanthurus, with roundish-ovate body, marked by numerous brown transverse bands, and spine on each side of the tail. Native of the American seas. Shaw's Zool.

ACANTHUS, in *Botany*. In addition to the observations of our predecessor, we would remark, what the writer of the present article has elsewhere hinted, (*Considerations respecting Cambridge, more particularly relating to its Botanical Professorship*, 37,) that every mention of this plant in Virgil accords with the Common Holly, *Ilex Aquifolium*, so far, at least, as the words of the poet indicate any thing in particular. The passages in question are,

- *baccas semper frondentis acanthi.*—Georg. 2. 119.
- *aut flexi tacuisse vimen acanthi.*—Ib. 4. 123.
- Ille comam mollis jam tum tondebat acanthi.*—Ib. 4. 137.
- Et molli circum est ansas amplexus acantho.*—Ecl. 3. 45.
- Mixtaque ridenti coloscasia fundet acantho.*—Ib. 4. 20.
- *circumtextum croceo velamen acantho.*—Æn. 1. 653.
- *pitium croceo velamen acantho.*—Ib. 1. 715.

The flexible twigs, ever-green leaves, bright or gay saffron-coloured berries, (as the term *croceus* is used with considerable latitude by Latin writers,) the head of the plant being clipped by gardeners in the early spring, all sufficiently well apply to the Holly, which is a common wild, as well as garden, shrub, throughout Italy, but of

which we can find no mention whatever in all Virgil's writings, if these passages allude to any thing else. They are acknowledged to be inapplicable to the *ακανθα* of Dioscorides, which is evidently the Linnean *Acanthus*. They are no less so to the *ακανθος* of Theophrastus, which is a tree bearing pods, or legumes. These Greek names, simply meaning a thorny or prickly plant, are variously applied, not only to different trees or shrubs, but to many kinds of thistles. The *Acanthus Dioscoridis*, Linn. Sp. Pl. 891, a species adopted by Linnaeus from other writers, without seeing a specimen or figure, seems to be merely a narrow-leaved, or starved state of *A. spinosus*; of which *A. mollis* may, on the other hand, be a cultivated, or more luxuriant variety. The latter was found by Dr. Sibthorp in Sicily, not in Greece; the former, apparently the natural state of this herb, as described by Dioscorides, occurs in moist stony places, as well as about the borders of fields, in the southern part of Greece, and the islands of the Archipelago, and is very common in Crete.

ACARNA, a name adopted from the Greeks, whose *ακαρνα* was, like this, some sort of thistle. This name is now applied in Willdenow's Sp. Pl. v. 3. 1699, and from thence by Mr. Aiton, Hort. Kew. v. 4. 490, to a genus separated by these writers from the Linnean *ATRACTYLIS* (see that article); from which it differs in the want of a radiis. The species referred to *Acarna* are, 1. *Atractylis gummifera* of Linn. Sp. Pl. 1161; 2. *A. macrocephala*, Desfont. Atlant. v. 2. 253; 3. *A. macrophylla*, ibid. 255. t. 226; 4. *A. cespitosa*, ibid. 254. t. 225; 5. *A. lancea*, Thunb. Jap. 306; 6. *A. ovata*, ibid. 306; and 7. *A. cancellata*, Linn. Sp. Pl. 1162.—We can by no means concur in this alteration. Nothing is less certain than such a generic distinction as the above, when unsupported by any natural character. Willdenow has also separated from *Atractylis* the *purpurata* and *mexicana* of Linnaeus, perhaps with more propriety, their receptacles being nearly naked, and their seed-down simple, to say nothing of a difference in the structure of the radiant florets of the former, which rather invalidates than confirms the new-established genus. See *ONOSERIS*.

- ACCELERANDO,** l. 11, r. refinements.
- ACCENT,** in *Music*, col. 2, l. 7, r. *sfissa*; l. 33, r. winds on your wings, &c.; l. 43, for using r. bowing.
- ACCIACATURA,** l. 13, r. *Prattico*; l. 14, *Cimbolo*; l. 22, r. reprinted.

ACCOMACH, or **ACCOMACK,** l. 3, r. contained in 1810 15,743; l. 4, r. 4542.

ACCOMMODATION, in *Commerce*, a term applied to the acceptance of a bill, when the drawee only lends his name, and the drawer engages to furnish him with the means of payment before the bill becomes due.

ACCOMPANIMENT, col. 4, l. 13, r. *Scuopre*; l. 21, r. leave for have.

ACCOUNT CURRENT, the personal account of a merchant or trader with each of his correspondents or customers, a copy of which account is transmitted to the person whose name it bears, shewing the state of affairs between the parties at the current or present time when made out.

- ACCURSIUS,** r. *Marianus*.
- ACER,** l. 6, r. *Tribilata Acera*. Juff.
- ACERA,** in *Botany*, the sixth natural order, of the 13th class in Juslieu's system; the 66th in his general series. See the characters of this class under the article *GERANIA*. The *Acera* are defined as follows.

Calyx of one leaf. *Petals* definite, very rarely wanting, inserted around the disk, which is under the germen. *Stamina* inserted into the middle of the same disk, definite, but

often unequal in number to the petals. *Germs* simple, standing on the before-mentioned disk; *style* one, or rarely two; *stigma* one or two. *Fruit* of several cells, or several capules, the cells or capules three or two. *Seeds* in each solitary, or at the utmost three, attached to the inner angle, some of them frequently abortive. *Coraculum* destitute of albumen, the radicle lying on the lobes. *Stem* arboreous, or shrubby. *Leaves* opposite, without stipulas. *Flowers* racemose or corymbose; sometimes by the abortion of one or other part becoming separate in sex.

SECT. 1. *Fruit* of several cells, contains only *Aesculus*.

SECT. 2. *Fruit* of several capules, only *Acer*.

SECT. 3. Consists of genera all on the one hand to the *Acera*, on the other to MALPIGHIE; see that article. There are *Hippocatea* and *Thryallis*.

There is some doubt, even in the mind of Jussieu himself, whether *Aesculus* properly belongs to this natural order; and he justly adverts to its great affinity to his SAPINDI, (see that article,) with which its fruit undoubtedly very closely accords.

ACERAS, so named from *α*, without, and *αρα*, a horn, alluding to the want of a nectariferous spur to the lip.—Brown in Ait. Hort. Kew. v. 5. 191. Sm. Compend. Fl. Brit. ed. 2. 128.—Class and order, *Gynandria Diandria*. Nat. Ord. *Orchideae*.

Gen. Ch. *Cal.* Perianth superior, of three ovate, concave, equal, converging leaves. *Cor.* Petals two, linear-lanceolate, concealed by the calyx, and about the same length. Nectary an oblong, flat, pendulous lip, much longer than the petals, with two pair of deep, linear, flat, dependent lobes, but no posterior spur. *Stam.* Filament none; anther erect, oblong, attached by its back, parallel to the style, of two cells, opening in front, the masses of pollen club-shaped, each attaching itself, by a taper base, to two glands in a single pouch near the stigma. *Pist.* Germen inferior, linear-oblong, twisted; style columnar, very short; stigma below the anther, rather concave. *Peric.* Capsule oblong, with three blunt angles, twisted, of one cell and three valves, splitting by three lateral fissures. *Seeds* numerous, minute, each with a chaffy tunic.

Eff. Ch. Calyx converging. Lip without a spur, flat. Anther nearly terminal, fixed to the style, of two cells.

This genus was first established by Mr. Brown, who separates it from OPHRYS, (see that article,) on account of the converging calyx, and especially the situation of the two glands, which receive the pollen, being in one pouch, not in two distinct and distant ones. The latter character, though excellent in this instance, appears to us in others less satisfactory (see GYMNA DENIA, hereafter); and even in the characters of *Aceras* and *Obphrys*, the flat lip of the former, contrasted with the convex one of the latter, seems a more obvious and natural distinction. In affinity the present genus comes nearest to ORCHIS, but wants the spur.

1. *A. anthropophorum*. Green-man *Aceras*. Br. n. 1. Sm. Compend. 130. (Ophrys anthropophora; Linn. Sp. Pl. 1343. Willd. Sp. Pl. v. 4. 63. Sm. Fl. Brit. 937. Engl. Bot. t. 29. Curt. Lond. fasc. 6. t. 66. O. n. 1264; Hall. Hist. v. 2. 133. t. 23. O. anthropophora oreades; Column. Ecphr. 318. t. 320. f. 1. O. flore nudi hominis effigiem representans; Rudd. Elyf. v. 2. 193. f. 6. Vaill. Paris. t. 31. f. 19, 20.)—Lip of the nectary longer than the germen.—Native of dry calcareous pastures, in Italy, France, Switzerland, and England, flowering in June. The root consists of two roundish-ovate, nearly equal, downy bulbs, or knobs. *Herb* smooth, of a bright, slightly glaucous, green, about ten or twelve inches high. *Leaves* several, ovato-lanceolate, all radical, except one which sheaths the lower part of the stalk. *Spice* erect, of

numerous rather scattered flowers. *Calyx* convex, green, with reddish-brown edges. *Petals* green, erect. *Lip* pale yellow, pendulous, near an inch long, in four narrow, rather spreading lobes, of which the two lowermost are usually the shortest; the whole flower having nearly the shape of *Orchis militaris*, except the want of a spur, and of a small central lobe, often observable in that plant. We have found at Valcimara, on the Apennines, what seems a mere variety with a red lip.

2. *A. anthropomorphum*. Short-lipped *Aceras*. (Ophrys anthropomorpha; Willd. Sp. Pl. v. 4. 63.)—Lip but half the length of the germen.—Found on hills in Portugal, by professor Linck. About a span high, the spike an inch long. *Braeas* oblong, membranous, half the length of the germen, nor does the lip exceed that proportion. Willdenow thinks it can scarcely be a variety of the former. We have seen no specimen.

ACERIC ACID, in *Chemistry*, lately discovered by professor Scherer, of Vienna, in the sap of the *acer campestris*, or common maple. Its properties have been very imperfectly described. The acetate of lime is white, slightly translucent, has a weak acidulous taste, and is not altered by exposure to the atmosphere. 1000 parts of cold water dissolve 9 parts, and 1000 parts of boiling water 17 parts of this salt. Schweigger's Journal, iv. Thomson's Chemistry, iv. new edition.

ACETATES, or ACETITES, a class of salts, the characteristics of which are, that they are all very soluble in water; that they are decomposed by the action of heat; and that they afford acetic acid when distilled with sulphuric acid. Accordingly we have acetates of barytes, of potash, of soda, of lime, of ammonia, of magnesia, &c. See ACETIC ACID.

ACETIC ACID. It is now universally admitted by chemists, that the acetic acid differs in no respect from common vinegar, or what was formerly termed *actuous* acid, but in the degree of concentration only. This opinion, first advanced by Adet, has lately been fully confirmed by the experiments of Darracq and Proust. What has been said, therefore, on the subject of *actuous* acid and *vinegar* in the Cyclopaedia, is to be understood as applicable to dilute *acetic* acid; and the salts termed *acetites* are to be considered as *acetates*. The following facts are important, and deserve a place here.

The specific gravity of acetic acid does not enable us to determine its strength. The specific gravity is stated by Dr. Thomson to be a maximum when the liquid is a compound of one atom, and three atoms water. When the proportion of water is either increased or diminished, the specific gravity diminishes. Acid composed of one atom real acid and one atom water, and acid composed of one atom real acid and nine and a half of water, are stated by the same chemist to have the same specific gravity.

The following table, drawn up chiefly from the experiments of Mollerat by Dr. T., exhibits the specific gravity of acetic acid of various strengths.

Atoms.		Weight of		Sp. Gr.
Acid.	Water.	Acid.	Water.	
1	+	1	100	1.0630
		2	100	1.0742
		3	100	1.0770
		4	100	1.0791
		5	100	1.0800
		6	100	1.0763
		7	100	1.0742
		8	100	1.0728
		9	100	1.0658
		10	100	1.0637
		11	100	1.0630

Acetic

Acetic acid of the sp. gr. 1.063 is the strongest that can be procured. It crystallizes at the temperature of 55°, and the crystals melt slowly when heated to 72½°. This had been long ago observed by Courtenvaux. Lowitz has proposed an ingenious method of obtaining it of the requisite degree of strength to crystallize. This consists in making distilled vinegar into a thick paste with well-burnt charcoal, and exposing the mixture to a temperature of 212°. The watery part is driven off, and the acid remains. The acid itself may be separated by a higher degree of heat, and thus obtained in a very concentrated state. It is commonly necessary, however, to repeat the process before it can be made to crystallize.

Mr. Chenevix, by distilling the acetates, obtained a peculiar substance different from acetic acid, and which he has denominated *pyro-acetic spirit*. The acetates of potash and soda gave a greater proportion of this principle than any of the metalline acetates; but when the acetate of barytes is distilled, the whole liquid product consists of this spirit without any mixture of acid whatever. No other genus of salts tried, such as the oxalates, tartrates, or citrates, yielded this spirit, nor was acetic acid converted into it by heat.

Pyro-acetic spirit is a white and limpid fluid. Its taste is at first hot and acrid, but it becomes cooling and rather urinous. Its smell is peculiar, and is compared by Mr. Chenevix to that of a mixture of oil of peppermint and bitter almonds. Its specific gravity is .7864. It burns with a flame, white exteriorly, but of a fine blue within, and leaves no residue. It boils at a temperature of 165°. It mixes with water, alcohol, and volatile oils, in any proportion. With hot olive-oil it also mixes in any proportion; but with that oil cold it only mixes in certain proportions. When hot it dissolves wax and tallow. It dissolves also a little sulphur and phosphorus, and is an excellent solvent of camphor. It dissolves potash, and becomes dark-coloured, but it may be obtained again unaltered by distillation. Strong sulphuric acid blackens and decomposes it. Nitric acid renders it yellow, and changes its properties. Muriatic acid renders it brown. When distilled with this acid a combination takes place, and a substance is formed possessing very different properties from muriatic ether. These properties are sufficient to shew, that the pyro-acetic spirit is a distinct substance, and differs entirely from alcohol, ether, and volatile oils. Of course, therefore, as Dr. Thomson observes, it deserves a distinct place among compound combustibles.

Many attempts have been made to analyse the acetic acid. Those most worthy of notice are by Gay Lussac and Thenard, and Berzelius. The former burnt a mixture of acetate of barytes and chlorate of potash. The results were carbonic acid and water. Berzelius's analysis was made on the same principles, but the salt he employed was supposed to be quite free from water. The following are the results of these celebrated chemists:

	Hydrogen.	Carbon.	Oxygen.	Acid.
Gay Lussac	5.629	+ 50.224	+ 44.147	= 100
Berzelius	6.55	+ 46.83	+ 46.82	= 100

If, with Dr. Thomson, we consider the results of Berzelius most entitled to credit, acetic acid consists of

3 atoms or proportions of hydrogen,	weighing	0.375
4 ————— of carbon	—————	3.000
4 ————— of oxygen	—————	3.000

Or of ten atoms or proportions, and the weight of an integrant particle, will be 6.375; and this weight, as the same

chemist has shewn, accords very well with the constitution of the acetates.

ACHARIA, in *Botany*, a genus dedicated by Professor Thunberg, to the honour of his countryman Dr. Eric Acharius, knight of the order of Wasa, a member of various learned societies, and one of the most distinguished botanists of the present day, particularly with regard to the *Lichen* tribe, which he has profoundly studied, and most learnedly illustrated. (See **LICHENES**.) Dr. Acharius is now Regius Professor of Physic, at Vadstena, in Sweden.—Thunb. Prodr. præf. n. 7. Willd. Sp. Pl. v. 4. 327. Lamarck Illustr. t. 755.—Class and order, *Monoclea Triandria*; or rather, perhaps, *Triandria Monogynia*. Nat. Ord. *Eleagni*, Juss.?

Gen. Ch. *Cal.* Perianth inferior, of two small, ovate, acute, permanent leaves. *Cor.* of one petal, tubular-bell-shaped, downy, in three deep, equal, elliptical segments, permanent. *Stam.* Filaments three, very short, inserted into the top of the tube of the corolla, opposite to its segments; anthers roundish, of two lobes. *Pist.* Germen superior, roundish; style solitary, thread-shaped, half as long as the corolla; stigma three-cleft. *Peric.* Capsule ovate, of one cell, and three valves. *Seed* solitary? globose, rough. The *filamens* are most perfect in the upper flowers, the *pistil* in the lower.

Eff. Ch. Calyx of two leaves. Corolla of one petal, three-cleft. Capsule of one cell, and three valves. Seed solitary?

Obs. Nothing can be more imperfect or puzzling than the character and natural affinity of this genus, according to the materials furnished by Thunberg, especially what regards the *capsule* and *seed*. He defines the fruit, "*capsule* of one cell, with three *seeds*." Willdenow, who seems to have had no other authority than Thunberg's figure, says, "*capsule* of one cell and three valves, with a solitary *seed*," which last account best agrees with that figure. With respect to the natural order of *Acharia*, if we take for *bractes* what Thunberg terms a *calyx*, the *flower* will indicate one of Jussieu's *Eleagni*, though the *capsule* of three valves is very anomalous, and the lobed *leaves* no less so. By the specific name *tragodes*, or rather *tragioides*, and the place where the genus is introduced, Thunberg appears to have considered it as akin to **TRAGIA**, (see that article,) which idea the aspect of the *leaves*, and the somewhat monoecious *flowers*, might probably suggest.

1. *A. tragodes*. Lobed Acharia. Thunb. Prodr. 14. t. 1. Fl. Cap. v. 1. 160. Willd. n. 1.—Gathered by Professor Thunberg, near Van Stade's river, and in other parts of the interior of Africa, above the Cape of Good Hope, flowering in December and January. *Root* fibrous, annual? *Stem* solitary, herbaceous, erect? from four to twelve inches high, branched from the bottom to the top, smooth; *branches* alternate, angular, erect, somewhat zigzag, wand-like, subdivided. *Leaves* alternate, on stalks about their own length, about an inch long, three-lobed, finely downy; lobes obovate, variously cut. *Flowers* in effect monoecious, axillary, solitary, on short stalks, reflexed, small, the male about the upper part of the plant, female lower down. The *corolla* is about a quarter of an inch long, downy all over, as are likewise the *germen* and *style*. *Capsule* ovate-oblong, acute, thrice the length of the permanent corolla. *Seed* nearly the size of a pepper-corn, apparently black and rough.

ACHERON, l. 1, r. Theoprotia.

ACHILLINI, l. 25, for 40 r. 49.

ACHIMENES, in *Botany*, so named by Browne, possibly

sibly from *a*, and *αἰμαῖνα*, to be country, or temperate, meaning that the plants in question are not calculated to endure rough weather. He tells us they thrive best in the cooler parts of Jamaica. When cultivated in Europe, they require great heat. This genus is founded on two species only, and those as generically different as two plants of the same natural order can well be. See Browne's Jamaica, 270. t. 30. f. 1, and Juss. Gen. 119. The latter writer, following Browne, did not distinguish these plants. One of them is *Columna kirilata*, the other our CYRILLA; see that article.

ACHOR, last line. *r.* PORRICO instead of TINEA

Capit.

ACHROCORDES. Add. See SERPENTES.

ACHTIL, ACHELIEG, or *Martel*, a coin-measure in Germany, which contains 4 himmers, 8 metzers, 16 fecters, or 64 gefcheides. See MALTER.

ACIANTHUS, in *Botany*, from *αἶσ*, a point, and *ανθος*, a flower, because of the bristly tips of the calyx-leaves, unusual in this family.—Brown Prodr. Nov. Holl. v. 1. 321.—Clas and order, *Cynandria Monandria*. Nat. Ord. *Orchidææ*.

Gen. Ch. *Cal.* Perianth three-leaved, somewhat ringent, awned; its two side-leaves placed under the lip; upper one broadest, vaulted, erect. *Cor.* Petals two, linear-lanceolate, much smaller than the calyx. Nectary a prominent undivided lip, shorter than the petals, with two swellings at the base, but no appendage to the disk. *Stam.* Anther terminal, permanent, of two cells close to each other; masses of pollen in each cell four, or two divided ones. *Pist.* Germen inferior, oblong, angular; style erect, semi-cylindrical, without any auricles or wings at the summit; stigma in front. *Peric.* Capsule of one cell. *Seeds* numerous, minute.

Eff. Ch. Calyx somewhat ringent; its side-leaves under the lip. Lip without a spur, shorter than the petals, undivided, with two prominences at the base. Anther terminal, without appendages, permanent. Pollen powdery. Column semi-cylindrical.

This genus is next akin to MICROTIS of the same author (see that article); to whose essential character should be added, "Anther with two auricles. Column funnel-shaped."—*Acianthus* consists of little smooth herbs, with solitary, undivided, naked, downy bulbs, or tubers, throwing out a few fibres, along with a downy shoot, at whose extremity the young bulb is situated, on a partial stalk. *Stem* very short, its base enclosed in a short, tubular, pointed sheath. *Leaf* solitary, deeply heart-shaped, acute, with three ribs, and many reticulated veins; its under side red or purple. *Flowers* small, reddish, either clustered or solitary, their common stalk without bractæ, except beneath each flower.

1. *A. fornicatus*. Vaulted Acianthus. Br. n. 1.—Flowers racemose. Awns four times shorter than the perianth. Petals nearly erect. Lip bearing longitudinal glands. Column concealed.—Native of the neighbourhood of Port Jackson, New South Wales, from whence we, long ago, received specimens in spirits, as well as dried, by favour of Dr. White, and where Mr. Brown has also gathered this curious little plant. The leaf is about an inch in diameter. Common flower-stalk from three to six inches high, bearing from two to six flowers, about the size and aspect of the *Coralorrhiza*, each with an ovate bractæ at its base. Lower leaves of the calyx linear-lanceolate, very narrow in comparison of the upper one. Petals linear-lanceolate, very delicate. Lip somewhat fleshy, having a longitudinal furrow, the ridges bearded horizontally

with papillary glands. This is the only species we have seen.

2. *A. exsertus*. Prominent Acianthus. Br. n. 2.—Flowers racemose. Awns very short. Upper calyx-leaf tapering at the base. Petals horizontally reflexed. Lip glandular at the extremity. Column prominent.—Gathered by Mr. Brown, near Port Jackson.

3. *A. caudatus*. Long-awned Acianthus. Br. n. 3.—Stalk with one or two flowers. Awns very long. Leaf way at the margin.—Gathered by Mr. Ferdinand Bauer, in the neighbourhood of Port Jackson.

4. *A. bifidus*. Two-leaved doubtful Acianthus. Br. n. 4. (*Epipactis reflexa*; Labill. Nov. Holl. v. 2. 60. t. 211. f. 1.)—"Stalk single-flowered. Leaves two, radical, hooded. Perianth without awns, its three leaves uniform; the lateral ones reflexed. Petals? linear, narrow."—Gathered by Labillardiere, at Cape Van Diemen. Mr. Brown doubts whether this species, which he appears not to have examined, is most akin to *Acianthus*, or to another genus of his, hereafter to be noticed, named *Chiloglottis*. It agrees with the former in having four masses of pollen, a column destitute of a joint, and a lip without any appendage: with the latter in bearing two radical leaves, a perianth without awns, and very narrow petals. These last are represented in the plate, at fig. 2, as if situated on the outside of the calyx, which the description, and, if we mistake not, the other figures, shew to be an error of the draughtsman or engraver.

ACICARPHA, so named by the celebrated Jussieu, from *αἶσ*, a point, and *καρπῆ*, a chaffy scale, because the scales of the receptacle, as he thought, become armed with a spinous point, when the seeds, which they separately envelop, approach towards maturity.—Juss. in *Annal. du Mus. d'Hist. Nat.* v. 2. 347. Willd. Sp. Pl. v. 3. 2327.—Clas and order, *Syngenesia Polygamia-necessaria*? Nat. Ord. *Compositæ capitatæ*, or rather *Aggregate*, Linn. *Corymbifera*, Jelsk. 5. Juss.

Gen. Ch. *Common Calyx* of one leaf, in five deep, linear, spreading segments, permanent. *Cor.* compound, discoid. Florets all uniform, tubular, funnel-shaped; their limbs somewhat bell-shaped, five-cleft, obtuse; the central ones male, leaf numerous; those of the circumference more abundant, each furnished with stamens and pistil, but not all fertile. *Stam.* Filaments five, very short; anthers oblong, united, shorter than the limb of the floret. *Pist.* Germen oblong; style thread-shaped, longer than the corolla; stigma club-shaped, notched. *Peric.* none, except the hardened scales of the receptacle. *Seeds* solitary; oblong, destitute of crown or wing, each enclosed in a greatly enlarged, hardened, concave, spinous-pointed scale of the lower part of the cylindrical chaffy receptacle.

Eff. Ch. Receptacle chaffy. Seed-down none. Calyx in five deep segments. Florets uniform, tubular. Seeds separately enclosed in the spinous scales of the receptacle.

1. *A. tribuloides*. Caltrop Acicarpa. Juss. as above, 348. t. 58. f. 1. Willd. n. 1.—Leaves oblong, deeply toothed.—Gathered by Commerçon, on the sea-shore at Monte Video. *Root* tapering, annual. *Stems* one or more, herbaceous, ascending or decumbent, a span long, somewhat branched, leafy, smooth. *Leaves* alternate, sessile, oblong, obtuse, fleshy, smooth, an inch and a half to three inches long, deeply and coarsely toothed; tapering at the base. *Flower-stalks* terminal and lateral, opposite to the leaves, and about as long, simple, single-flowered, erect. *Flowers* white, hemispherical, one-third of an inch in diameter. *Fruit* a globular head, armed with unequal, rigid, sharp, pale, divaricated, or recurved spines, and crowned with

with a tuft of withered male florets, like a tassel: The intermediate florets seem to be abortive, though furnished with the most conspicuous pistils.

2. *A. spatulata*. Spatulata Acicarpha. Brown Tr. of Linn. Soc. v. 12. 129.—Leaves spatulate, mostly entire.—Sent from Brazil by Mr. Sellow. A smooth, diffuse, apparently annual plant, with angular ascending branches. Leaves scattered, stalked, without stipules, spatulate, with a very short little point, rather thick, and perhaps glaucous, an inch and a half long; the lower ones sometimes toothed from above the middle. Footstalks linear, a little dilated at the base; the lowermost longest. Heads of flowers yellow, solitary; either stalked and opposite to the leaves, or terminal and nearly sessile. Involucrum of five leaves in a simple row, longer than the flowers. Receptacle conical, slender, chaffy, with lanceolate pointed scales. Florets tubular, uniform, smooth. Those of the circumference in two or three rows, with perfect stamens as well as pistils. Tube of the corolla slender, cylindrical, closely united to the germens and base of the style; limb funnel-shaped, five-cleft, segments parallel at the edges, half-lanceolate, flat, three-ribbed. Stamens five, inserted into the corolla, alternate with its segments, their filaments, as well as the lower half of the anthers, united into a tube. Germens combined, each crowned with a five-cleft partial calyx, whose teeth, alternate with the segments of the corolla, become spinous, each germen containing one pendulous seed. Style thread-shaped, smooth. Stigma simple, obtuse, rather hairy. The numerous upper florets are rather smaller, with a membranous calyx, and imperfect germens. The ripe fruit, originating from the florets of the circumference, consists of close pericarps, combined together, not bursting, each crowned with its own enlarged spinous calyx. Seed ovate, pendulous. Albumen fleshy, large, white. Embryo nearly cylindrical, central, about the length of the albumen, with two linear cotyledons. By this account it appears that Mr. Brown differs from M. de Jussieu, in thinking the present genus belongs to the Linnæan order of *Aggregate*, and not to the *Compositæ*. This last account of the fruit is evidently more natural than the above, and the character, if Mr. Brown, which we doubt not, be correct, must be altered to “Seeds crowned with the spinous partial calyx.”

ACID, ACIDIFICATION, in *Chemistry*. When these articles were written for the Cyclopædia, the theory of Lavoisier, that oxygen was the only principle of acidification, was almost universally received. Since that period, however, a great revolution has taken place in chemistry, and the doctrine in question is now no longer admitted. This indeed has been noticed in subsequent parts of this work, more especially under OXYGEN and OXYMURIATIC ACID; so that little more is necessary than to refer our readers to these articles. It may not be deemed superfluous, however, to mention here very briefly the discoveries that have led to these important changes.

The first circumstance which gave the death-blow to the doctrine of Lavoisier, was the demonstration by Gay Lussac and Thenard, and more especially by Davy, that oxy muriatic acid, or chlorine, as it is now termed, contains no oxygen, but is a simple elementary substance. Chemists indeed had never been able to demonstrate satisfactorily that oxygen actually existed in this substance; but misled by the plausibility of the Lavoisierian doctrines, had tacitly admitted its presence from analogy: and so strongly was this belief founded, that there are a few, we believe, who adhere to the old opinions even to the present time.

More recently, however, the old opinions have been rendered still further improbable, and the new ones corroborated

by the discovery of iodine and cyanogen; the one an elementary, the other a compound substance, both which have been unequivocally demonstrated to form acids by combining with hydrogen. The analogy, also, of sulphuretted and telluretted hydrogen, compounds free from oxygen, but possessing the properties of acids, have been likewise urged in proof of the new opinions, and as quite irreconcilable with those of Lavoisier.

Our readers will find further information on this subject in the articles CHLORINE, CYANOGEN, IODINE, MURIATIC ACID, OXYGEN, and OXYMURIATIC ACID.

ACINACIFORME, FOLIUM, in *Botany*, a Scimitar-shaped Leaf, is scarcely used but for one species of *Mesem bryanthemum*, which bears this specific name. (See LEAF. It is of a succulent texture, compressed, one edge convex and thin, the other straighter and thick.

ACINACIFORME, *Pericarpium*, a Seed-vessel of a similar shape, is exemplified in the cells of the capsule of the same genus of *Mesembryanthemum*; see Linn. Phil. Bot. 224.

ACINUS, in *Botany and Vegetable Physiology*, a Grain, is technically used for each pulpy portion, containing a solitary seed, of a compound Berry. (See BACCA.) The fruit of the Raspberry, Bramble, &c., consists of several acini; and perhaps the same term may be applied to the separate portions of a Mulberry, though originating in the calyx of each flower become pulpy. In *Passiflora* the capsule is lined with very juicy acini, each lodging a single seed. Gærtner improperly extends the above term to the simple many-seeded berries of the Vine, Gooseberry, &c. The last-mentioned fruit, in an early state, rather resembles the *Passiflora*.

ACONITUM, in *Botany*, (see our former article,) has received considerable elucidation from professor De Candolle, in his *Regni Vegetabilis Systema Naturale*, v. 1. 364, where this genus is treated of as one of the natural order of RANUNCULACEÆ. (See that article.) Its generic references are, Linn. Gen. 274. Schreb. 368. Willd. Sp. Pl. v. 2. 1232. Mart. Mill. Dict. v. 1. Ait. Hort. Kew. v. 3. 321. Sm. Prodr. Fl. Græc. Sibth. v. 1. 372. Pursh 372. Juss. 234. Tourn. t. 239, 240. Lamarck Illustr. t. 482. Gærtner. t. 65. “Koelle Monogr. 1788. Erlang. in 8vo.”—Class and order, *Polyandria Pentagynia*. Nat. Ord. *Multifloræ*, Linn. *Ranunculaceæ*, Juss. De Cand.

Eff. Ch. Calyx none. Petals five; the uppermost vaulted. Nectaries two, stalked, recurved. Capsules three or five.

M. De Candolle, following Jussieu's view of the subject, gives the following characters, using the term *sepala* for calyx-leaves, and *petala* for nectaries.

Calyx of five petal-like, deciduous leaves; the upper one (hood) large, concave, helmet-shaped; two lateral ones, (wings) orbicular; two lowermost oblong. Petals five, sometimes irregular in number; three very minute, claw-shaped, often converted into stamens; two uppermost with long claws, hooded, sheltered under the helmet-shaped leaf of the calyx, dilated at the top into a bag, whose bottom, the summit, or spur, of the petal, is callous, incurved, its mouth extended into an oblong, emarginate limb, or lip. Stamens indefinite. Capsules three to five, with an indefinite number of seeds.

Perennial herbs, with tuberous roots, whose knobs in some instances bear fibres, in others are oblong, and mixed therewith. Stem leafy. Leaves stalked, deeply palmate, with from three to five segments, variously cut, cloven and toothed. Clusters terminal. Stalks single-flowered, from the bottoms of the bracts, each bearing two smaller bractlets.

Flowers

ACONITUM.

Flowers large, irregular, sometimes sulphur-coloured, sometimes blue, or white.

All the species are poisonous; the *Anthora* less dangerous; the *Napelli* highly noxious. The root is always the most poisonous part, the herbage less acrid, and though in a fresh state injurious to animals, by drying, or by boiling in water, it becomes so mild, that some species, *A. septentrionale* for instance, are eatable! Dr. Storck, who found Aconite to be useful in chronic rheumatism, confirmed gout, and venereal swellings of long duration, employed *A. paniculatum*; but other physicians have often, without sufficient attention, promiscuously given every kind with blue flowers.

The twenty-eight species at this time known inhabit rough bushy or woody places, in the northern hemisphere; eleven are found in Europe, eleven in Siberia, one in Japan, one in North America, and one is common to Siberia and the western part of North America.

This is a most natural genus, but very difficult as to the determination of its species, nor has it been properly investigated. Clusius in his time was extremely well acquainted with the European kinds, and requires to be consulted in preference to all other writers.

Aconitum may be distributed by the habit, rather than by any characters, into five sections, or divisions, as follows.

SECT. 1. *Anthora*. Flowers pale yellow. Hood convex. Leaves in numerous deep linear segments. Species 1 and 2.

2. *Lycostomum*. Flowers pale yellow, or very rarely blue. Hood conical, elongated, scarcely pointed in front. Leaves in wedge-shaped lobes. Species 3—10.

3. *Napellus*. Flowers blue or white. Hood convex. Leaves in numerous deep linear segments. Species 11—14.

4. *Cammarum*. Flowers blue or white. Hood conical, or very convex, with a long point in front. Leaves with wedge-shaped lobes. Species 15—20.

5. *Anabates*. Flowers blue or white. Hood convex. Stem climbing, somewhat twining. Species 21—25.

† Such as are not sufficiently described; 26—28.

†† Such as are doubtful, or uncertain; 29—35.

SECT. 1. *Anthora*.

To the above characters are added—Hood acute at the apex. Root with two oblong knobs.

1. *A. Anthora*. Whole some Wolf's-bane. (No. 5 of our former article.) Linn. Sp. Pl. 751. Willd. n. 5. Ait. n. 4. Jacq. Auftr. t. 382. (Anthora Matth. Valgr. v. 2. 441. Camer. Epit. 837. Rivin. Pentap. Irr. t. 12 S. A. vulgaris. Clus. Hist. v. 2. 98. A. five Aconitum salutariferum; Ger. Em. 969. A. vera, flore luteo; Barrel. Ic. t. 609.)

β. atrovensis; leaves and stalks smooth. (A. salutariferum elatius pyrenaicum, foliis atro-virentibus, flore majore; Tournef. Inf. 425.)

γ. confertiflorum; cluster cylindrical, dense, downy. (A. tuberosum; Patrin, unpublished.)

Hood convex, terminating in a point; spurs spiral; lips inversely heart-shaped. Leaves in numerous linear segments.—Native of rough bushy places, on the mountains of Europe; in Switzerland, on the Apennines, and in Siberia; β on the Pyrenees; γ on mount Caucasus.

Var. α has either a simple or branched stem, which, like the flower-stalks, is either smooth, or finely downy. β has smooth dark-green leaves, a taller and smooth stem, less convex hood, with a more abrupt and pointed beak. γ is smaller, with a closer more cylindrical cluster, whose main stalk, as well as the partial ones, are clothed with velvet-like down; it may be a distinct species. De Candolle.

We have not followed, here or elsewhere, our learned friend, in his elaborate assemblage of synonyms, nor in his

chronological arrangement of them. To the latter we have objections, and the former would only be burthenome to our plan. We wish to give our readers an idea of his powers of discrimination, and to profit by them ourselves.

2. *A. anthoroideum*. Prominent, Whole some Wolf's-bane. (A. pyrenaicum; Pallas Itin. v. 2. 316, by his herbarium.)

—Hood convex; its back protruding forward, over the pointed beak; spurs spiral; lips inversely heart-shaped. Leaves in numerous linear segments.—Gathered by Pallas in Siberia. This is so like *A. Anthora*, that perhaps it may be esteemed a mere variety. It differs only in this respect, that the back, or ridge, of the hood is not merely convex, but stretched forward over the point in front. This plant varies like the former as to the density of its cluster, and the smoothness or fine downiness of the flower-stalks. De Candolle. We most readily concur in the opinion of its being a variety of the first species.

SECT. 2. *Lycostomum*.

Flowers pale yellow, whitish, or bluish; their hood conical, elongated, obtuse, scarcely pointed in front. Root tuberous, sending out fibres. Leaves with somewhat wedge-shaped lobes, deeply toothed, or jagged, at the extremity.

3. *A. barbatum*. Bearded Wolf's-bane. Patrin, unpublished. "Perf. Enchir. v. 2. 83. Poiret Suppl. to Lamarck Dict. v. 1. 114."

—Hood conical, obtuse; spurs straight; lips obovate; wings bearded with a fringe. Bractees minute. Stem downy. Leaves in five deep divisions, with linear pointed lobes.—Native of the eastern part of Siberia, about Irkoulsk. Patrin. Intermediate between *Anthora* and *Lycostomum*, differing from the former in having a conical hood, from the latter in the linear lobes of its leaves; from both in the straight spurs, or summits of the nectaries, (De Candolle's petals). Stem round, finely downy, not hispid. Leaves with long scattered hairs on the footstalks, and here and there on the under side; the upper appearing downy when magnified; their outline circular, divided nearly to the base into five somewhat cohering lobes, pinnatifid, with linear pointed segments. Cluster erect, long and dense. Stalks erect, downy, shorter than the flowers, having under each a linear-awl-shaped, scarcely downy; bractea, still shorter; as well as a smaller close bractea half way up. Flowers whitish, according to Patrin; pale yellow when dry; externally downy; hood elongated; wings orbicular, with long hairs on their margin and inner surface. Germens downy.

4. *A. bipidum*. Rough-stalked Wolf's-bane. De Cand. n. 4.—Hood conical, obtuse; spurs straight; lips obovate; wings slightly bearded. Bractees awl-shaped, hairy. Stem hairy.

Leaves in five deep divisions, with linear, rather acute, lobes.—Found by Pallas, in the eastern part of Siberia. Lambert. Differs from the last in its hispid, not downy, stem; more deeply five-cleft leaves, whose lobes are not pointed, but rather obtuse, with a little callous apex; more hairy bractees; and scarcely bearded wings. The leaves are very like *Anthora*, but with broader lobes; flowers like *Lycostomum*, but with straight spurs. Stem erect, round, simple; hispid chiefly at the base, with soft, rather deflexed, hairs; the top almost smooth. Lower leaves on long hairy stalks, their outline orbicular; upper side scarcely downy; ribs of the under one hairy. Cluster simple, rarely with one small branch, cylindrical, erect. Stalks erect; shorter than the flowers, which are pale yellow, resembling the last, but less bearded. Bractees awl-shaped, shaggy, two lines long; two smaller ones in the middle of each stalk. De Candolle.

5. *A. squarrosum*. Spreading-lobed Wolf's-bane. Linn. MSS. in Herb. propr. De Cand. n. 5. (A. n. 2; Linn. Hort. Ups. 152, excluding the synonyms. A. pyrenicum; Linn. Sp. Pl. 751, excluding the synonyms, and the Pyrenees

ACONITUM.

as its place of growth.)—Hood conical, obtuse; spurs spiral; lips inversely heart-shaped. Cluster drooping at the summit before expansion. Leaves in five deep divisions; lobes pinnatifid, with spreading, recurved, acute segments.—Native of Siberia and Tartary; cultivated in the Upsal garden. Very nearly allied to *Lycotoxicon*, but differing in the leaves being divided to the very base into many pinnatifid portions, whose elongated, acute, widely spreading segments are entire, not at all cut or serrated. *Cluster* long, its upper part drooping while the flowers remain in bud. *Bractææ*, both general and partial, very small. *Stalks* shorter than the flowers, but much longer than their respective *bractææ*. The rest as in *Lycotoxicon*. *De Cand.* To this original specimen is attached a different one from Siberia, which we concur with professor De Candolle in thinking no other than *Lycotoxicon*. Hence Linnæus is no authority for *A. pyrenaicum*, which depends upon other authors, as follows. His herbarium indeed contains, if we mistake not, a specimen of this species, brought by baron Althroemer from Spain, but so confounded by Linnæus with *Lycotoxicon*.

6. *A. pyrenaicum*. Pyrenean Wolf's-bane. Lamarck Dict. v. 1. 33. Desfont. Tabl. 149. "De Cand. Franc. ed. 3. v. 4. 916. v. 5. 642." (*A. pyrenaicum*, *ampliore folio tenuius laciniato*; Tourn. Init. 424. A. n. 6; Camer. Epit. 831, with a figure.)—Hood conical, obtuse; spurs spiral; lips obovate. Leaves palmate below the middle, with from seven to nine three-cleft, deeply cut lobes, lying over each other.—Native of rugged meadows on the Pyrenees, among lofty thickets, flowering in July and August. Tournefort and De Candolle. Related to *Lycotoxicon*, but certainly distinct. A handsome plant, three or four feet high, downy, with large, long-stalked, almost circular leaves, whose main lobes are unequally divided, wedge-shaped at the base, separated upwards into acute, cut lobes, dilated so as frequently to overlap each other. *Cluster* long, cylindrical, dense, more or less branched at the base. *Stalks* often shorter than the flowers. *Lower bractææ* in three or five lobes; *upper* linear, in the middle of each stalk, spreading, from two to five lines long. *Flowers* pale yellow, externally covered with velvet-like down. *Germens* hairy. These characters are not very strong, but they are constant. Specimens gathered by De Candolle in the Pyrenees differed in no respect from those which have been cultivated at Paris, ever since the time of Tournefort. *De Candolle*. We have had no opportunity of enquiring what stands for this species in the gardens of England, but Miller is most likely to have received the true plant from France. Our Linnæan Spanish specimen, mentioned under the last, correctly answers, in every point, to the above description.

7. *A. lycotoxicon*. Great Yellow Wolf's-bane. Linn. Sp. Pl. 750. Willd. n. 1. Ait. n. 1. Jacq. Austr. t. 380. Bulliard Fr. t. 63. Villars Dauph. v. 3. 703, from the author. (*A. lycotoxicon* vulgare, luteo flore; Cluf. Hist. v. 2. 94. *A. luteum ponticum*; Loh. Ic. 677. Ger. Em. 970. *A. reticulata radice*, flore sulphureo-albicante; Barrel. Ic. t. 599, 600. A. n. 2; Camer. Epit. 827. Matth. Valgr. v. 2. 431. *Napellus* flore luteo; Rivin. Pentap. Irr. t. 129.)—Hood conical, obtuse; spurs spiral; lips obovate. Leaves downy, divided more than half way, into from three to five lobes, which are three-cleft and jagged. Partial bractææ in the middle of each flower-stalk.—Native of woods, thickets, and grassy pastures, on the mountains of Switzerland, France, Germany, and Italy, flowering in summer. This is probably, as M. De Candolle indicates, the real *ακονίτιον λυκοτόξικον* of Dioscorides, with whose imperfect account it sufficiently agrees. It is one of the most common of this genus, but not found in Britain. The stem

is from two to four feet high, nearly simple, or very much branched, smooth or downy. Lobes of the leaves more or less deep, either close or spreading. *Flowers* crowded or distant. M. De Candolle hints that some of these diversities may afford specific distinctions, but we can scarcely suppose this. He observes that *A. lycotoxicon* differs from *barbatum*, *hispidum*, and *ochroleucum* in its spiral spurs; from *pyrenaicum* in having from three to five, not seven to nine lobes in the leaves, and those not lying over each other, as well as in the germens being smooth, scarcely at all downy or hairy, and the stalks mostly longer than their flowers. From the following one, hitherto confounded herewith, it differs in having pale-yellow, not blue, flowers, and the partial bractææ situated half way up the flower-stalks, not near their base.

8. *A. septentrionale*. Blue Northern Wolf's-bane. "Koelle Acon. 22." Willd. n. 7. De Cand. n. 8. Ait. n. 6. (*A. lycotoxicon*; Linn. Fl. Lapp. ed. 2. 185. Tour in Lapland, v. 1. 36. 47. 278. v. 2. 123. 277. Fl. Dan. t. 123. Calceolus Lapponicus; Scheff. Lapp. 360.)—Hood conical, obtuse; spurs spiral; lips obovate. Leaves downy, divided more than half way, into from three to five divaricated sharply cut lobes. Partial bractææ at the lower part of each flower-stalk.—Native of mountainous thickets and pastures on the sides of the Lapland alps, and throughout Norway, as well as in some parts of Siberia, and on the Carpathian mountains. Linnæus noticed it also about the bases of the larger hills in Medelpad and Angermanland; but though he has recorded in Fl. Lapp. that the flowers are of a greyish-blue; not yellow, as described in all the accounts of *A. lycotoxicon*; yet he still supposed his to be the same species. His own specimen retains evident traces of this blue or grey colour, and answers to the distinctive characters of the *septentrionale*, as given by De Candolle. The leaves, as that excellent writer remarks, are more acutely toothed. With respect to the situation of the partial bractææ, they are rather on the lower part, than at the base, of the flower-stalks. The flowers are less downy, and of a thinner texture, than in *lycotoxicon*. Perhaps if living specimens were compared, better characters might be discovered, for there is every reason to presume this a distinct species. Linnæus in Fl. Lapp. speaks of the leaves being boiled and eaten with impunity; and in his Lapland Tour, v. 2. 123, records another instance of the same fact. He was justly astonished, knowing the poisonous quality attributed by all writers to *A. lycotoxicon*. Perhaps this may strengthen our opinion of these plants being truly distinct, for we find no record of the true *lycotoxicon* being used as food, in any state. Haller was one of the first botanists who suggested the propriety of separating these species; see his Hist. Stirp. Helvet. n. 1200. Yet there seems little reason for his wonder, there expressed, that this *Aconitum* should be fatal to wolves. When recent its qualities are probably very different.

9. *A. ochroleucum*. Pale Wolf's-bane. Willd. n. 4. De Cand. n. 9. Ait. n. 3. March. Taurico-Caucas. v. 2. 14, excluding the synonym of Tournefort.—Hood conical, elongated; spurs curved; lips lanceolate. Leaves deeply palmate, five-lobed, scarcely downy beneath; lobes deeply three-cleft, acutely jagged and toothed.—Found in mountainous meadows of mount Caucasus; frequent about the mineral springs of Narzana; flowering in summer. Communicated to us by Dr. Fischer. The habit entirely resembles *A. lycotoxicon*, but the surface of the herb is nearly smooth; the lobes of the leaves are more sharply toothed; and the spurs of the *neriaries* are rather curved than spiral. *Stem* erect, round, pale green, three or four feet high, with straight branches. *Cluster* long, branched at the bottom.

Lower

ACONITUM.

Lower bractæ in three or five segments, often reflexed; *upper linear*; *partial ones* in the middle of each *flower-stalk*, two lines long. *Flowers* pale buff, crowded, remarkable for their long and slender *hood*, measuring above an inch. *Stalks* shorter than the flowers. *Spurs* of the *nectaries* curiously involute.

10. *A. japonicum*. Japan Wolf's-bane. Thunb. Jap. 231. Willd. n. 2. De Cand. n. 10. (See Hufo of the Japarete.)—Hood conical, obtuse. Leaves palmate, three-lobed; lobes obtuse, cut; their segments rounded, with a point.—Gathered in Japan by Thunberg, who describes this species as allied to *lycoctonum*. The stem is round and smooth. Leaves stalked; their lateral lobes in two segments; middle one in three; all obtuse, deeply toothed; their teeth rounded, with a point. *Cluster* short. Thunberg.

Seçt. 3. *Napellus*.

Flowers blue or white, never buff-coloured; their hood convex, tapering into a point in front. Stem straight. Cluster cylindrical. Roots fibrous, from a rather tuberous stock. Leaves lobed in a palmate manner, many-cleft; their segments linear.

All the species of this section having been confounded under *A. Napellus*, De Candolle has thought right to lay aside that specific name entirely. But even he is doubtful whether they are not all one species!

11. *A. vulgare*. Common Monk's-hood. De Cand. n. 11. (*A. Napellus*; Linn. Sp. Pl. 751. "Koelle Acon. 14, with a figure." Woodv. Med. Bot. t. 6. Sm. Prodr. Fl. Græc. Sibth. v. 1. 372. *A. lycoctonum* 6, *Napellus vulgare*; Cluf. Hist. v. 2. 96. *Napellus*; Matth. Valgr. v. 2. 440. *N. verus caruleus*; Ger. Em. 972. *N. flore minore*; Rivin. Pentap. Irr. t. 130.)—Germs three, smooth. Wings hairy on the inside. Cluster cylindrical, elongated. Leaves in five divisions to the very base, with many linear acute segments, each with a longitudinal furrow on the upper side.—Native of mountainous meadows in most parts of Europe, from Switzerland, Germany, France, Spain, and Italy, to Greece, flowering in summer, and one of our most common garden plants ever since the days of Gerard. Dr. Leech sent us specimens from Scotland; but there is reason to doubt the plant's being really wild in Britain. De Candolle distinguishes this from all its relations, though, as he says, with difficulty, by the simple, straight, upright stem, almost always terminating in a simple cylindrical close cluster, and not corymbose; leaves with linear segments, that are hardly at all dilated at the extremity, marked with a furrow, and not resembling any others, except perhaps those of *A. tauricum*, whose cluster is the only one more dense than the present; hood convex, rather acute at the summit, but not gibbous or elevated at the back, as in *intermedium*, *rostratum*, and *variegatum*; wings hairy on the inside, which in *tauricum*, *paniculatum*, &c. are smooth; *germs* smooth, never more than three, not five, and hairy; *capules* six lines long, and not an inch, as in *A. neubergense*. The present species however, being very common, is extremely variable; the whole surface is sometimes quite smooth, sometimes downy, especially about the flowers; the furrow on the segments of the leaves is more or less distinct; the flowers naturally blue, or (in the variety called by Schultz *bicolor*) white at the base, blue at the summit, become in gardens white, rose-coloured, purple, or variegated. De Candolle. Their most usual and well-known colour is a deep and gloomy blue; we have seen no other. Dr. Sibthorp's Greek plant must rest on his own authority, being only mentioned in his MSS., without any accompanying specimen; nor were the species of this genus so accurately noted in his time.

12. *A. strictum*. Straight Monk's-hood. "Bernh. Monogr." De Cand. n. 12.—Germs three, smooth. Wings hairy on the inside. Cluster cylindrical, elongated. Leaves in five divisions to the very base; their lobes wedge-shaped, jagged at the summit.—Native country unknown. Closely related to the last, but differing in the three or five divisions of the leaves being wedge-shaped in their lower part, and cut at the extremity into oblong lobes, which are shorter, blunter, and twice as broad as in that; the cluster is shorter, with little short branches at its base. Perhaps this may not be sufficiently distinct from the following. De Candolle.

13. *A. neubergense*. Broad-leaved Monk's-hood. De Cand. n. 13. (*A. Napellus*; Herb. Linn. Jacq. Auftr. t. 382. Ehrh. Pl. Off. n. 87. "Palmst. Succ. t. 46." *A. lycoctonum*, vel *neubergense*; Cluf. Hist. v. 2. 96. Morif. sect. 12. t. 3. f. 11. *A. purpureum neubergense*; Ger. Em. 973. *A. foliorum laciniis linearibus, supernè latoribus, lineæ exaratis*; Linn. Hort. Cliff. 214. *Moræus* in Stockh. Transf. for 1739. 43. t. 2. *Napellus flore majore*; Rivin. Pentap. Irr. t. 131.)—Germs three, smooth. Wings hairy on the inside. Cluster cylindrical, elongated, lax; stalks downy, rather spreading. Leaves in five deep, wedge-shaped, three-lobed, jagged segments.—Native of alpine meadows in various parts of Germany, Hungary, Siberia, &c., flowering rather later than *A. vulgare*, and no less common in gardens than that species, with which it is generally confounded. Clusters having originally met with this plant in the greatest abundance on the mountain called Neuberger, in Styria, De Candolle has chosen the above specific name, which is indeed preferable to the mongrel one of *neomontanum*, adopted by some writers. The species before us is said to differ from *vulgare*, in having broader leaves, whose rather wedge-shaped divisions are more connected at the base; three-cleft and cut at the extremity, into acute segments, thrice the breadth of *vulgare*, and not marked with any furrow. The cluster also is more lax, its stalks always downy, more spreading, and longer than the flowers. The capules, according to Wahlenberg, are three, above an inch long, spreading, those in the middle part of the cluster exceeding the length of their stalks.

14. *A. tauricum*. Taurian Monk's-hood. Wulf. in Jacq. Coll. v. 2. 112. Jacq. Ic. Rar. t. 492. De Cand. n. 14. "Koelle Acon. 15." (*A. Napellus*; Bull. Fr. t. 45? De Cand. *A. lycoctonum quartum tauricum*; Cluf. Hist. v. 2. 95. *A. violaceum*; Ger. Em. 973.)—Germs three, smooth. Wings smooth. Cluster cylindrical, elongated, very dense; stalks smooth, shorter than the bractæ. Leaves in five divisions to the very base, somewhat pedate, with linear lobes.—Native of the alpine heights of Tauria, Carinthia, &c. flowering in summer. Very like *vulgare*, but the smooth wings and flower-stalks, the latter shorter than their bractæ; the short dense cluster, whose main stalk is concealed; and the pedate, more wedge-shaped, linear-lobed, scarcely furrowed leaves, are thought by De Candolle to afford sufficient differences.

Seçt. 4. *Cammarum*.

Flowers blue or white; hood very convex, or conical, ending, often abruptly, in a point in front. Cluster lax, somewhat corymbose. Stem straight. Leaves deeply divided, in a palmate manner, into wedge-shaped lobes. Roots navew-shaped, intermixed with small fibres.

For the same reason as concerns the last section, the specific name *Cammarum* is here laid aside, having been variously applied by different botanists. De Candolle suspects all the species of the present section, or at least the first four, may be varieties of each other!

ACONITUM.

15. *A. intermedium*. Ambiguous Monk's-hood. De Cand. n. 15. (*A. neomontanum*; Willd. n. 9, excluding the synonymus. "Hoppe Pl. Exsicc." *De Cand.* Thora italica, seu Napellus minor, flore cæruleo; Barrel. Ic. t. 610.)—Germens three, smooth. Wings internally hairy. Cluster lax; corymbose; stalks smooth. Hood very convex, somewhat conical.—Found in mountainous woody parts of Germany and Flanders, flowering in July. In habit like the two following, but the hairy wings; (De Candolle by mistake says *lipis*.) distinguish this species from all the rest of the section. We have seen no specimen.

16. *A. paniculatum*. Panicked Monk's-hood. Lamarck Franc. ed. 1. v. 3. 646. n. 1224. Dict. v. 1. 33. De Cand. n. 16. (*A. Napello simile*, fed minus, cæruleum, præcocius; Bauh. Hist. v. 3. 656. Chabr. Sciagr. 531. Napellus; Camer. Epit. 836. Storck Libell. 69. t. 3.)

β, cluster drooping. De Cand. (*A. cernuum*; "Koelle Acon. 17." Willd. n. 12. *A. lycopodium octavum*, comâ nutante; Cluf. Hist. v. 2. 97. *A. maximum nutante comâ*; Ger. Em. 971. *A. septimum*; Matth. Valgr. v. 2. 436. Camer. Epit. 832.)

Germens three, smooth. Wings internally smooth. Cluster lax, corymbose; stalks downy. Hood convex.—Found in various alpine parts of Europe, flowering towards autumn. The roots are roundish, tapering downwards, bearing many long fibres. Stem erect, smooth. Leaves somewhat pedate; their lobes wedge-shaped below, acutely pinnatifid upwards. Cluster usually erect, with long downy stalks; downy; the lower ones branched. Flowers large, of a brighter blue than *vulgare*, with a convex hood, whose point is more remarkable than in the 3d section. It may be important, if any person should repeat Storck's experiments, to be aware that this is the plant he used, and not our Common Monk's-hood, *A. vulgare*.

17. *A. rostratum*. Beaked Monk's-hood. De Cand. n. 17. (*A. Cammarum*; Lamarck Dict. v. 1. 33. Willd. n. 14? *A. lycopodium nonum judenbergense*; Cluf. Hist. v. 2. 97. *A. maximum judenbergense*; Ger. Em. 973. *A. lycopodium, flore maximo*; Bauh. Hist. v. 3. 659.)—Germens three, smooth, or only fringed at the inner edge. Wings smooth. Cluster somewhat corymbose, of few flowers, with smooth stalks. Hood conical, elevated, abrupt in front, with a prominent beak.—Native of the Austrian and Swiss alps, flowering in summer. We have it in Mr. Davall's herbarium, but the plant seems unknown to cultivators. The roots are roundish, tapering downward. Stem a yard high, straight, round, smooth, purplish. Leaves somewhat pedate, with wedge-shaped, jagged, acute lobes. This species differs from the preceding, as well as from the following, in the very large and high hood, accompanied by a very considerable beak, being conspicuous for the greater size, and rather paler blue, of its flowers.

18. *A. hebegynum*. Downy-fruited Monk's-hood. De Cand. n. 18. (*A. Cammarum*; Linn. Sp. Pl. 751? Willd. n. 14? Ait. n. 11? Jacq. Austr. t. 424.)—Germens from three to five, all over finely downy. Wings nearly smooth. Cluster rather corymbose, of few flowers; stalks downy. Hood convex, beaked in front.—Native of rugged bushy places on the alps of Switzerland, from whence we have it; as well as of Austria and the recesses of the Carpathian mountains, flowering in summer. A large handsome species, with ample foliage, whose segments are acutely pinnatifid. Flowers dark-blue; their hood rounded, much less elevated than in the preceding. The germens clothed with fine velvet-like down afford a clear specific character. There are no means of perfectly ascertaining the *A. Cammarum* of Linnæus, he having left no specimen, and his synonymus pointing

to different plants. His character of "*floribus subpentazymitis*" is all that indicates the present species, which is probably the plant of the gardens. De Candolle says all the synonymus of his first, or principal, variety of *paniculatum*, may just as well serve for *hebegynum*; but surely Storck's figure cannot be mistaken for this. The plants themselves can never be confounded, provided the germens be attended to; for which discovery we are indebted to professor De Candolle.

19. *A. variegatum*. Variegated Monk's-hood. Linn. Sp. Pl. 750. Willd. n. 13. Ait. n. 10. "Koelle Acon. 18." (*A. lycopodium decimum*, Thora italica; Cluf. Hist. v. 2. 98. *A. lycopodium cæruleum parvum*; Ger. Em. 971. Napellus flore mixto; Rivin. Pentap. Irr. t. 133.)—Germens three, smooth as well as the petals. Cluster lax; stalks smooth; the lower ones many-flowered, twice the length of their many-cleft bractæes; their lower partial bractæes cut. Hood elevated, conical, obtuse, with a short beak in front.—Native of woody rather alpine situations, in Carniola, Bohemia, and Italy, flowering in August. Root, according to Clufius, tuberous, with ovate knobs, or rather perhaps buds. Whole herb smooth. Stem erect, with spreading branches. Lower leaves on long stalks, their outline orbicular, their upper side of a shining green, lower pale; their three or five deep principal divisions wedge-shaped at the base, dilated and many-cleft at the extremity, with oblong acute segments; upper leaves sessile; floral ones in three deep divisions, copiously, but not deeply, cut. Lower stalks of the cluster distant, each bearing three or four flowers. Partial bractæes, which are under each flower, linear. Flowers large, perfectly smooth, blue (or blue and white); the hood very large, above an inch long, and extremely convex, not at all covering the wings, its beak short; wings orbicular, six or seven lines long; germens smooth, slender. De Candolle. This description answers to the Linnæan specimen, and nearly to our garden plant, except that we have always seen the flowers principally white, with a portion of blue on the beak and wings, and that the stem in ours is rather of the twining or wavy kind, as in the next section; by no means straight, though supporting itself. This character appears in the old wooden cuts, and may possibly have escaped M. De Candolle, only because, as he himself mentions, he had seen no other than a dried specimen. The figure of Rivinus indeed is erect, and yet, notwithstanding the annexed representation of five capsules, we can scarcely doubt that synonym.

20. *A. album*. White Monk's-hood. Ait. ed. 1. v. 2. 246. ed. 2. n. 5. Willd. n. 6. De Cand. n. 20. (*A. orientale*; Mill. Dict. ed. 8. n. 10. *A. lycopodium orientale, flore magno albo*; Tourn. Cor. 30. Napellus flore albo; Rivin. Pentap. Irr. t. 132?)—Germens four or five. Hood conical, with a long claw. Cluster lax, simple. Stalks erect. Leaves in three or five deep, ovate-wedge-shaped, three-cleft, toothed segments.—Found in the Levant by Tournefort, who sent seeds to the royal garden at Paris, and from thence, according to Miller, it came to England. Hence there can be no doubt respecting Tournefort's synonym; and yet his appellation of *lycopodium*, and the place in his *Infl.*, where he directs this species to be inserted, might favour the application of his synonym to *ochroleucum*, n. 9, as in the Flora Taurico-Caucasica. The plant of Aiton, and consequently of De Candolle, is totally different from the *ochroleucum*, and very near *variegatum*. The stem is described by Miller six feet high, or more. We have a specimen from Dr. Schrader, sent to be compared with *Napellus*, which appears to be this very species, and agrees well with the figure of Rivinus indicated above, except the flowers being blue; but that circumstance can

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be of no moment. The *stem* is round and smooth. *Leaves* smooth; their wedge-like lobes sharply pinnatifid. *Cluster* lax, with some axillary branches below. *Stalks* erect, smooth. *Hood* near an inch and a half long, obtuse, even, bent forward with a slightly recurved, notched, beak; its *claw* longer than the large round *wings*. *Germens* five, smooth.

SECT. 5. *Anabates*.

Flowers blue or white; hood convex. Cluster lax. Stem twining, climbing.

21. *A. eriophlemon*. Hairy-threaded Monk's-hood. De Cand. n. 21. ("A. volubile; Koelle Acon. 21, but not of Willdenow." De C.)—Stem twining, somewhat downy with clofe hairs. Footstalks naked. Leaves in three or five deep, pinnatifid lobes, with lanceolate segments. Cluster lax. Germens two or three, very smooth. Stamens hairy.—Gathered by Koelle in Siberia; cultivated at Montpellier. Stem round, its fine clofe hairs scarcely visible with a microscope. *Leaves* smooth, with distant, oblong, acute segments. *Upper branches* flowering at their extremities. *Lower bractees* in three or five divisions; upper oblong, undivided; partial ones linear. *Stalks* downy. *Flowers* pale blue, hardly at all downy; hood gradually tapering into an acute beak, with a space between it and the wings, which are fringed, but nearly or quite smooth on their inside. *Filaments* hairy! De Candolle.

22. *A. ciliare*. Fringed Monk's-hood. De Cand. n. 22. (A. volubile; Willd. n. 11, but not of Koelle. Ait. n. 9. Donn Cant. ed. 5. 135.)—Stem twining, clothed with spreading hairs. Footstalks fringed. Leaves in three or five deep pinnatifid lobes, with linear-lanceolate segments. Cluster lax. Germens five or more.—Native of woods in Siberia. We received a specimen in flower, in Sept. 1801, from the rich garden of the late Rev. Mr. Watts, of Ashill, Norfolk. The stem is round, slender, purplish, six feet high, varying in its degree of downiness. Leaves in three and figure not unlike *Malva moschata*. Cluster branched, lax. Flowers of a middle size, rather light blue, downy; hood convex, rounded, with a beak in front; spur hooked, with an obtuse, inversely heart-shaped, lip. Germens five or six, elliptic-oblong, smooth. Stamens smooth. Our specimen rather answers to the more hairy variety of De Candolle, which he suspected might prove a distinct species; we have seen no other, and can therefore form no opinion.

23. *A. tortuosum*. Twisted Monk's-hood. Willd. Enum. 576. De Cand. n. 23. (A. n. 8; Matth. Valgr. v. 2. 437? A. comâ inflexâ, foliis latioribus; Tourn. Infr. 425?)—Stem twining, smooth, as well as the footstalks. Leaves in three deep, ovate, pointed, coarsely and deeply toothed lobes. Cluster lax. Germens two or three, quite smooth, as well as the stamens.—Seen in a cultivated state only, by Willdenow and De Candolle, who knew not whence it came. The stem rises to the height of six or seven feet, branching, round, and smooth. Leaves smooth; their lobes wedge-shaped at the base; the lateral ones deeply cleft. Flower-stalks downy. Lower bractees three-cleft; partial ones awl-shaped, placed about half way up each stalk. Flowers smooth, pale blue; hood convex, gradually tapering into an acute beak. The figure of Matthioli expresses the habit, but may probably belong to some other species. De Candolle. Indeed many of that author's figures are curved, evidently to accommodate them to the dimensions of the wooden block.

24. *A. glabrum*. Smooth Twining Monk's-hood. De Cand. n. 24.—Stem twining, smooth like the footstalks. Leaves in five deep, lanceolate, wedge-shaped, coarsely and deeply toothed lobes. Cluster lax. Hood stalked, elongated,

conical, with a long, erect, cloven beak.—Native country unknown. Described from the herbarium of Professor Desfontaines. The whole herb is smooth. The flowers are pale blue, and remarkable for the long linear lobes which terminate the beak, and standing erect, are nearly on a level with the top of the hood, which appears to be the great peculiarity of this little-known species.

25. *A. uncinatum*. American Monk's-hood. Linn. Sp. Pl. 750. Willd. n. 15. Ait. n. 12. Pursh n. 1. Curt. Mag. t. 1119. De Cand. n. 25.—Stem somewhat twining, slightly downy. Footstalks smooth. Leaves abrupt at the base; lobes three or five, acute, with three teeth. Cluster lax. Hood stalked, elongated, convex.—In swamps, and by the sides of rivulets, on the high mountains of Virginia and Carolina, flowering in June and July. Flowers large, of a fine blue, and singular structure. *Pursh*. Stem round, somewhat branched, minutely downy. Footstalks smooth, round, with a longitudinal furrow. Leaves coriaceous, smooth, dark-green, lobed only about half down; lobes three-ribbed. Lower stalks of the cluster long and divided; upper simple and crowded; all downy in their upper part. Bractees two, oblong, not far from the flowers, which are large, of a rich violet purple; hood tapering into a sharp beak; wings orbicular, hairy rather than fringed. Germens three to five, downy. Such is our Linnean specimen, from J. Bartram.

M. De Candolle saw in the herbarium of Michaux, mixed with the above, specimens, whose hood was twice as long, almost conical, without any hook or beak. This he considers as the *uncinatum* of that author, Fl. Boreal.-Amer. v. 1. 315, and possibly a distinct species.

Mr. Pursh says,—"On the foot of the Peaks of Otter, and about the sweet springs, another species occurs, with smaller flowers, and a climbing stem which sometimes attains the height of nine feet; but unfortunately I have no materials at present to give a correct description thereof."

Hence it appears that the history of this long-established genus is not yet complete. M. De Candolle enumerates three species, of which he had not sufficient information to define them correctly. These are,

26. *A. delphinifolium*, of which there are three varieties. 1. *Americanum*, found by David Nelson, in Sledge (not Hedge) island, with an erect stem, from six to twenty inches high, downy upwards; leaves like *Delphinium pentagynum*, smooth, in numerous pinnatifid segments; and blue racemose flowers, whose hood is convex, acute at the summit. 2. *Sibiricum*, gathered in Siberia by Pallas, has larger flowers, with nectaries but half the length of the hood. 3. *Kamtschaticum*, has from three to six rather scattered, somewhat smaller, flowers, and rather longer nectaries. Root of tufted fibres. De Cand.

27. *A. biflorum*. (A. grandiflorum; Fischer Hort. Gorenk. 1808. 77.)—Native of the Altai mountains. Root tuberous, ovate, the size of a pea. Stem four inches high, slender, finely downy at the summit. Leaves in five deep, palmate segments, with linear acute lobes; the lowermost on long stalks. Flowers two, terminal, nearly sessile, pale blue; hood convex, externally downy at the back, tapering into an acute beak; wings obovate, or roundish, smooth. Stamens smooth. Germens three, villous. Nectaries hooked, obtuse, with very minute lips. De Cand.

28. *A. maximum*. Pallas herb.—Native of Kamtschatka. Stem six feet high, erect, round, smooth. Leaves smooth, stalked, wedge-shaped at the base, in three or five dilated, wedge-shaped, five-cleft lobes. Cluster short, of eight or ten pale-blue flowers, on downy stalks, with a convex acute hood, like that of *delphinifolium*, but smaller. De Cand.

The seven following are scarcely to be ascertained.

29. *A. nonum*; Matth. Valgr. v. 2. 438. Dalech. Hist. 1741. f. 2. *A. comā inflexā, floribus rarioribus, et foliis elegantior dissectis*; Tourn. Inft. 425.—We should suppose this an unnatural posture of *A. Anthora*, n. 1.

30. *A. lycocotium quartum, five lycneanum*; Cluf. Hist. v. 2. 96. Bauh. Hist. v. 3. 657.—No figure.

31. *A. ramofum, parvo flore*; Bauh. Pin. 183. Bauhin cites *A. octavum*, Matth. Valgr. v. 2. 437. See our n. 23.

32. *A. fpicā florum pyramidalī*; Morif. Præl. 226. *A. pyramidale multiflorum*; Tourn. Inft. 425. *A. pyramidale*; Mill. Dict. ed. 8. n. 6.—Esteemed by De Candolle a variety of *A. vulgare*, n. 11.

33. *A. feptimum*. Matthioli; Debry Floril. Nov. t. 42, but not the plant of Matthioli.

34. *A. minus autumnale infulzæ Cheufan, finicē Tjou-u*; Pluk. Amalth. 5.

35. *Napellus major cæruleus montanus, anthoræ radice*; Bocc. Musf. 74.—Native of Monte Cofcione, in Corfica.

ACOTYLEDONES, constitute a class of plants in the natural systems of most authors, but especially of Juffieu, in whose method this class stands first. In these the *coraculum* of the seed is defined to be delitute of cotyledons, and consequently undivided in the process of germination, though forming a root below, and more or less of a stem, or at least a frond, above. The parts of fructification in many of this tribe are obscure, anomalous, or altogether unknown. The orders in the above-mentioned writer are six; FUNGI, ALGÆ, HEPATICÆ, MUSCI, FILICES, and NAIADÆ; all which articles the reader will find in their proper places. From our account of *Musci* and *Filices* he may observe, that the denomination of the supposed natural class in question, and its essential character above-mentioned, are far from being universal or unexceptionable, though two orders having manifest cotyledons, or something equivalent; while many plants, supposed to have a solitary cotyledon, have really none at all. See the article MONOCOTYLEDONES, where this subject is discussed. See also COTYLEDONES and GERMINATION.

ACOUCHY. See AKOUSCHY.

ACOUROA, in *Botany*, apparently a vernacular name in Guiana, by which Aublet has chosen to designate a papilionaceous diadelphous plant, which Juffieu, with great reason, suspects to be a species of *PRONOCARPUS* (see that article); as well as another genus, named by the same author *Vatairea*. See Aubl. Guian. 753—756. t. 301, 302.

A. violacea, the only species, is a tree, found about the margins of salt-water creeks in Guiana, bearing flowers and fruit in July. The *trunk* is twelve or fifteen feet high, and a foot in diameter, sending out from its summit many spreading branches; the bark reddish, cracked, and wrinkled; the wood whitish externally, but the heart is reddish, hard and compact. *Leaves* alternate, alternately pinnate of seven or nine ovate, pointed, entire, firm, smooth *leaflets*, gradually larger upwards, the lowermost being an inch and a half or two inches long, the uppermost or terminal one four or five. *Stipulas* small, deciduous. *Clusters* about the ends of the branches, long, compound, many-flowered. *Braçteas* small, solitary at the base of each flower. *Calyx* of one leaf, in five sharp unequal segments. *Corolla* papilionaceous, violet-coloured. *Stamens* ten, diadelphous, the odd one distinct. *Stigma* obtuse. *Pericarp* dry, reddish, nearly orbicular, concave on one side, convex on the other, not burfing. Seed solitary, lenticular. *Aublet*.

The *Vatairea*, Aubl. t. 302, is a much larger tree, the *trunk* being fifty feet in height, with a smooth whitish bark, and light brittle wood. *Leaves* pinnate, as in the former,

but more elliptical. *Flowers* unknown. *Pod* flat on both sides, with a thick edge, chestnut-brown, of an irregularly orbicular shape, about three inches in diameter, containing one large seed; which, when beaten in a mortar with purified pork lard, is used to cure tetters or ring-worms, where the inhabitants of Guiana call this seed *Graine à dartres*. The tree grows by river sides in that country. *Aublet*.

ACQUACKNACK. Add, containing 2023 inhabitants.

ACRE, col. 3, l. 29. The tobacco of Acre is highly esteemed; and coarse mullins, remarkable for the durability of their dye, are sold at a low rate. The inhabitants make use of wooden tubes for their tobacco-pipes, garnished with a swathing of silk, or linen, for the purpose of absorbing water. This being kept moist, cools the smoke, as it rises, by the constant evaporation. A modern traveller, in the account of his Journey from Acre to mount Carmel, mentions the exportation to Venice of the sand of the river Belus for the glass-houses of that city. (See GLASS.) At Acre there are the remains of an ancient church, with pointed arches, other instances of which, demonstrating the existence of the Gothic architecture, occur in the Holy Land.

ACROSTICHUM, in *Botany*, a Linneæan name, whose meaning therefore is to be sought in the obscure hints left by its author. He derives the word in *Phil. Bot.* 183, from *ακροσ*, *top*, and *τιχον*, *an order or row*, but its application has been thought rather difficult. We agree with De Theis, that *ακροστιχον* literally means the beginning, or the first letters, words, or lines, of a set of verses; but we cannot assent to his explanation, of its being given to these plants "because several of them bear, on the back of the leaf, lines resembling the beginnings of words;" there being in fact no such thing, nor has Linneæus described any similar marks. It seems natural to trace his ideas in the appearance of the most remarkable of the original species, four of which are delineated in *Amen. Acad.* v. 1. t. 10, and in two or three of these, the *rows* of linear appendages, or *leaflets*, at the *top* of the *frond*, sufficiently explain the meaning of Linneæus. These species indeed are now removed from the established genus of *Acrostichum*, which has undergone much alteration since its first publication, and the view of its species already given, (see ACROSTICHUM,) requires to be totally reformed. Many of them are removed to other genera, while a great number of new ones have more than supplied their places. Willdenow, the latest general writer on *Filices*, which make the most original and accurate part of his *Species Plantarum*, defines sixty-two species, under six sections, of which we shall take a general view, first, as usual, prefixing the generic synonyms and characters.—Linn. Gen. 559. Schreb. 756. Willd. Sp. Pl. v. 5. 100. Mart. Mill. Dict. v. 1. Ait. Hort. Kew. v. 5. 500. Sm. Mem. de l'Acad. de Turin, v. 5. 147. Traçts 230. Prodr. Fl. Græc. Sibth. v. 2. 271. Swartz Syn. Fil. 9. Ind. Occ. 1587. Spreng. Crypt. Engl. ed. 84. t. 2. f. 18. Brown Prodr. Nov. Holl. v. 1. 145. Pursh 688. Juff. 15. Lamarck Dict. v. 1. 34. Illustr. t. 865. f. 4.—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices dorsifera*; sect. *annulata*.

Gen. Ch. *Capsules* globular, of two equal valves, bound by a jointed elastic ring, and disposed in broad, continued, indeterminate, dense masses, more or less intermixed with hairs, or fine scales, over the back of the *frond*; either entirely, or partially at the upper part of the whole, or of its segments or leaflets, which are often contracted, or otherwise changed, in their fructifying portions. *Involucrum* entirely wanting, (unless the above-mentioned hairs, or scales, be taken for such.)

Ess. Ch. *Capsules* occupying the back of the frond, in uninterrupted

ACROSTICHUM.

uninterrupted shapeless masses, either partially or entirely. Involutum none.

The whole genus, as it now stands, is chiefly tropical, a very few species only being found in the fourth of Europe, and one in North America. None are arborescent. The species removed from the catalogue of the genus, in our former article, are the following; and are thus disposed of by Willdenow, we believe, on the whole, very correctly.

- A. lanceolatum*, is *Polypodium acrostichoides*, Willd. Sp. Pl. v. 5. 156.
heterophyllum, *P. adnascens*, *ibid.* 145.
punctatum, Linn. Sp. Pl. 1524, *P. lingulatum*, 159.
spicatum, Sm. Pl. Ic. t. 49, *Lomaria spicata*, 289.
Lingua, *Polypodium Lingua*, 162.
basilatum, *P. tricuspis*, 163.
septentrionale, *Asplenium septentrionale*, 307.
australe, *A. australe*, 308.
pectinatum, *Schizara pectinata*, 85.
dichotomum, *S. dichotoma*, 87.
digitatum, *S. digitata*, 86.
ferrugineum, *Polypodium incanum* β , 175.
polypodioides, *P. incanum* α , 174.
rufum, *Hemionitis rufa*, 129.
punctatum, Linn. Suppl. 444, altered to *punctulatum* by Swartz, Syn. 13, retains the latter name in Willd. Sp. Pl. v. 5. 118.
areolatum, *Woodwardia angustifolia*, Sm. unjustifiably altered to *P. onocleoides*, *ibid.* 416.
marginalatum, *Pteris grandifolia*, 369.
sanctum, *Polypodium sanctum*, 198.
platyneuron, *Asplenium ebencum*, 329.
siliculosum and *thalictroides*, reduced to one species, as *Pteris thalictroides*, 378; but perhaps they require further investigation.
ilvense, *Polypodium ilvense*, 198. See WOODSIA.
furcatum, *Mertensia furcata*, 71; a genus under by Mr. Brown to *Gleichenia*. See that article, and *MERTENSIA*.
aculeatum, *Davallia fumaroides*, 480.
barbarum, *Todea africana*, 76, our *OSMUNDA barbara*.
visciparum, *Darea vivipara*, 302.
ferrulatum, *Grammitis ferrulata*, 141.
graminoides, *G. graminoides*, 141.

To which we must add that *A. ebencum* is made by Willdenow the variety β of *calomelanos*, 124; and *petiolatum* is reduced to *viscosum*, 103. Fifteen species therefore, out of our former list, are all that are retained by Willdenow, and the generic name remains with plants that do not by any means answer to it, though they agree correctly with the generic character.

We proceed to give examples of the several sections.

SECT. I. *Frons simple, undivided.* Twenty-five species. We shall here venture to unite two of them, *latifolium* and *longifolium*, adding a new one, *limbellatum*.

A. nummularifolium. Money-wort *Acrostichum.* Willd. n. 1. Swartz Syn. Fil. 419 and 191. t. 2. f. 1.—Barren fronds roundish, obtuse, somewhat heart-shaped; hoary and downy beneath: fertile ones obovate. Common stalk thread-shaped, fealy, creeping.—Found by Thunberg in Java. The common stalk creeps extensively, attaching itself by copious, tufted, black radicles, and bearing several alternate simple fronds, or leaves, not an inch long, on short partial foot-stalks; these are smooth on the upper side, veinless; and the hoary down of their under surface is interperfed with flarry hairs. The fertile fronds are fewer and smaller, tapering at the base, sometimes besprinkled with flarry hairs; their

backs covered with shining-brown capsules, intermixed with flarry hairs of a rusty hue. Swartz.

A. fimbriatum. Fringed *Acrostichum.* Willd. n. 3. "Cavan. Annal. de Nat. Scienc. v. 1. 102." Swartz Syn. Fil. 11.—Frons lanceolate, fringed. Stalks bristly.—Native of shady mountainous places in the kingdom of Quito.—We have been favoured with a specimen, gathered by William Swainson, jun. esq. of Liverpool, on damp rocks in woods, among the mountains at Rio Janeiro, which answers to the above definition, but we are not authorized, without better information, to assert that it is Cavanille's plant. The fronds of ours grow eight or ten together, in tufts, with a fibrous, blackish, scarcely hairy, root: each being an inch and a half long, one-third of an inch wide, blunthigh, shaggy on both sides with coarse, bristly, reddish-brown hairs, spreading copiously beyond the edges. Stalks simple, equally shaggy, rather longer than the fronds. The fertile fronds are convex above, almost hooded; their concave under surface covered with brown capsules. The size and habit of this fern resemble *Blechnum lanceola*, of Swartz, in Stockholm Transf. for 1817, 71. t. 3. f. 2, a native of Brazil; but the latter is smooth and naked, with the proper fructification and involucrem of a *Blechnum*.

A. viscosum. Glutinous *Acrostichum.* Willd. n. 8. Swartz Syn. Fil. 10 and 193. (*A. petiolatum*; Sw. Ind. Occ. 1588.)—Frons linear-lanceolate, pointed, smooth on both sides; their ribs, as well as stalks, scaly and viscid; fertile ones linear; hairy beneath and covered with capsules to the very margin.—Found on the mossy trunks of trees, on the highest mountains of Jamaica. Root slightly creeping. Stalks crowded, slender, angular, roughish, rusty and scaly, three or four inches high. Each frond is a span long, erect, rather rigid; the barren ones linear-lanceolate, pointed, somewhat membranous, smooth, besprinkled at the back with minute, prominent, brownish, glandular dots; their ribs scaly; fertile ones on longer stalks, more linear, either smooth or slightly hairy, covered entirely at the back with pale rusty powdery capsules. The clamminess of the stalks, and the hairiness of the fertile fronds, distinguish this species from its allies. Swartz.

A. limbellatum. Narrow-bordered *Acrostichum.* (*Lingua cervina angustifolia*, *costis* et *pediculis villosis*; Plum. Fil. 113. t. 129.)—Frons linear-lanceolate, wavy, pointed, smooth on both sides; their ribs and stalks hairy: fertile ones nearly linear, with a smooth naked border.—Gathered by Plumier, on mossy rocks about the source of a little rivulet, called Le Morne Rouge, near fort St. Pierre, in Martinico. The root is long, creeping, cylindrical, resembling a worm, covered with little black fibres. Fronds numerous, erect, above a foot high, each of their fine transverse veins ending in a little dot, before they reach the margin; at least such is their appearance in Plumier's figure. This character, the greater height of the fronds, and the fertile ones having a smooth naked border, over which the capsules do not extend, caused Dr. Swartz to omit citing Plumier's figure under the last-mentioned species. We have no doubt of these plants being very distinct from each other. Plumier is one of the few authors whose fidelity is always to be relied on, and he is therefore the sole authority for several of Linnaeus's species of ferns, described from his plates and descriptions.

A. villosum. Shaggy Bordered *Acrostichum.* Willd. n. 10. Swartz Syn. Fil. 10. Ind. Occ. 1592. (*Lingua cervina villosa minor*; Plum. Fil. 110. t. 127. f. D.)—Frons lanceolate, wavy, pointed, shaggy on both sides: fertile ones somewhat elliptical, with a naked border; fringed at the edge. Stalks hairy, elongated.—Gathered by Plumier

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mier in wet woods in Hispaniola; by Swartz on the hollow mossy sides of hills in the fourth of Jamaica. *Root* tufted, not creeping. *Stalks* about half as long as the *fronds*, shaggy with coarse rusty hairs, such as cover both sides of the leafy part, especially at the edges. There is a vacant space, as in the last, between the *capules* and the margin of the leaf, well expressed by Plumier, and mentioned by Swartz.

A. hirtum. Great Hairy Acrostichum. Willd. n. 11. Swartz Syn. Fil. 419 and 194.—*Fronde* elliptic-lanceolate, pointed, scaly on both sides, like their stalks; the margin dotted, and somewhat crenate: fertile ones much narrower, covered to the edge with capules and convoluted scales.—Suggested by Swartz to be a native of Madeira, but we have always believed our fine specimens to have been gathered by the late Mr. Smeathman, in the West Indies. The *root* is thick and scaly, apparently somewhat creeping. *Fronde* a span long, on scaly stalks often exceeding that length; thickly besprinkled sometimes on both sides, but especially on the under one, which is the palest, with small, ovate or heart-shaped, pointed, peltate, close-pressed scales, of a pale shining brown. Many of the transverse veins terminate, near the margin, in depressed dots. The fertile *fronds* are much shorter and narrower, somewhat heart-shaped at the base, covered entirely at the back with shining rusty *capules*, intermixed with lanceolate, convoluted, tubular scales. We have one *frond*, two-thirds of which are barren and broadly elliptical, but the upper part is suddenly contracted into a lanceolate form, covered with *capules* and scales. The main rib is always very scaly beneath.

A. undulatum. Wavy Hairy Acrostichum. Willd. n. 14. (Lingua cervina villosa, major et rufescens; Plum. Fil. 110. t. 126.)—*Fronde* ovato-lanceolate, somewhat wavy, bristly on both sides, like their stalks; the margin slightly crenate and obscurely dotted: barren ones emarginate: fertile ones acute.—Found by Plumier on the trunks of old trees, in Martinico. Nearly related to the last, but distinct. The *fronds* are smaller and narrower, with much less evident marginal dots. The bristly hairs, scattered over both surfaces, and also clothing the *stalks*, in some degree indeed partake of the nature of scales, and are channelled, or slightly tubular, at their base; but they totally differ from the flat close scales of the foregoing. The end of each barren *frond* is more or less emarginate, with a little tuft, or bud, of scales in the fissure.

A. latifolium. Broad-thick-leaved Acrostichum. Willd. n. 15. Swartz Syn. Fil. 9. Ind. Occ. 1589. (A. n. 1; Browne Jan. 104. A. longifolium; Willd. n. 16. Jacq. Coll. v. 2. 105. Swartz Syn. Fil. 9. Lingua cervina rigida et glabra; Plum. Fil. 118. t. 135.)—*Fronde* oblong-lanceolate, bordered, contracted at each end, smooth on both sides, as well as the stalks: fertile ones of the same shape, with a smooth, narrow, membranous edge. Native of rocks, and old mossy trunks of trees, in Jamaica and Martinico. The *root* is thick and creeping, clothed at the extremity, and about the bottoms of the stalks, with large, brown, chaffy scales. *Fronde* scattered, from a span to twelve or eighteen inches long, erect, entire, rigid, with a narrow, thin, membranous, entire border, a stout reddish rib, and scarcely any traces of veins, both surfaces being peculiarly even and smooth. The *stalks* are smooth and naked, angular, sometimes as long as the *fronds*, but generally shorter. The fertile *fronds* agree with the barren ones in shape and size, as well as in their narrow, membranous, naked border, but the whole under side, except that border, is densely clothed with innumerable, minute, snuff-coloured *capules*, unaccompanied by any scales or hairs. Jacquin described his plant independent of Swartz,

but we cannot find the leaf pretence for distinguishing them, even as varieties, the revolute position of the feed-bearing *frond*, in Plumier's plate, being merely owing to its young state, as his description implies. The *stalks*, at an early period, may probably be somewhat scaly, though afterwards naked, even in the fertile *fronds*.

A. crinitum. Hairy Oval Acrostichum. Linn. Sp. Pl. 1523. Willd. n. 23. Ait. n. 2. Swartz Syn. Fil. 11. (Lingua cervina villosa, amplis foliis subtrotundis; Plum. Fil. 109. t. 125. Phyllitis crinita, latifimo folio; Petiv. Fil. n. 145. t. 13. f. 14. copied from Plumier.)—*Fronde* elliptical, obtuse at each end, hairy, densely fringed. *Stalk* and mid-rib hairy.—Gathered by Plumier in Martinico. Brought from the West Indies to Kew Garden, by Admiral Bligh, in 1793. A very fine and large species, specimens of which are rare. Each *frond* is about a foot long, and half as much in breadth, fleshy; of a somewhat yellowish-green on the upper side, besprinkled with slender bristly hairs, which, as well as the thick fringe, and the copious hairs on the *stalks*, are coal-black. The fructification of this plant has not been ascertained, for what Plumier noticed, on the very young leaves, were most probably the tumid or glandular bases of the hairs; nor was he at all confident on this subject. It may well, however, by analogy, be considered as an *Acrostichum*. The *root* is tufted and shaggy. We place this fern next to species with which it most nearly accords; the following one being incorrectly inserted before it by Willdenow.

A. citrifolium. Lemon-leaved Acrostichum. Linn. Sp. Pl. 1529. Willd. n. 22. Swartz Syn. Fil. 9. (A. n. 3; Linn. Amoen. Acad. v. 1. 269. Hemionitis parastica; Linn. Sp. Pl. 1535. H. n. 2; Browne Jan. 95, from the author. Lingua cervina scandens, citrei foliis, minor; Plum. Fil. 101. t. 116. Lonchitis vanillie folio; Petiv. Fil. n. 150. t. 15. f. 1.)—*Fronde* alternate, ovate, pointed; tapering at the base, on short stalks, smooth, reticulated with veins. Common stalk creeping, scaly.—Found on trees near rivulets in Martinico, and in the cooler, shady, inland woods of the mountainous parts of Jamaica. The common *stem*, or main *root*, creeps to a great extent, among mosses, or *Jungermannie*, up the old trunks of trees, attaching itself by numerous shaggy radicles. It is clothed with large, acute, reticulated, finely toothed, pellucid scales. The *fronds* are situated alternately, about one or two inches from each other, on short bordered stalks, spreading in two directions, and are ovate or elliptical, of a fine shining green, rather fleshy, very smooth, two or three inches long, and one or one and a half broad, obscurely crenate. There is only about half way up any decided mid-rib, but the principal veins, parallel at first, branch out into regular, very elegant reticulations. Some of the uppermost and youngest *fronds*, according to Plumier, are entirely covered at the back, with minute, densely crowded, bright chestnut, *capules*, except a central naked line, indicating a mid-rib. We have no specimen in fructification, but several *capules* accidentally sticking to one of the barren *fronds*, are remarkably small, very pale, with dark jointed rings. Linnæus originally adopted this fern, as an *Acrostichum*, from Plumier. When he received specimens of the same from Browne, as a *Hemionitis*, he did not discover that he had already classed the plant in his system; hence it occurs twice, even in his Sp. Pl.—*Hemionitis obtusa*, Willd. Sp. Pl. v. 5. 127, agrees very nearly with this *Acrostichum*, in size and texture of the *fronds*, and most precisely in their veiny reticulations; but its fructification is described as essentially different.

SECT. 2. *Frond simple, divided*. Four species.

A. pel-

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A. pelatum. Shield Acrostichum. Willd. n. 26. Swartz Syn. Fil. 11. Ind. Occ. 1593. (Osmunda pelata; Swartz Prodr. 127. Lichen digitatus, geranii facie; Plum. Fil. 141. t. 50. f. A. Hepatica digitata fungoides; Pet. Fil. n. 188. l. 11. f. 3.)—Barren fronds in many forked, linear, radiating segments: fertile ones undivided, roundish-kidney-shaped, finely crenate.—Found on the mossy trunks of trees, in Jamaica and Hispaniola. This remarkable little fern has the habit of a *Trichomanes*; or of some very singular *Jungfermannia*, brought by Mr. Menzies from New Zealand. The trailing creeping root throws up several stalked, vertical, membranous, barren fronds, deeply divided into two principal lobes, and each of those irregularly into numerous, linear, single-ribbed segments, all spreading like a fan. The fertile fronds are about as tall, but smaller, not an inch broad, roundish, or somewhat kidney-shaped, horizontal; pale green and smooth above; covered beneath with small, brown, shining, annulated capsules.

A. aleicorne. Stag's-horn Acrostichum. Willd. n. 29. Swartz Syn. Fil. 12. 17. and 196. Brown n. 1. Ait. n. 3. ("A. Stenaria; Beauvois Fl. d'Oware, 2. t. 2.") *A. bifurcatum*; Cavan. Leccion. 241. n. 587. Neuroplatyceros aethiopicus, nervosifoliis, cornu cervinum referentibus; Pluk. Amalth. 151. t. 429. f. 2. Cornu alcis Simbor dicta; Bont. Hist. Nat. 121, with a figure.)—Frons somewhat tufted, forked, coriaceous, ribbed; downy at the back; from a peltate, leafy, spongy base.—Native of Guinea, Madagascar, Java, and New South Wales, growing on the trunks of trees. This is a very large and striking species, attached to the trees, or sometimes to rocks, by a peltate, dilated, somewhat membranous, irregular, veiny, lobed base, of a shining brown, a foot in diameter; thin at the edges; thick and spongy in the centre, where it is fixed by downy branching radicles, and from whence it throws up two or three erect, flat, irregularly forked fronds, a foot or two in height, rather dilated upwards, entire at the edges, from one to two inches broad in the different parts; tapering at the base into a stout, channelled, winged footstalk. The ultimate divisions are level-topped, linear, bluntish, near a finger's length, each bearing at its back, in the lower half, a broad, irregular, dense, naked mass of innumerable brown capsules, so disposed, in close lines, that the whole mass appears striated. The whole frond is strongly ribbed; green and smooth above; whitish and downy beneath; the ribs forked, smooth, reddish. We cannot but think the singular dilated base of this fern is no other than one of its seminal leaves, or reputed cotyledons, greatly enlarged, and more permanent than usual. *Polypodium quercifolium* of Linnaeus, Willd. Sp. Pl. v. 5. 170, has something analogous in its barren fronds, which are only advanced a step nearer towards the proper habit of a fern. See Ger. Em. 1133.

Seçt. 3. *Fronde ternate*. Two species.

A. quercifolium. Oak-leaved Acrostichum. Willd. n. 30. Swartz Syn. Fil. 12. Retz. Obf. fasc. 6. 39. "Schkuhr Crypt. 2. t. 3." (Osmunda trifida; Jacq. Coll. v. 3. 281. t. 20. f. 3.)—Frons ternate, bluntly lobed; fertile ones contracted, linear-oblong, somewhat cut.—Found on trees in Ceylon, by Koenig. A delicate slender fern, whose small, creeping, scaly root sends up several erect fronds, from six inches to a foot high, whose downy stalks are also scaly in their lower part. The terminal leaflet is much the largest, two or three inches long, and one broad, in the barren fronds, with downy ribs and edges, obtuse, slightly and variously sinuated; the lateral ones an inch long, rounded, somewhat lobed. The fertile

fronds have each a much taller smoother stalk, but their leaflets are, as usual, much smaller and narrower, their backs covered, except the ribs and margin, with minute, stalked, annulated capsules.

A. auritum. Eared Acrostichum. Willd. n. 31. Swartz Syn. Fil. 13. and 198. (Filix florida; Rumph. Amboin. v. 6. 78. t. 35. f. 1.)—Frons ternate, pinnatifid, cut; fertile ones doubly pinnate, with linear entire segments.—Native of Amboyna and Java, growing among coarse grasses, on the banks of rivers. *Rumphius, Tûnberg. Stalks* from one to two feet high, slender, angular, smooth, black and shining. *Frons* smooth, slightly veiny, of three principal leaves variously pinnatifid, lobed and cut, several inches long; the middle one largest: the fertile fronds are more compound, with extremely narrow linear leaflets or segments.

Seçt. 4. *Fronde pinnatifid*. Three species.

A. ferrulatum. Finely-ferrated Acrostichum. Willd. n. 32. (Polypodium fuscum tenuissimum denticulis ferratum; Plum. Fil. 63. t. 81.)—Frons deeply pinnatifid; segments linear-lanceolate, parallel; those of the barren ones finely ferrated, of the fertile ones entire.—Gathered by Plumier, in the forests of Hispaniola. The long, creeping, nearly smooth, blackish root sends up several fronds, twelve or eighteen inches high, on shortish smooth stalks. The outline of each is lanceolate, taper-pointed, composed of a great number of crowded parallel segments, divided almost to the mid-rib, each segment linear, acute, finely and sharply ferrated, smooth on both sides, thin and almost membranous, with a rib and many finely forked veins. From the very extremity of the root springs one frond, a little smaller than the rest, but of a similar structure, except that its segments are nearly all entire at the margins, and bear on their backs a dense assemblage of minute chestnut-coloured capsules, some few of the upper segments only, with the point, being naked and ferrated. By the figure, this fern would be judged a *Blechnum*, and possibly it might, if examined in a young state, prove to be such, the capsules extending over the leaf at an advanced period only, when the involucre is often reflexed, or obliterated; but as no botanist, besides Plumier, appears to have seen the plant, we must rely on his account of the matter, and he very precisely says the back of this fertile frond is at first, as it were, chagreen'd, and chestnut-coloured, being subsequently entirely covered with fine dust, of the same hue.

The others of this section are, *A. lepidopteris* of Langsdorff and Fischer, Ic. Fil. t. 2, from Brasil; and *A. brunneum* of Willdenow, from the Caraccas.

Seçt. 5. *Fronde pinnate*. Fifteen species, besides one of Mr. Brown's.

A. bifurcatum. Slender Forked Acrostichum. Willd. n. 35. Swartz Syn. Fil. 12. "Schkuhr Crypt. t. 2. f. 3." (Osmunda bifurcata; Jacq. Coll. v. 3. 282. t. 20. f. 4. Filicula corniculata infule Sanctæ Helenæ; Pluk. Mant. 83. Phyt. t. 350. f. 4.)—Frons pinnate; leaflets linear, deeply divided, spreading: those of the fertile fronds rounded; the lower ones more or less ternate; upper solitary.—Native of St. Helena and the West Indies. A slender delicate fern, allied in habit to *A. quercifolium*, described in the third section, but much smaller, and with very different barren leaflets. Its height is about six inches; the stalks wiry, or almost capillary.

A. forbifolium. Service-leaved Acrostichum. Linn. Sp. Pl. 1526. Willd. n. 38. Ait. n. 4. (Onoclea forbifolia; Swartz Syn. Fil. 112. Filix scandens latifolia ferrata; Plum. Amer. 8. t. 12. Lingua cervina scandens, foliis laurinis

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laurinis ferratis; Plum. Fil. 102. t. 117. *Lonchitis calamifera*, *pinnis ferratis*; Petiv. Fil. n. 153. t. 9. f. 8.)—Frons pinnate, smooth; leaflets of the barren ones lanceolate, pointed, ferratis; wedge-shaped at the base: of the fertile ones linear, entire. Common-stalk climbing, scaly.—This climbs up the stems of trees in various parts of the West Indies, the scaly *common stalk* being the thickness of a goose-quill. *Fronds* alternate, somewhat stalked, a foot long, lanceolate; barren *leaflets* an inch and a half or two inches long, half an inch broad; fertile ones rather shorter, and very much narrower; their edges slightly inflexed when young; the mid-ribs hairy; all the rest of the under surface densely covered with *capsules*. Linnæus, long after he had published this species, confounded with it a very different plant, figured in Sloane's Jamaica, v. 1. t. 38, and in Pluk. Phyt. t. 287, (not 286.) f. 3, which is preserved in the Linnæan herbarium; but for want of knowing the fructification, we cannot determine its genus with any certainty. The *main-stalk* of each *frond* is slightly winged, and the habit of the whole like a *DANÆA*, (see that article,) except the *leaflets* being alternate.

A. aureum. Great Golden Acrostichum. Linn. Sp. Pl. 1525. Willd. n. 41. Swartz Syn. Fil. 13. Pursh n. 1. "Schkuhr Crypt. 2. t. 1." (*Lingua cervina aurea*; Plum. Fil. 87. t. 104. *Filix palustris aurea*, *foliis linguæ cervinæ*; Plum. Amer. 5. t. 7. *Phyllitis ramosa aurea*; Petiv. Fil. n. 142. t. 8. f. 5.)—Fronds pinnate; leaflets alternate, uniform, coriaceous, oblong, bluntish, entire, smooth, with reticulated veins; wedge-shaped and unequal at the base: upper ones fertile, of the same size.—Native of bogs and wet places in the West Indies. Pursh found it in deep swamps near the sea-coast of Florida, in July. This is a noble *fern*, from five to nine feet high, conspicuous for its large broad *leaflets*, from a span to twelve inches in length, curiously marked with oblong veiny reticulations. About four or five of the uppermost, and perhaps the lower part of the next, are densely covered at the back with innumerable *capsules*, of a golden chestnut colour.

A. fraxinifolium. Great Ash-leaved Acrostichum. Br. n. 2.—"Fronds pinnate, smooth; leaflets stalked, oblong-tongue-shaped, pointed, entire, reticulated: upper ones fertile, contracted."—Discovered by Mr. Brown, in the tropical part of New Holland. Very closely related to *A. aureum*, but differing in its acute and short-pointed *leaflets*.

A. punctatum. Dotted Acrostichum. Willd. n. 45. Swartz Syn. Fil. 13. (*A. punctatum*; Linn. Suppl. 444, but not Sp. Pl. 1524. *A. auriculatum*; Lamarck Dict. v. 1. 36.)—Fronds pinnate; fertile leaflets lanceolate, acute, entire; dotted on the upper side; lowermost auricled; uppermost somewhat confluent.—Native of the ile of Bourbon. This species is known only from the Linnæan specimen, communicated by Thouin, which consists of one *frond*, about two feet high, entirely fertile, with a longish smooth *stalk*, and eight *leaflets*, each near three inches in length, and almost one in breadth, tapering at both ends, undulated or somewhat crenate; smooth and bright green, besprinkled with depressed dots, above; covered, nearly to the edge, with tawny capsules, beneath. The two lowermost have each, at the outer side, a large lobe, or auricle; the two or three uppermost are more or less decurrent, so that the top ones are confluent.

A. alienum. Various-lobed Acrostichum. Willd. n. 48. Swartz Syn. Fil. 13. Ind. Occ. 1595. (*Filix latifolia*, in *pinnulis obtusis, et leviter crenatis, divisa*; Plum. Fil. 10. t. 10. *Osmundæ pulverulenta*, *pinnis vix ferratis*; Petiv. Fil. n. 154. t. 8. f. 1.)—Fronds pinnate; leaflets pinnatifid; the upper ones confluent; lobes rounded, distantly

toothed, smooth, reticulated with veins; fertile ones with narrower, less divided, leaflets.—Found by Plumier in Martinico; by Swartz on the mountains of Jamaica. Our specimens came from St. Kitt's. This is a fine species, the *fronds* crowded, three or four feet high, smooth and membranous, of a fine transparent green; and the base of each *common stalk* tumid, permanent. The lower *leaflets*, a foot long, are deeply pinnatifid, and somewhat auricled; the middle ones roundly lobed; uppermost wavy, and strongly confluent. All the ribs are white and smooth. Fertile *fronds* entirely distinct, smaller and less divided or lobed in every part, but their segments are extremely various. The under side, except the ribs, is densely covered, to the very edges, with brown *capsules*. None of the *stalks* are scaly.

Sect. 6. *Frond doubly pinnatifid, or doubly pinnate*. Thirteen species, besides one of Mr. Brown's.

A. cervinum. Hart's-tongue Acrostichum. Willd. n. 50. Swartz Syn. Fil. 14 and 200. (*Osmundæ cervina*; Linn. Sp. Pl. 1521. *O. linguæ cervinæ foliis*; Plum. Fil. 132. t. 154. *O. racemifera*, *phyllitidis folio*; Petiv. Fil. n. 162. t. 8. f. 13.)—Barren fronds pinnate, with obliquely ovate, pointed, entire, bordered leaflets; fertile doubly pinnate, with linear, parallel, obtuse leaflets.—Apparently, by Plumier's account, not uncommon in wet woods, or about the banks of rivers, in Martinico. Dr. Swartz seems to have met with the same in Jamaica, and we have it from St. Kitt's. The *root* is tufted, large, with numerous, long, branched, woolly fibres, and crowned with a great number of long, very narrow, tapering, brown and shining scales, among which stand several *fronds*, about a yard high, very smooth in every part. The barren ones are simply pinnate, with 18 or 20 stalked *leaflets*, a span long, and near two inches broad, entire, taper-pointed, with one rib, and many fine parallel transverse veins, not reticulated; the base of each obliquely, and very unequally, wedge-shaped. Fertile *fronds* fewer, doubly pinnate, consisting entirely of numerous small, sessile, parallel, but not crowded, *leaflets*, a quarter or one-third of an inch in length, covered at the back with light-brown stalked *capsules*.

A. Marantæ. Scaly European Acrostichum. Linn. Sp. Pl. 1527. Willd. n. 53. Swartz Syn. Fil. 14. Prodr. Fl. Græc. n. 2344. Fl. Græc. t. 964, unpubl. "Schkuhr Crypt. 4. t. 4." Sprengel Crypt. 89. t. 2. f. 18, not good. (*Lonchitis alpina Marantæ*; Camer. Epit. 666.)—Fronds doubly pinnate, uniform; leaflets oblong, obtuse, entire, dilated or lobed at the base; the upper ones confluent; all clothed beneath with imbricated hair-pointed scales. Stalks shaggy.—We have already described this fern (see the article *NOTHOLENA*, n. 1); but a more careful examination has induced us, both here and in the Prodr. Fl. Græc., to retain it in *Acrostichum*, as well as the two following species; for the *capsules* appear to cover every part of the under side of its *fronds*, except their scaly mid-rib. With respect to *Notbolana trichomanoides*, we readily concur with Mr. Brown in keeping it distinct from *Pteris*; not having seen his *N. vellea* or *Pumilio*, we cannot form an opinion of those species.

A. velleum. Woolly European Acrostichum. Willd. n. 54. Swartz Syn. Fil. 14. Ait. n. 5. Prodr. Fl. Græc. n. 2345. Fl. Græc. t. 965, unpubl. (*A. lanuginosum*; Desfont. Atlant. v. 2. 400. t. 256. "Schkuhr Crypt. 8. t. 1. *Lonchitis mollior lanuginosa*, *Ceterach facie*; Barrel. Ic. t. 857, 858. *Filicula crispâ*, *lanugine hepatici coloris vestita*, *ex infulis fortunatis*; Pluk. Almag. 150. Phyt. t. 281. f. 4.)—Fronds doubly pinnate, elliptic-oblong, uniform; leaflets obtuse, ovate or heart-shaped, notched laterally; very shaggy on both sides, like the stalks.

—Native

—Native of Spain, Barbary, Madeira, and Zante, in the fissures of rocks. Rather smaller than the last, with shorter stalks and denser fronds, whose leaflets are short and rounded, hairy on both sides rather than scaly; their common stalks of a mahogany colour, their pubescence hoary, without the golden, or bright copper, hue of *A. Marantæ*. The root is neither scaly, nor creeping.

A. difans. Distant-winged Acrostichum. (Notholæna difans; Brown Prodr. v. 1. 146.)—Fronds doubly pinnate, linear-lanceolate, uniform; branches opposite, distant, somewhat deltoid; leaflets oblong, obtuse; the lower ones pinnatifid. Stalks and ribs shaggy, with hair-pointed scales. (See NOTHOLÆNA n. 2.) The *capules* decidedly cover every part of the under side of each leaflet, except the scaly rib, in as broad and continuous patches, as in any other Acrostichum; at least when, like our specimen, they are arrived at maturity.

A. sulphureum. Sulphur-coloured Acrostichum. Willd. n. 56. Swartz Syn. Fil. 15. Ind. Occ. 1597. Schkuhr Crypt. 4. t. 4.—Fronds doubly pinnate; leaflets oblong-wedge-shaped, pinnatifid, cloven and notched; clothed with pale yellow powder at the back.—Native of shady rocks, in the southern part of Jamaica. Swartz. Linnæus had numerous specimens of this fern, which he left undetermined, or perhaps confounded with the following, from which they differ in the wedge-like shape, and more delicate texture, of their leaflets, as well as the pale sulphur colour of the powder that covers their under surface. The masses of capules are most dense about the middle of each leaflet, the tips being naked.

A. calomelanos. Mealy Acrostichum. Linn. Sp. Pl. 1529. Willd. n. 57. Hort. Berol. t. 41. Swartz Syn. Fil. 15. "Schkuhr Crypt. 4. t. 5." (Filix albisimo pulvere confersa; Plum. Fil. 30. t. 40. Pet. Fil. n. 156. t. 9. f. 11. F. non ramosa major, caule nigro, furculis raris, &c.; Sloane Jam. v. 1. 92. t. 30. f. 2. Adiantum, nigro simile, albisimo pulvere confersum; Plum. Amer. 30. t. 44. *A. calomelanos americanum*; Pluk. Phyt. t. 124. f. 3.)

β. A. ebeneum; Linn. Sp. Pl. 1528? (Filix non ramosa minima, caule nigro, furculis raris, &c.; Sloane Jam. v. 1. 92. t. 53. f. 1.)

Fronds doubly pinnate; leaflets elliptic-oblong, clothed with white powder beneath; lowermost cut or pinnatifid, with an auricle from the upper edge at the base; upper ones serrated; uppermost confluent.—Native of shady situations in the West Indies. The fronds are thick and, when full grown, 12 or 18 inches high, with black shining stalks; the leaflets smooth, and of a fine deep green above; tapering, or wedge-shaped, at their base; in the upper part of each frond decurrent. Those which bear capules are less white, and rather grey, beneath, besprinkled with white dots, the capules most crowded about the middle region of each. Willdenow, on the positive assertion of Swartz, makes *A. ebeneum* of Linnæus a variety, Swartz esteeming it the same plant in a young state, when the fronds are only simply pinnate. But Willdenow declares that he had 100 times raised *calomelanos* from seed, without ever seeing the young fronds as represented by Sloane, t. 53. f. 1; and that his own figure was taken from a plant of one year's growth. Still we are disposed to believe Sloane's plant belongs to *calomelanos*; though it is far otherwise with the Linnæan *ebeneum*, the original specimen of which is simply pinnate, with broad, sessile, transverse, partly pinnatifid, leaflets, white beneath; the masses of capules nearer the margin than the rib. The upper leaflets, indeed, are decurrent and confluent.

Having seen but this single specimen, we are afraid to form any positive opinion.

A. chrysophyllum. Golden Acrostichum. Willd. n. 58. Swartz Syn. Fil. 15. Ind. Occ. 1598. (Filix aurea, pinnulis rotundè incisitis divisa; Plum. Fil. 33. t. 44. Adiantum pulverulentum aureum; Petiv. Fil. n. 160. t. 9. f. 9.)—Fronds doubly pinnate; leaflets ovate-oblong, obtuse, striated, polished; clothed beneath with deep yellow powder; lower ones pinnatifid; upper confluent and wavy.—Native of rather mountainous pastures, in various parts of the West Indies. We are indebted to J. V. Thompson, esq. for a specimen of this elegant plant, which is conspicuously distinguished by the copious deep lemon-coloured powder, entirely covering the back of its leaflets, among which the capules seem sparingly, but uniformly, dispersed and sunk.

A. albidulum. Whitish Round-leaved Acrostichum Willd. n. 61. Swartz Syn. Fil. 16 and 205. t. 1. f. 2.—Fronds doubly pinnate; leaflets rounded, obtuse; powdery and white beneath; lowermost three-lobed; uppermost simple and undivided. Capules densely crowded towards the margin.—Gathered by Louis Née, in South America. Swartz. A delicate little fern, three or four inches high, with a capillary stalk. The whole frond is oblong, once or twice compounded, in a ternate manner. Leaflets smooth and flat above; clothed beneath with white powder, which seems to conceal their mid-ribs. The capules are brown, each with a shining ring, and are very numerously crowded, in dense masses, over two-thirds of each lateral portion of the leaflet, from the edges, leaving a bare stripe in the middle. Hence this species should seem referable to Mr. Brown's genus NOTHOLÆNA, to which we have already alluded (see that article); but the capules compose much broader masses than in *N. trichomanoides*, and seem unattended by hairs.

A. pteroides. Bordered Acrostichum. Brown n. 3.—"Fronds doubly pinnate, smooth; leaflets linear, reflexed at the margin."—Gathered by Mr. Brown, in the tropical part of New Holland. This species seems to answer to the character of Willdenow's *Lomaria*. We have seen no specimen.

ACROTRICHE, so called by Mr. Brown, from *ακρο-*, terminal, and *τριχη*, *τριχες*, a hair, in allusion to the bearded points of the corolla.—Brown Prodr. Nov. Holl. v. 1. 547.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Eparicidez*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of five erect, concave, obtuse, permanent leaves, with a pair of smaller ones at their base. *Cor.* of one petal, funnel-shaped, longer than the calyx; limb in five equal, spreading segments, each furnished, towards the point, with a tuft of hairs directed inwards. Nectary a cup-shaped gland, slightly lobed, surrounding the base of the germen. *Stam.* Filaments five, thread-shaped, equal, inserted into the tube of the corolla, and not projecting beyond the mouth; anthers roundish-oblong, incumbent. *Pist.* Germen superior, globose; style columnar, short; stigma simple. *Peric.* Drupa globular, depressed, slightly pulpy. *Nut* solitary, of five lobes and five cells, its surface minutely cellular. *Seeds* solitary.

Eff. Ch. *Outer* calyx of two leaves. *Corolla* five-cleft, funnel-shaped; segments with a deflexed beard at the extremity. *Drupa* nearly dry. *Nut* of five cells, its surface minutely cellular.

This genus, the produce of New Holland, consists of humble much-branched shrubs, their branches generally divaricated. *Leaves* scattered. *Spikes* short, lateral, or axillary. *Flowers* small, white. *Drupa* small, with but little

little thickness, or pulp. We have examined only one specimen of this fruit, but the above appears to be the true meaning of the author whom we follow, that the shell of the nut is covered with small external cells, like a minute irregular honey-comb, to which the pulp of the drupa, filling the interstices of the lobes of the nut only, is attached. This character Mr. Brown seems to consider as very peculiar.

1. *A. divaricata*. Spreading-leaved Acrotriche. Br. n. 1.—Leaves lanceolate, pointed, divaricated, flat, green on both sides. Spikes axillary.—Found by Mr. Brown, at Port Jackson, New South Wales. We are not certain of having met with this species, among the various specimens sent by Dr. White, though one of them answers nearly to the characters, as far as we are able to investigate them. This specimen greatly resembles *MONOTOCA scoparia* (see that article); but the leaves are more divaricated, or deflexed, and not glaucous at the back.

2. *A. aggregata*. Aggregate Acrotriche. Br. n. 2.—“Leaves oblong-lanceolate, rather concave; glaucous beneath; smooth at the edges.”—Observed by Mr. Brown, in the tropical region of New Holland.

3. *A. ramiflora*. Flowery-branched Acrotriche. Br. n. 3.—“Leaves linear-lanceolate, pointed, divaricated; ribbed, and discoloured, beneath; recurved at the edges. Spikes small, situated on the branches.”—Gathered by the same distinguished botanist, on the southern coast of New Holland.

4. *A. ferrulata*. Finely-ferrated Acrotriche. Br. n. 4.—“Leaves linear-lanceolate, spinous-pointed, spreading, hairy or nearly smooth; their edges fringed. Spikes axillary.—Gathered by Mr. Brown in Van Diemen’s island, as well as on the south coast of New Holland. We have specimens collected by general Grose, communicated by A. B. Lambert, esq. A small dwarf shrub, with densely tufted, hairy branches. Leaves crowded, one-third or half an inch long, each tipped with a yellowish prickle; three-ribbed, and rather glaucous, beneath; more or less hairy on both sides; their edges fringed with minute stiff hairs, as if ferrated. Flowers in short, lateral, erect clusters. Drupa the size of hemp-seed, depressed, glaucous, or rather silky. Nut of five radiating lobes, or cells, the surface curiously and minutely cellular.

5. *A. patula*. Spreading-branched Acrotriche. Br. n. 5.—“Leaves ovato-lanceolate, spinous-pointed, flattish, divaricated as well as the branches. Spikes small, axillary.”—Native of the southern coast of New Holland. *Brown*.

6. *A. ovalifolia*. Oval-leaved Acrotriche. Br. n. 6.—“Leaves ovate or elliptical, obtuse, pointless, flat, smooth-edged. Spikes axillary. Drupa slightly cellular.”—Gathered by Mr. Brown in the same country as the last.

7. *A. cordata*. Heart-leaved Acrotriche. Br. n. 7. (*Styphelia cordata*; Labill. Nov. Holl. 46. t. 63.)—Leaves heart-shaped, flat; striated beneath. Flowers axillary, solitary or in pairs.—Found by Labillardiere, in Van Leuwin’s land. A span high, erect, with small, rigid, thick leaves. Drupa scarcely bigger than mustard-seed. Mr. Brown, not having seen this plant, is not absolutely certain of its genus; though Labillardiere’s description of the corolla answers to *Acrotriche*.

8. *A. depressa*. Prostrate Acrotriche. Br. n. 8.—“Leaves ovate, somewhat heart-shaped, pointed, divaricated; convex above; veiny beneath. Stem depressed. Spikes small, on the branches.”—Gathered by Mr. Brown, on the south coast of New Holland without flowers, and with unripe fruit.

ACT of Faith, 1. 2, day which was held; and let the

whole article refer to past time. To the article subjoin, such were the horrors of the inquisition in the reign of Philip II. *Auto da-Fes* have not been frequent in late times; and it is perhaps more than half a century since the last, in which criminals were burnt.

ACT of Honour, in Commerce, an instrument drawn by a notary, when a bill is accepted for the honour of another person.

ACTS, in Poetry, col. 2. l. ult., dance, are indeed divided; but to compensate for this retrenchment, the two concluding dances are *Ipun*, &c.

ACTÆA, in Botany, see our former article, (thus named, it is generally thought, from *ακτις*, the *spore*, as being a plant that inhabits the sea-coast, or the margins of waters. But this is not appropriate; and we should rather suppose Linnæus, the author of the name, had in his mind the resemblance of the plant, in some respects, to Elder, *ακλας* of the Greeks.)—*De Cand. Syst. v. 1. 381. Linn. Gen. 261. Schreb. 349. Willd. Sp. Pl. v. 2. 1139. Mart. Mill. Dict. v. 1. Sm. Fl. Brit. 562. Prodr. Fl. Græc. Sibth. v. 1. 356. Ait. Hort. Kew. v. 3. 286. Pursh 366. Juss. 235. Lamarck Illustr. t. 443. Gært. t. 114. (Christophoriana; Tournef. t. 154. Cimicifuga; Linn. Syst. Veg. ed. 14. 505. Am. Acad. v. 8. 193. Schreb. 369. Willd. Sp. Pl. v. 2. 1244. Mart. Mill. Dict. v. 1. Ait. Hort. Kew. v. 3. 324. Pursh 372. Juss. 234. Lamarck Illustr. t. 487. Gært. t. 140.)—Class and order, *Polyandria Monogynia*, (or rather perhaps *Pentagynia*.) Nat. Ord. *Multiflorique*, Linn. *Ranunculaceæ*, Juss. *Spuriz*, *De Cand.**

Eff. Ch. Calyx of four leaves. Petals four. Germans one or more, superior, ovate. Stigma nearly sessile. Pericarp of one cell, with many seeds.

Perennial herbs. Leaves stalked, simple, lobed, or variously cut, imitating compound leaves, according to *De Candolle*; (most of them are certainly compound.) Flowers racemose, white; calyx and corolla very fugacious; stamens generally longer than the petals. Number in the parts of the flower very variable. Stamens sometimes imperfect in one flower, pistils in another.

The roots are drastic purges, in some degree poisonous, and the herbage is not to be trusted.

Eight species are wild in bushy rocky ground, or cold woods, of the northern hemisphere; one in Europe; in Siberia or Japan two; in North America five.

This genus is very natural, notwithstanding a diversity of characters in the several species. In the *Cimicifuge*, (which approach *Xanthorrhiza* and *Pæonia*;) the germens are numerous, which, as in true *Ranunculaceæ*, become aggregate fruits, bursting at their inner angle. The second section, *Macrotis*, has a similar but solitary fruit, nor ought it to be separated from the *Cimicifuge*, any more than *Consolida* from *Delphinium*. *Aëæa* of Linnæus, the third section, has likewise a solitary fruit, exactly similar as to internal structure, but fleshy; yet not more to be separated on that account, than the somewhat berried species of *Glematis* from the rest. From these considerations, and the hints of Michaux and Richard, I return to the original opinion of Linnæus, and distribute *Aëæa* as follows. *De Candolle*.

We would observe, in support of this decision of our learned friend, that the anomalies in the fruit of *Fumaria*, whence many genera have been formed, appear to us analogous to these of *Aëæa*. We are always happy to concur in the definition and confirmation of natural genera, in preference to the endless splitting and subdividing of such into artificial ones; which last, being the easiest of all things, is most tempting to a beginner, especially as he thinks that, in pursuing it, he is exercising great sagacity, and refining on

on the wisdom of ages. We should however certainly keep *Aëta* and *Cimicifuga* separate, were it not for *Macrotys*, which evidently, and almost necessarily, combines them.

SECT. 1. *Cimicifuga*. Fruit aggregate, burbling. Species one to four.

SECT. 2. *Macrotys*. Fruit single, burbling. Species five and six.

SECT. 3. *Christophoriana*. *Fruit single, not burbling. Species seven and eight.

SECT. 1. *Cimicifuga*. Linn.

Flowers with many styles. Fruit dry, burbling, aggregate.

1. *A. Cimicifuga*. Bug-wort Actæa. De Cand. n. 1. Linn. Sp. Pl. 722. (*Cimicifuga*; Gmel. Sib. v. 4. 181. t. 70. Linn. Am. Acad. v. 2. 354. *C. fortida*; Linn. Syst. Nat. ed. 12. v. 2. 659.)—Germens four, nearly sessile, very hairy. Clusters paniced. Leaves divided in a once or twice ternate manner; their segments ovato-lanceolate, deeply toothed.—Native of various parts of Siberia, and of the north-west coast of America. See our former article *CIMICIFUGA*.

2. *A. podocarpa*. Stalked Actæa. De Cand. n. 2. (*Cimicifuga americana*; Michaux Boreal.-Amer. v. 1. 316.)—Germens four or five, stalked, smooth. Clusters paniced. Leaves twice compound.—Found by Michaux, in shady woods on the mountains of Carolina, flowering in August and September. Herb two feet high, with the habit of *A. racemosa*. Calyx of five ovate, concave leaves. Capsules four or five, smooth, compressed, pointed with the styles, and each supported by a stalk half its own length. De Cand.

3. *A. cordifolia*. Heart-leaved Actæa. De Cand. n. 3. (*Cimicifuga cordifolia*; Pursh 373; excluding the synonym.)—Germens two or three, smooth, sessile. Clusters paniced. Leaves divided in a twice ternate manner; their segments five or seven lobed, ferrated, heart-shaped at the base.—In shady woods on high mountains of Carolina, flowering in July. Resembles *A. Cimicifuga* very much in general habit. Pursh. Like *A. racemosa* and *podocarpa*, differing from the former in having numerous capsules, from the latter in their being sessile. Leaves smooth, their broad segments, (we should say leaflets,) almost resembling vine-leaves. Clusters elongated, wand-like, paniced, smooth, with a little acute bractæa under each partial stalk, and two smaller lateral ones at its base. De Cand.

4. *A. palmata*. Palmate Actæa. De Cand. n. 4. (*Cimicifuga palmata*; Michaux Boreal.-Amer. v. 1. 316. Pursh 373. Hydrastis; Lamarck Illustr. t. 500, which therefore is to be struck out of our article *HYDRASTIS*. “*H. canadensis*; Poir. Suppl. to Lam. Dict. v. 3. 71, but not of Linnæus.”)—Germens twelve to fifteen, in a roundish head. Clusters somewhat paniced, forked. Leaves palmate.—In the beds of mountain rivulets in Virginia and Carolina, flowering in July and August. A very tall and handsome plant; the leaves very large, and the flowers in great abundance. Pursh. The whole plant is smooth. Stem erect, simple, hollow. Leaves two, alternate; the lower one with a broadish stalk, an inch and a half long; the upper nearly sessile; both wedge-shaped at the base, very broad, with from three to five oval lobes, rather acute, and cut or serrated in their upper part. Flowers terminal, corymbose; their stalks forked, minutely downy; single-flowered and naked at the extremity; bractæated below. Calyx of four orbicular leaves. Germens distinct, crowded into a head. De Cand.

SECT. 2. *Macrotys*. “Raf. Schmalz in Bot. Journ. v. 2. 170.”

Flowers with a single style. Fruit dry, burbling.

5. *A. racemosa*. Long-clustered Actæa, or Black Snake-

root. Linn. Sp. Pl. 722. De Cand. n. 5. Willd. n. 2. Ait. n. 2. See ACTÆA n. 2. (*Cimicifuga serpentaria*; Pursh 372. *Christophoriana americana procerior et longius spicata*; Dill. Elth. 79. t. 67.)—Pistil one. Clusters very long. Fruit dry, burbling. Leaves divided in a thrice-ternate manner, ferrated, and somewhat cut.—In shady stony woods, from Canada to Florida, flowering in July and August. Pursh. Herbage like *A. spicata*, but larger; flowers like *A. Cimicifuga*, but monogynous; fruit like *A. cordifolia*, but of a single capsule. It varies however occasionally with two pistils. Clusters downy, very long and dense. Flowers pale, fetid, with small, thick, gibbous, stalked petals, each tipped with a bristly point. Capsules of two valves. Seeds oblong. De Cand. This species is often cultivated in England, as a hardy perennial. The copious white flowers are ornamental, but intolerably fetid, like the scent, well known to furgeons, of a carious bone. The plant is often six or seven feet high.

6. *A. japonica*. Japanese Actæa. Thunb. Jap. 221. De Cand. n. 6. Willd. n. 3.—Pistil one. Spikes very long. Leaves in three heart-shaped, palmate divisions, with from three to seven lobes.—Gathered in Japan by Thunberg, who describes it thus. Herb entirely smooth. Leaves stalked, ternate; leaflets stalked, simple, heart-shaped, cut, with five or seven notched lobes, ferrated, a palm in length and breadth; pale underneath. General and partial footstalks striated, longer than the leaflets. Spike from a palm to a span in length. Calyx and corolla soon falling. Germen oblong, smooth. Style none. The author gives no account of the fruit, so that it is impossible to say whether this species belongs to the second or third section.

SECT. 3. *Christophoriana* of Tournefort.

Fruit single, pulpy, not burbling.

7. *A. spicata*. Black-berried Actæa, or Herb Christoph. Linn. Sp. Pl. 722. Willd. n. 1. Ait. n. 1. Fl. Brit. n. 1. Engl. Bot. t. 918. Bull. Fr. t. 83. Fl. Dan. t. 589. (*Christophoriana*; Clus. Hist. v. 2. 86. Ger. Em. 979. Lob. Ic. 682.)—Pistil one. Berry nearly globular. Petals as long as the stamens. Cluster ovate. Leaves divided in a twice or thrice ternate manner; segments ovato-lanceolate, ferrated and cut.—Native of moist and shady mountainous situations, in most countries of Europe; very rare in England, being confined to the north-west part of Yorkshire; flowering in May. Roots fibrous. Berries always black. See ACTÆA n. 1.

8. *A. brachypetala*. Red or White-berried Actæa. De Cand. n. 8. (*A. americana*; Pursh 366. *A. spicata* β et γ; Willd. n. 1. Ait. n. . . *A. rubra*; Willd. Enum. 561. Bigelow Bot. 129. *Aconitum bacis niveis et rubris*; Cornut. Canad. 76. t. 77. Morif. sect. 1. t. 2. f. 7.)—Pistil one. Berry ovate-oblong. Petals shorter than the stamens. Cluster ovate. Leaves divided in a twice or thrice ternate manner; segments ovato-lanceolate, ferrated and cut.—In shady rocky woods, in rich vegetable mould, from Canada to Virginia, principally on the mountains, flowering in April and May. Known by the name of Red and White Cohosh, and considered by the natives as a valuable medicine. Pursh. Root more tuberous than in the last. De Cand. Berries bright red, or white; there is said to be a blue-berried variety also. A plant with smaller white berries, tipped with red, on large thickened stalks, is thought by Dr. Bigelow a distinct species. His specimen justifies this opinion, and differs also in the terminal leaflets being ovate, not three-lobed. This merits further enquiry.

ACTINEA, from *ακτις*, a ray; meaning merely a radiated flower; nor is there any thing unusual or striking, relative to the part in question in the instance before

us.—“Juff. in Ann. du Muf. v. 2. 425.” Willd. Sp. Pl. v. 3. 2213.—Clafs and order, *Syngenefia Polygamia-fuperflua*. Nat. Ord. *Compoſite diſcoideæ*, Linn. *Corymbifereæ*, Juff.

Gen. Ch. *Common Calyx* nearly flat, of many ſpreading, lanceolate, ſomewhat imbricated, nearly equal, permanent leaves, ſhorter than the florets. *Cor.* compound, radiated; *ſlorets* of the diſk perfect, numerous, tubular, longer than the calyx, five-toothed; thoſe of the radius in a ſimple ſeries, ligulate, wedge-shaped, obtuſe, flat, three-cleft almoſt half way down, twice as long as the calyx. *Stam.* in the tubular florets, Filaments five, capillary, ſhort; anthers acute, united into a prominent tube. *Piſt.* in the ſame, Germen oblong, downy; ſtyle thread-shaped, nearly as long as the ſtamens; ſtigmas two, capitate, divaricated between the points of the anthers. In the ligulate florets, ſtyle very ſhort. *Peric.* none. *Seeds* in each floret ſolitary, oblong, hairy, crowned with ſeveral membranous long-awned ſcales. *Recept.* convex, naked.

Eſſ. Ch. Receptacle naked. Seed-down of ſeveral chaffy, pointed, awned ſcales. Calyx of many equal leaves.

1. *A. heterophylla*. Various-leaved Sun-wort. Willd. n. 1. Juff. as above, t. 61. f. 2.—Gathered by Commerſon at Monte Video. The ſtem is ſhrubby, angular, furrowed; the branches leafy, downy when young, ſingle-flowered. *Leaves* alternate, ſeſſile, linear-oblong, an inch or two in length, rather fleſhy, ſlightly downy on both ſides, blunt, with a ſmall point; the lower ones generally furniſhed with a ſtrong tooth at each ſide; the upper ſmaller, narrower and entire. *Flowers* ſolitary, on long, naked, downy ſtalks, at the end of each branch, erect, an inch in diameter. *Calyx* downy. *Radius* ſhort, yellow. *Diſk* broad, convex, darker coloured; the *ſlorets* numerous, externally hairy in their upper part. Awns of the *ſeed-down* reddiſh, as long as the partial corolla.

This plant appears to us very nearly related to HELENIUM, (ſee that article,) into which genus it might, without any violence to nature, have been introduced. Even the *calyx* ſcarcely betrays a difference, for that of *Helenium* can hardly be conſidered as of one leaf, any more than thoſe of *Helianthus*, *Rudbeckia*, &c. The ſtructure of the *radius*, downineſs of the *ſeeds* and of the tubular *ſlorets*, pointed chaffy *ſeed-crown*, all agree. We have not indeed ſeen the deſcription given by the learned author of this genus, nor will our ſpecimen admit of an investigation of the more recondite parts of fructification, without injury to ſo great a rarity; but we ſhould not ſcruple to ſink *Alinea* in *Helenium*, according to our preſent means of judging.

ACTINELLA, a diminutive of ACTINEA, (ſee that article,) and therefore inadmiſſible, as being contrary to one of the foundeſt laws of nomenclature. Nor is this genus, probably, any more than *Alinea*, diſtinct from *Helenium*, next to which *Alinea* is placed by Purſh, Fl. Amer. Sept. 494. 560, who deſcribes it as follows, citing Perſ. Syn. v. 2. 469, and, as a ſynonym, *Alinea*, Juff. in Ann. du Muf. v. 2. 425.—Clafs and order, *Syngenefia Polygamia-fuperflua*.

Eſſ. Ch. Receptacle naked. Seed-crown of from four to fix chaffy-awned ſcales. Calyx of many equal leaves.

1. *A. lanata*.—Clothed all over with woolly down. *Leaves* linear; pinnatifid upwards. *Stalks* elongated, ſingle-flowered. *Radiant florets* with two teeth. *Seeds* five-sided, ſmooth.—Found by Governor Lewis, on the high lands of the Kookkoolky. Perennial, flowering in June and July. The whole *herb* is clothed with white woolly down. *Stem* branched, round. *Branches* alternate, ſubdivided in the upper part; their ultimate diviſions ſingle-flowered. *Leaves*

of the main ſtem alternate, linear, dilated and pinnatifid upwards, toothed; thoſe of the branches linear, undivided. *Flower-ſtalks* terminal, ſwelling towards the end. *Flowers* orange-coloured, the ſize of *Tagetes erecta*. *Calyx* oblong, ſimple, of from twelve to fourteen linear-lanceolate acute leaves. *Florets* of the *radius* from twelve to fourteen, oblong, ribbed, each with two teeth; thoſe of the *diſk* tubular, of the ſame colour. *Down* of from four to fix whitith, acute, chaffy ſcales, occaſionally torn. *Seeds* oblong, prismatic, with five angles. It reſembles in habit Juffieu's *Alinea* in Ann. du Muf. v. 2. t. 61. f. 2. *Purſh*.

We are entirely at a loſs to account for the change in the generic name, if the genera are ſuppoſed the ſame, and it ſeems fortunate that both are likely to be ſunk in *Helenium*.

ACTINOCARPUS, from *actis*, a ray, and *καρπος*, fruit, alluding to the radiating poſition and form of the capſules. Mr. Brown was obliged to invent this very expreſſive name for the *Damaſonium* of Juffieu, becauſe the latter appellation has been adopted for another genus, in the works of Schreber and Willdenow.—Brown Prodr. Nov. Holl. v. 1. 342. (*Damaſonium*; Juff. Gen. 46. Tourn. t. 132.)—Clafs and order, *Hexandria Hexagynia*. Nat. Ord. *Tripetaloides*, Linn. *Junci*, Juff. *Alyſſacea*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of three ovate, concave, permanent leaves. *Cor.* Petals three, roundiſh, flat, ſpreading, larger than the calyx, deciduous. *Stam.* Filaments ſix, awl-shaped, ſhorter than the corolla; anthers roundiſh. *Piſt.* Germens ſix or eight, erect, combined at the baſe; ſtyles ſhort, ſpreading; ſtigmas ſimple. *Peric.* Capſules as many, combined at the baſe, ſpreading in the form of a ſtar, compressed, pointed, of one cell, burſting at the upper edge. *Seeds* two, elliptical, ſtalked, one erect, inſerted into the bottom of the capſule, the other at its curve, horizontal.

Eſſ. Ch. Calyx of three leaves. Petals three. Capſules ſix or eight, compressed, combined at the baſe, ſpreading ſtar-wiſe. *Seeds* two.

1. *A. Damafonium*. Great Starry-plantain. (*Alyſſa* *Damaſonium*; Linn. Sp. Pl. 486. Willd. Sp. Pl. v. 2. 277. Sm. Fl. Brit. 401. Engl. Bot. t. 1615. Curt. Lond. faſc. 5. t. 28. Ait. Hort. Kew. v. 2. 332. *Damaſonium ſtellatum*; Dalech. Hiſt. 1058. Tourn. Inſt. 257. Raii Syn. 272. *Plantago aquatica minor ſtellata*; Ger. Em. 417.)—Capſules ſix, burſting lengthwiſe; without wings at the baſe.—Native of watery places on a gravelly ſoil, in England, near London, as well as in Shropſhire, Suffolk, and Suffex. It grows alſo in France and Siberia; flowering in June and July. The *root* is perennial, of many long ſimple fibres, as uſual with aquatic herbs. *Leaves* all radical, floating, ſtalked, elliptic-oblong, ſmooth, two inches long, with a ſtrong mid-rib, and two ſiner ribs, at each ſide, near the margin. *Footſtalks* dilated and winged below. *Flower-ſtalks* one or two, radical, erect, taller than the leaves, round, ſimple, each bearing two or three umbels of whitith *flowers*, giving it a whorled appearance. The *capſules* reſemble thoſe of the *Illicium*, or Starry Anife, in ſize and general figure.

2. *A. minor*. Smaller Starry-plantain. Br. n. 1.—“Capſules eight, burſting tranſverſely; with eight permanent wings at the baſe. Leaves three-ribbed.”—Native of the neighbourhood of Port Jackson, New South Wales, where it was obſerved by Mr. Brown.

We have here admitted this genus, from deference to the authority of Mr. Brown, who eiteems it abundantly different from *Alyſſa*, in the definite number of the *capſules*, their ſituated diſpoſition, their combination at the baſe, and their *two ſeeds*. In the habit of the plants there is no difference.

The Linnæan remark that "there is rarely a genus in which one or other part of the fructification does not prove left constant, or uniform, than the rest," *Phil. Bot. sæ.* 170; a rule too much neglected by founders of new genera in all ages and countries, should teach us caution in every instance, and in the present perhaps might justify keeping the Linnæan *ALISMA* entire. See that article.

ACTINOTUS, so named by M. Labillardiere, *Nov. Holl.* v. 1. 67, from *actinotus*, radiated, alluding to the form of the involucre. See *ERIOCALIA*, which last name is retained by Professor Sprengel, in his *Prodr. Plant. Umbellif.* 27, who gives the following essential character of this very curious genus.

Fruit ovate, villous, with five slender ribs, and crowned by the calyx. Umbel capitate. Involucreum very long, woolly.

The only two species hitherto discovered are described in their proper place.

ACTON, second article, for 853 r. 885. Add, Also, a town of Vermont, in the county of Windham, containing 245 inhabitants.

ACWORTH, l. 3, in 1810, 1523 inhabitants.

ADAIR, in *Geography*, a county in the district of Kentucky, which, with the town of Columbia, has 6011 inhabitants, including 956 slaves.

ADAM, ROBERT. For Kirkaldy, in Fifeshire, r. Edinburgh; and for Edinburgh r. that city.

ADAMAH. For Nephtali r. Naphtali.

ADAMS, in *Geography*, l. 2, r. 1763. At the close, add—Also, a town of New Hampshire, in the county of Coos, containing 244 inhabitants.—Also, a county of Ohio, containing 9434 inhabitants.—Also, a township of Ohio, in the county of Washington, having 620 inhabitants.—Also, a county of Pennsylvania, containing 15,152 inhabitants, of whom 71 are slaves.

ADANSON, MICHAEL, in *Biography*, the article already given requires some correction. This celebrated botanist belonged to a Scottish family, attached to the fortunes of the Pretender. He died of *mollities ossium*, August 3d, 1806, and not before, aged 79 years and 4 months. M. Cuvier, in the *Memoires de l'Institut*, v. 7, has published an elaborate eulogy of Adanson, in which great justice is done to his ardour and acuteness in the pursuit of botany, and to his patience and magnanimity under great sufferings and privations, incident to the political convulsions of his country. The writer of this knew him at Paris in 1786. He was evidently a man of an active and penetrating mind, but devoted to his own imaginations and hypotheses, always attacking, as might be expected, the botanical system of Linnæus, but betraying a weakness unworthy of his own talents, in contemptuously reprobating the whole principles and performances of the illustrious Swede. Yet we are possessed of two letters from Adanson to Linnæus, both amicable and complimentary in the highest degree. In the first, dated June 28, 1754, the writer offers to communicate his discoveries and remarks made at Senegal, speaks of Gum *Bdellium* as the *Thus*, or Frankincense, of Europeans, used for fumigation in churches, and exhorts Linnæus to continue to illustrate botanical science. The second, dated October 2, 1758, acknowledges the receipt of a most welcome letter from Linnæus; laments the recent death of Anthony de Jussieu, and the illness of Bernard de Jussieu, which obliged Adanson to undertake the department of herborizing with the students. He subjoins an account of the African tree Baobab, which Bernard de Jussieu had named *Adanonia*, and gives its natural generic character at length, professedly in the Linnæan manner, with several articles of information which

Linnæus afterwards introduced into his account of *Adanonia*. This letter moreover contains some matters relating to Zoology; mentions the great want of accuracy in the characters of almost all the exotic genera of plants, described by travellers, which the writer had examined at Senegal, and concludes with most respectfully thanking Linnæus for his promise to make Adanson a member of the Upsal Academy of Sciences. This promise appears never to have been fulfilled. It might well be dispensed with when Adanson, in the following year, read before the *Academie des Sciences*, at Paris, that history of botany, which now makes a part of the preface of his work, entitled *Familles des Plantes*, published in 1763. In this the system of Tournefort is exalted above the natural as well as artificial methods of Linnæus, and the person whose correspondence he had been courting, and to whose "favour and friendship" he had so lately recommended himself, is depreciated in the most contemptuous manner, in almost every thing he had done for the science of botany. This has been attributed to the correspondence of Adanson being slighted by Linnæus; but there was hardly time for such a consequence. He rather appears to have found it expedient and popular to attack the fame of the great naturalist, to whose merit the French were then becoming sensible, and who threatened to eclipse the honours so long enjoyed by Tournefort. Notwithstanding Tournefort's merits, Adanson tells us, p. 154, that "he has reason to think his own *Familles* will be adopted, as containing the sum of all the knowledge acquired in the science of botany." An author seldom errs more than when he prophesies the success of his own works. Had Adanson foretold that his performances would never be refuted, he had been right, for they have slept in almost total neglect. We have given a sufficient account of his method and nomenclature, under the head of **NATURAL ORDERS**. We are aware that it is still popular at Paris to commend him, nor would we deprive him of any praise which he can enjoy, without injustice to his predecessors, or without his authority leading to scientific error, and historical mistake.

ADDISON, JOSEPH, l. 2, r. Ambrosbury for Abrosbury.

ADDISON, County, l. 5, contained, in 1810, 19,998 inhabitants, dispersed in 24 townships.

ADDISON, l. 4, for 401 r. 1100. Add—Also, a town of Washington county, in the district of Maine, containing 399 inhabitants.—Also, a township of Pennsylvania, in the county of Somerset, having 678 inhabitants.

ADENANTHOS, in *Botany*, so named by Labillardiere, from *aden*, a gland, and *antos*, a flower, on account of the glands, in the form of scales, attached to the permanent base of the corolla.—Labill. *Nov. Holl.* v. 1. 28. Brown-Tr. of Linn. Soc. v. 10. 151. *Prodr. Nov. Holl.* v. 1. 367.—Clafs and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceæ*, Juss. Brown.

Gen. Ch. *Cal.* Involucreum single-flowered, of from four to eight short, imbricated leaves. *Cor.* of one petal, inferior, tubular, cut round near the base, and from above that part deciduous; its limb in four deep, lanceolate, flat segments, turned to one side. Nectary four glands, united with the permanent base of the corolla at its inflexure. *Stam.* Filaments four, short, inserted into the disk of each segment of the corolla; anthers oblong, erect. *Pist.* Germen superior, roundish; style thread-shaped, longer than the corolla; stigma vertical, awl-shaped, rather thicker than the style. *Nut.* Nut tumid, of one cell, with a single seed.

Eff. Ch. Involucreum imbricated, single-flowered. Corolla four-cleft, splitting circularly near the base. Nectary four glands, attached to the bottom of the corolla. Style longer

longer than the corolla. Stigma vertical, awl-shaped. Nut tumid.

A shrubby New Holland genus. *Leaves* scattered, various in the different species. *Flowers* axillary, solitary, reddish; rarely terminal, somewhat aggregate, and yellowish. *Brown*.

1. *A. obovata*. Obovate-leaved Adenanthos. Labill. Nov. Holl. v. 1. 29. t. 37. Brown n. 1.—Leaves obovate, entire, smooth.—Observed by M. Labillardiere, as well as by Mr. Brown, on fony hills in Lewin's land, on the fourth coast of New Holland. *Branches* round, thickly clothed with coriaceous *leaves*, near an inch long, broadly obovate, triple-ribbed, besprinkled with blackish glandular dots; their lateral ribs fending off veins towards the margin. *Flowers* axillary, solitary, twice as long as the leaves. *Involucrum* of six or eight smooth scales. Points of the corolla scarcely hairy on the inner side. *Style* hairy, except at the top and bottom. *Stigma* rather swelling. *Labill*.

2. *A. cuneata*. Wedge-leaved Adenanthos. Labill. Nov. Holl. v. 1. 28. t. 36. Brown n. 2.—Leaves wedge-shaped, silky; bluntly toothed at the extremity.—Gathered near the sea-coast at Lewin's land, by Brown and Labillardiere. We have a specimen from the latter. This *Stibr* is about the height of a man. *Leaves* hardly an inch long, erect, stalked, silky and silvery on both sides, with three principal ribs, sometimes combined at the lower part; their abrupt extremity unequally and bluntly notched. *Flowers* towards the tops of the branches, axillary, stalked. *Involucrum* fringed, silky, as well as the outside of the corolla, whose segments are densely bearded on the inside. *Style* swelling and hairy in the middle.

3. *A. sericea*. Silky-leaved Adenanthos. Labill. Nov. Holl. v. 1. 29. t. 38. Brown n. 3.—Leaves thread-shaped, twice-ternate, silky. *Flowers* axillary, solitary. *Style* smooth.—Native of the sandy sea-coast of Lewin's land, where it was found by the authors cited. Our specimen was gathered by Mr. Menzies, at King George's found, on the west coast of New Holland. The *branches* are round and silky, the younger ones most densely leafy. *Leaves* about an inch and a half long, twice or thrice deeply three-cleft, in narrow blunt, thread-shaped segments, clothed with silky hairs. *Flowers* towards the tops of the branches, densely hairy, rather longer than the leaves. *Style* smooth in every part, rather swelling in the middle.

4. *A. terminalis*. Terminal-flowered Adenanthos. Brown n. 4.—Leaves thread-shaped, three-cleft; their lateral segments cleft; middle one undivided. *Flowers* terminal, solitary or three together. *Style* shaggy.—Gathered by Mr. Brown, at Flinder's land, on the fourth coast of New Holland, in low ground near the sea-coast.

ADENODUS, so called by Loureiro, from *adnu*, a gland, because of the glands of the flower, which remain to accompany the fruit.—Loureir. Cochinch. 294.—Class and order, *Dodecandria Monogynia*.

Gen. Ch. *Cal.* Perianth inferior, of five lanceolate, reflexed, deciduous leaves. *Cor.* Petals five, ovate, nearly erect, the length of the calyx, divided half way down into many thread-shaped segments. Nectary five large, depressed, permanent, two-lobed glands. *Stam.* Filaments fifteen, short, spreading, inserted into the receptacle; anthers oblong, quadrangular, erect, split and reflexed at the summit. *Pist.* Germen superior, elongated; style awl-shaped, the length of the stamens; stigma acute. *Peric.* Drupa obovate-oblong, small, smooth, single-seeded. *Seed.* Nut oblong, rugged.

Eff. Ch. Calyx five-leaved, inferior. Petals five, fringed.

Nectariferous glands two-lobed, permanent. Drupa with a single seed.

1. *A. sylvestris*. Cây Côm trắng, of the Cochinchinese.—Native of woods in Cochinchina. A middle-sized tree, with spreading branches. *Leaves* alternate, ovato-lanceolate, ferrated, smooth. *Spikes* nearly terminal. *Flowers* variegated with red and white. *Loureiro*.

De Theis, *Glossaire de Botanique*, 6, has anticipated us in the remark, that this plant approaches the genus *ELÆOCARPUS*. (See that article.) Indeed we have scarcely a doubt of its being one of that genus, though, having few no specimen, we cannot absolutely assert this point. Still less can we determine whether Loureiro's plant be any of the species already known.

ADENOSMA, a word composed of *adnu*, a gland, and *osmu*, a scent, which expresses the glandular and fragrant nature of the herbage.—Brown Prodr. Nov. Holl. v. 1. 442.—Class and order, *Didymia Angiosperma*. Nat. Ord. *Perfonate*, Linn. *Scrophularia*, Juss. *Scrophularine*, Brown.

Eff. Ch. Calyx in five deep segments; the upper one largest. Corolla ringent; upper lip undivided, lower in three equal lobes. Anthers approaching each other. Stigma dilated. Capsule ovate, beaked, separable into two parts. Receptacles united to the futures.

1. *A. cerulea*. Blue Adenosma. Br. n. 1.—Gathered by Sir Joseph Banks, and Dr. Solander, in the tropical region of New Holland. Seen by Mr. Brown in a dry itate only. An annual downy herb, besprinkled with glands, and smelling like mint, turning black in drying. The spike is leafy; or the flowers may be termed axillary. Calyx rough with jointed hairs, and accompanied by a pair of bractes. Corolla blue. *Brown*.

This author remarks, that *Ruellia uliginosa* and *balsamea* constitute a genus nearly akin to the present, and that both are related to the order of *Acanthi*, or *Acanthaceae*, but especially *Adenosma*, on account of its beaked capsule.

ADENOSTEMMA, Forst. Gen. t. 45. See LAVENIA.

ADEODATUS, POPE, in *Biography*, denominated "Dieu donné," God's Gift, was by birth a Roman, and by profession a monk. He became pope in 672, and died in 676.

ADEPS. Subjoin, See CELLULAR Substance.

ADERME, in Commerce. See QUINTAL.

ADIANTUM, in Botany, an ancient Latin name, which by Pliny's account, book 22. chap. 21, appears to have belonged to the very species of fern, *Adiantum Capillus-Veneris*, to which it is still applied. But that account, like half his work, as we have it, is a manifest jumble of various ill-assorted materials. What he hints there, as well as in the beginning of the 17th chapter of his 21st book, relative to the permanency of the leaves, whether originally reported of the same plant, or of some other, is not contrary to truth, inasmuch as this fern is almost always verdant. His derivation of the name, from *ad*, without, or contrary to, and *diuina*, to moisten, because water trickles off the leaves without wetting them, may satisfy us, for want of a better; but how much better would such an explanation suit any glaucous herb, like the cabbage.—Linn. Gen. 560. Schreb. 757. Willd. Sp. Pl. v. 5. 427. Mart. Mill. Dict. v. 1. Swartz Syn. Fl. Pl. c. Sm. Fl. Brit. 1138. Prodr. Fl. Græc. Sibth. v. 2. 278. Brown Prodr. Nov. Holl. v. 1. 155. Ait. Hort. Kew. v. 5. 524. Pursh 670. Juss. 15. Tourn. t. 317. Lamarck Dict. v. 1. 40. Illustr. t. 870.—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices doctifere*, annulate.

ADIANTUM.

Eff. Ch. Masses of capsules oblong, or roundish, inserted into each marginal, reflexed, limited involucrem.

Such is the character of the original *Adiantum* of all authors, a numerous genus, from which Dr. Swartz has first distinguished his *CHEILANTHES*, to be treated of hereafter in its proper place, whose character is, that the masses of capsules are really placed on the margin of the leaf itself, each being covered only by its respective involucrem. The difference is nice, and escaped every previous observer, but we believe it to be a very found one, inasmuch as it is attended by a difference of habit, and the involucrem of *Cheilanthes* is not always necessarily interrupted, though the masses of capsules, *forti*, are distinct.

In our former article, (see *ADIANTUM*,) forty-six species are briefly enumerated, with a particular account of two, which need not here be repeated. As the genus now stands, Willdenow has fifty-four, (besides nineteen of *Cheilanthes*,) disposed in sections, of which we shall give examples, with additions of new species.

SECT. 1. *Fronde simplici.* Three species in Willdenow.

1, *A. reniforme*, Linn. Sp. Pl. 1556; 2, *ajacifolium* of Willdenow, Lamarck f. 2; and 3, *philippense*, Linn. Sp. Pl. 1556. We have none to add. For *A. sagittatum*, see LINDSÆA.

SECT. 2. *Fronde ternate.*

4, *A. triphyllum* only. Sm. Plant. Ic. t. 74.

SECT. 3. *Fronde pinnate.* Twelve species in Willdenow.

5, *A. macrophyllum*, Swartz Ind. Occ. 1707; 6, *obliquum*, Willd.; 7, *lunulatum*, Willd. Phytog. t. 9. f. 1; 8, *arcuatum*, Sw.; 9, *pumilum*, Sw. Pluk. Phyt. t. 251. f. 4; 10, *caudatum*, Linn. Mant. 308; 11, *hirsutum*, Willd. from the island of Mauritius; 12, *rhizophorum*, Sw. Syn. 320, from the same country. We have two to add.

A. platyphyllum. Broad-leaved Maidenhair. Swartz in Stockh. Transf. for 1817. 74. t. 3. f. 6.—Fronde pinnate; leaflets stalked, ovate, taper-pointed, nearly entire; oblique, and dilated upwards, at the base; glaucous beneath. Dots oblong, contiguous along the whole margin.—Native of shady woods in Brasil. *Freyeria*. A foot high, or more, consisting of from three to six alternate leaflets, two inches long and one broad, with numerous divaricating veins; the barren ones very inconspicuously serrated. Common stalk smooth, of a shining black. The insertion of the capsules is by no means well explained, either in the figure or description.

A. paradoxum. Ambiguous Maidenhair. Br. n. 1.—“Fronde pinnate; leaflets heart-shaped, oblong-ovate, or lanceolate; their veins underneath obsolete. Dots linear, uninterrupted.”—Gathered by Mr. Brown, near Port Jackson, New South Wales.

SECT. 4. *Fronde partly bipinnate.* Five species.

13, *A. deltoideum*, Sw. Ind. Occ. 1705; 14, *denticulatum*, ibid. 1711; 15, *salcatum*, ibid. 1715; 16, *varium*, Willd., found by Humboldt and Bonpland, near Caripe, in South America; 17, *ferrulatum*, Linn. Sp. Pl. 1557.

SECT. 5. *Fronde three-branched, digitate, or pedate; the branches pinnate.* Seven species.

18, *A. ternatum*, Willd., found near Caripe, in South America, by Humboldt and Bonpland; 19, *radiatum*, Linn. Sp. Pl. 1556; 20, *pedatum*, ibid. 1557, see our former article; 21, *Lindleea*, Cavan. Leccion. 271, gathered by Louis Née, at Quito; 22, *patens*, Willd., found by Bredemeyer at the Caracacs; 23, *pubescens*, Willd., which is *pedatum* of Forst. Prodr. 83; 24, *stellulatum*, Linn. Sp. Pl. 1557. This last is unquestionably *A. fuscum*, Retz. Obf. fasc. 2. 28. t. 5, the figure of which precisely answers to the Linnæan specimen of *stellulatum*,

except that the upper sides of the branches in the latter are clothed with fine short rusty down, like velvet, which might escape the notice of professor Retzius. The common stalk, except at the very top, is quite smooth and naked, as described by him.

SECT. 6. *Fronde twice, thrice, or four times, pinnate.* Thirty species.

25, *A. Lancaea*, Linn. Sp. Pl. 1557; 26, *friatum*, Sw. Ind. Occ. 1717. Jacq. Ic. Rar. t. 646; 27, *tetraphyllum*, Willd., found by Humboldt and Bonpland near Caripe; 28, *polium*, Willdenow, found by the same at Cumana; 29, *pyramidale*, Willd., which is *Polypodium pyramidale*, Linn. Sp. Pl. 1554. This is *Filix ramo pyramidalis, pinnis parvis*, Petiv. Fil. n. 40. t. 4. f. 12, not f. 2. Linnæus adopted this species entirely from Petiver's figure, and was thus led to make it a *Polypodium*. But that figure is copied from *Lonchitis ramosa tenuis, pediculis spinosis*, Plum. Fil. 42. t. 54, where the characters and habit of an *Adiantum* are conspicuous; 30, *melanoleucum*, Willd., adopted by this author, without seeing a specimen, from *Adiantum lunulis albicanibus signatum*, Plum. Fil. 79. t. 96; 31, *cristatum*, Linn. Sp. Pl. 1558; 32, *nerosum*, Swartz Syn. 123. (see *bispidalum*, Br. n. 2, at the end of this section); 33, *bispidalum*, Swartz Syn. 124 and 321, suspected by Mr. Brown to be the same as n. 32; 34, *villosum*, Linn. Sp. Pl. 1558; 35, *monosporatum*, Willd., gathered at the Caracacs by Bredemeyer; 36, *ferrato-dentatum*, Willd., found by Humboldt and Bonpland near Caripe, and in Brasil; 37, *crenatum*, Willd., taken up entirely from *Lonchitis ramosa, rotundè crenata*, Plum. Fil. 41. t. 53; 38, *pulverulentum*, Linn. Sp. Pl. 1559; 39, *umbrosum*, Willd., found by Bredemeyer, in shady situations at the Caracacs; 40, *trapeziforme*, Linn. Sp. Pl. 1559, a West Indian fern, strangely supposed to grow in Scotland, because Sibbald's rude figure of a variety of *Applenium marianum* was taken for it; see Sm. Fl. Brit. 1128; 41, *pentadactylon*, Langsdorff and Fischer, Ic. Fil. t. 25, found in Brasil; 42, *affine*, Willd., which is *trapeziforme* of Forst. Prodr. 84. “Schkuhr Crypt. t. 121. b;” 43, *Capillus Veneris*, Linn. Sp. Pl. 1558. Fl. Brit. 1138. Engl. Bot. t. 1564, see our former article; 44, *emarginatum*, Willd., found by Bory de St. Vincent, on rocky margins of torrents in the isle of Bourbon; 45, *cuneatum*, Langsdorff and Fischer, Ic. Fil. t. 26, found in Brasil; 46, *tenerum*, Swartz Ind. Occ. 1719; 47, *fragile*, ibid. 1721; 48, *concinnum*, Willd., which is *tenerum*, Schkuhr Crypt. t. 121, (but not of other authors,) gathered by Humboldt and Bonpland in the Caracacs; 49, *sumarioides*, Willd., communicated by Flügge, from the isle of Bourbon; 50, *ethiopicum*, Linn. Sp. Pl. 1560; 51, *trigonum*, Labill. Nov. Holl. v. 2. 99. t. 248. f. 2, considered by Mr. Brown as not different from the following; 52, *affinile*, Swartz Syn. 125 and 322. t. 3. f. 4; 53, *pellens*, Swartz Syn. 125 and 323, figured in Pluk. Phyt. t. 403. f. 2; 54, *polyphyllum*, Willd., found at the Caracacs by Bredemeyer. We subjoin the following.

A. bispidalum. Roughish New Holland Maidenhair. Br. n. 2. Swartz Syn. 124? See n. 33, above. (*A. nervosum*; Swartz Syn. 123? See n. 32, above. *A. pedatum*; Forst. Prodr. 83, on the authority of his herbarium.)—Fronde doubly pinnate; lowest branches divided; leaflets ovate-rhomboid, toothed in front, striated, rather hairy, and rough. Involucrem nearly orbicular, hairy. Common stalk and ribs rough.—Gathered by Dr. White, as well as by Mr. Brown, in New South Wales, and by the latter in the tropical part of New Holland. A foot high, or more, with a strong tufted root, whose crown is scaly. Stalks purplish-black, harsh. Leaflets somewhat stalked,

stalked, numerous on each long partial *branch*, crowded, oblique, jagged, half an inch in length, of a fine green. *Involucrum* crowded most about the inner, or upper, angle of the base, brown, round or kidney-shaped, rough with fine bristly hairs; their under side covered with little brown crowded *capsules*, which are quite unconnected with the leaf.

A. formosum. Elegant New Holland Maidenhair. Br. n. 3.—“Frond repeatedly compound, deltoid; branches triply pinnate; leaflets rhomboid, obtuse, smooth; the lower ones cut. *Involucrum* kidney-shaped. Partial ribs downy. Common stalk rough.”—Discovered by Mr. Brown, near Port Jackson, New South Wales. We know not that we have ever seen a specimen.

A. affinis. Rounded New Holland Maidenhair. Br. n. 4. Swartz Syn. 125 and 322. t. 3. f. 4. (*A. trigonum*; Labill. Nov. Holl. v. 2. 99. t. 248. f. 2; see n. 51 and 52 above.)—Frond repeatedly compound, very smooth; leaflets roundish-rhomboid, deeply notched in front; the notches contracted, each bearing a smooth kidney-shaped *involucrum*. Common stalk and ribs perfectly smooth.—Gathered by Dr. White and Mr. Brown, in the neighbourhood of Port Jackson, and by the latter, as well as M. Labillardiere, on the fourth coast of New Holland, and in Van Diemen’s island. From one to two feet high, composed of numerous little, fan-like, stalked, ribbed, bright-green leaflets, between whose rounded marginal segments the smooth, light-brown *involucrum*s are stationed. These by age become reflexed, and turn up the numerous pale *capsules* which cover their under surface.

A. subcordatum. Heart-leaved Maidenhair. Swartz in Stockh. Transf. for 1817. 75.—“Frond triply pinnate; leaflets stalked, somewhat heart-shaped, pointed, slightly crenate, with radiating veins. *Involucrum*s at each margin, roundish-crescent-shaped.”—Gathered by Mr. Freyreis, in shady woods in Brasil. *Common stalk* round, dark purple, smooth and polished. *Frond* eighteen inches long, its outline ovate, or deltoid. Primary and secondary *branches* alternate, widely spreading, straight, round, smooth, the colour of the stalk. *Leaflets* alternate, rather distant, some regular, others oblique and dilated at the upper angle of the base, an inch in length, with a long point to each; smooth on both sides; streaked beneath with copious, forked, radiating veins, and slightly glaucous; the margin obscurely serrated. *Common rib* slightly zigzag, polished. *Dots* at the upper and under edges, not at the base or apex, roundish, distinct, covered by brown crescent-shaped *involucrum*s. Swartz. This mode of expression must not be taken literally, for then the plant would be a *Cheilanthes*. The author adds, that this species is very distinct in the shape of its leaflets; for so only can we understand “*forma pinnarum*,” as meaning *pinnularum*.

A. intermedium. Intermediate Maidenhair. Swartz in Stockh. Transf. for 1817. 76.—“Frond doubly pinnate; leaflets halved, wedge-shaped, oblong-rhomboid, obtuse, ribbed and striated; with a right angle at the upper side of the base; serrated and fructifying at the front and apex. Stalk and ribs rough and downy.”—Gathered by Mr. Freyreis in low woods, in the interior part of Brasil, in September. *Root* creeping. *Common stalks* a foot high, triangular, rigid, roughish, brownish-black, beset with rusty hair. *Fronde* half as long, deltoid: first divisions opposite, linear-lanceolate, curved upwards, of three pair of leaflets, half an inch in length, besides an odd one rather longer, all somewhat stalked, slightly falcate, obtuse, crowded, smooth on both sides, of a brownish-green.

Dots four or five, distinct, each with a semicircular, curved, brown *involucrum*. Intermediate, as it were, between *crifatum* of Linnaeus, and *nervojum* of Swartz, n. 31 and 32, but differing from the former in having the *common stalk* not rough with prominent points, nor the lower *branches* deeply divided; from the latter in having wedge-shaped leaflets, somewhat falcate in front, and other particulars. It is perhaps too nearly related to *A. acuminatum* of Deveaux. Swartz.

ADJUSING. See BUNDELA and REWAH.

ADIPOCIRE, in *Chemistry*, is described at length in the Cyclopædia; but the curious fact that this substance forms a principal ingredient in some species of BILIARY Calculi has been omitted under both articles.

ADJUSTMENT, the settling of the averages or losses on policies of assurance. See AVERAGE.

ADONIS, in *Botany*, was so named in memory of the favourite of Venus, reported by the poets to have been changed, by that goddess, into a flower. But whether ours is the very plant, known by this name to the ancients, would be almost as difficult to prove as the original fact. Our former article requires correction, in consequence of the publication of De Candolle, by which we have profited so much in ACONITUM, ACTÆA, &c.—De Cand. Syst. v. 1. 220. Linn. Gen. 281. Schreb. 377. Willd. Sp. Pl. v. 2. 1303. Mart. Mill. Dict. v. 1. Sm. Fl. Brit. 586. Prodr. Fl. Græc. Sibth. v. 1. 379. Ait. Hort. Kew. v. 3. 350. Juss. 232. Lamarck Illustr. t. 498. Gærtn. t. 74.—Class and order, Polyandria Polygynia. Nat. Ord. Multiflorique, Linn. Ranunculaceæ, Juss. De Cand.

Gen. Ch. Cal. Perianth inferior, of five obtuse, concave, close-pressed, somewhat coloured, deciduous leaves, sometimes with a small spur at the base. Cor. Petals from five to fifteen, oblong, obtuse, polished, with simple naked claws. Stam. Filaments numerous, very short, awl-shaped, inserted into the base of the receptacle; anthers oblong, inflexed. Pist. Germens numerous, ovate, inserted into the oblong-conical receptacle, crowded, above the stamens, each pointed with a very short, partly decurrent, style; stigmas acute, reflexed. Peric. none. Recept. oblong, spiked. Seeds numerous, irregular, angular; gibbous at the base; reflexed at the point, rather prominent, without awn or wing.

Ess. Ch. Calyx of five leaves. Petals from five to fifteen, destitute of nectaries. Seeds naked.

Herbaceous plants, with leafy stems. Leaves deeply cut, in a pinnate manner, their lobes many-cleft, in very numerous, linear segments. *Involucrum* none. Flowers solitary, at the summits of the stem, or branches, yellow, scarlet or crimson, never blue.

All the ten species are found in Europe, or in the adjoining countries of northern Africa and Asia; those of the first section in cultivated plains; of the second in rugged mountainous spots.

The perennial kinds have acrid, bitterish, purgative roots, capable of supplying the place of Hellebore. The annual ones are almost inactive.

The genus is divisible into two sections, by the habit and duration, confirmed by differences in the flowers and fruit, as follows.

Secf. 1. *Adonia*. De Candolle.

Adonis of C. Bauh. Pin. 178.

Petals from five to ten, concave or flat. Stam. eighteen or twenty. Seeds collected into an ovate or cylindrical spike, always smooth, each beaked with a straight conical style. Roots pale, annual, tapering, but little divided. All these annual ones are so nearly akin, that they have been taken by several

ADONIS.

several authors, perhaps not improperly, for varieties of one species. The following synonyms therefore are equally applicable to all of them.

Adonis. Matth. Valgr. v. 2. 257.

Flos Adonis, alius Eranthemum. Bauh. Hist. v. 3. p. 1. 125, 126.

Adonis radice anna. Linn. Hort. Cliff. 231, not 321. Sauv. Monip. 253.

A. annua. Lamarck Dict. v. 1. 45. Brot. Lufit. v. 2. 376. *A. n.* 1158. Hall. Hist. v. 2. 66.

The following plants may, in M. De Candolle's opinion, be esteemed, with equal propriety, either species or varieties. He therefore proposes them with hesitation, recommending them to the observation of practical botanists. Whatever difficulties may attend some of these, we are persuaded that they cannot all be united, even though the *autumnalis* and *asivialis* should prove the only two that are permanently distinct, and the foundations of all the rest.

1. *A. autumnalis.* Corn Adonis, or Pheasant's-eye. Linn. Sp. Pl. 771. De Cand. n. 1. Willd. n. 2. Sm. Prodr. Fl. Græc. Sibth. n. 1263. Fl. Brit. n. 1. Engl. Bot. t. 308. Curt. Lond. falc. 2. t. 37. (*Flos Adonis*; Cluf. Hist. v. 1. 336. Raii Syn. 251. Park. Parad. 293. f. 5. Ger. Em. 387. Lob. Ic. 283. Adonis; Camer. Epit. 647. A. hortenais, flore minore aratorubente; Morif. sect. 6. t. 8. f. 1. Eranthemum flore rubro; Bell. Eyst. ætiv. ord. 5. t. 11. f. 2.)—Calyx smooth. Petals concave, converging, scarcely larger than the calyx. Seeds somewhat reticulated, collected into an ovate head. Stem branched.—Native of corn-fields in various parts of Europe, from Germany to Greece, flowering through the summer to the end of autumn; not frequent in England, except in gardens, where it is often cultivated amongst other hardy annuals, and as De Candolle observes, prefers itself unaltered from seed. The root is somewhat spindle-shaped. Stem branched, bushy, round, striated, occasionally downy. Leaves alternate, dark green, thrice compound, with innumerable, crowded, rather short segments. Calyx pale green; sometimes purplish. Corolla of that peculiar intense crimson, or blood-colour, which gave occasion to the name of Pheasant's-eye, and probably to the original application of the fable to this very plant, whose beauty well merits the compliment. Each petal has a violet-coloured base. Petals inversely heart-shaped, usually about eight. Fruit ovate-oblong, measuring hardly an inch. Calyx-leaves gibbous below their insertion. M. De Candolle remarks, that there is occasionally, though rarely, a paler variety. This seems, by Dr. Withering's specimens, to be what he found on Salisbury plain, and took for *asivialis*. Its petals are rounded, and do not extend beyond the calyx.

2. *A. flava.* Yellow Field Adonis. Villars Cat. Strafb. 247. De Cand. n. 2. (*A. flore pallido*; Camer. Epit. 648. *A. sylvestris, flore citrino*; Tabern. Ic. t. 790." *A. sylvestris, flore luteo, foliis longioribus*; Mill. Ic. t. 14. f. 2? *De Cand.*)—Calyx smooth, with short spurs. Petals flat, oblong, twice the length of the calyx. Seeds nearly smooth, collected into an oblong head. Stem scarcely branched.—Common in corn-fields and vineyards in every part of France, and apparently in Germany also, flowering in June and July. The stem is almost always quite simple. Flowers yellow, or lemon-coloured, rarely pale orange. Calyx-leaves elongated and unattached at the base, almost as in *Sedum* and *Mysurus*. Petals flat, nearly linear. The flowers generally almost rival the size of *A. vernalis*, but there is a variety only half as large; they run into each other. *De Candolle.*

3. *A. micrantha.* Small-flowered Adonis. De Cand.

n. 3.—Calyx smooth; not spurred at the base. Petals flat, oblong, rather longer than the calyx. Seeds somewhat reticulated, collected into an ovate head. Stem somewhat branched.—Found in the south of France, in fields about Toulouse, Avignon, &c., flowering in May and June. A doubtful species. Flower small, yellow, or flame-coloured. Germans few, from seven to ten, composing a very short head. Stem simple at the base, but often a little branched at the summit. *De Candolle.*

4. *A. microcarpa.* Small-fruited Adonis. De Cand. n. 4. (*A. annua, flore minimo, spicâ tenui longissimâ*; Morif. sect. 6. t. 9. f. 4?)—Calyx smooth. Petals flat, oblong, twice the length of the calyx. Seeds reticulated, collected into an oblong head. Stem nearly simple.—Native of corn-fields in Spain, near Tudela; *Dufour*: in the ile of Ivica; *Delaroché*: in Teneriffe; *Broussonet*. Perhaps not distinct from *flava*, n. 2. It appears to differ in the stem not being half so tall, with more crowded foliage. The calyx is scarcely, or not at all, spurred at the base. Seeds about half the size of *flava*, more numerous, and much more reticulated, in a head eight or nine lines long. The corolla is either of a lemon-yellow, or somewhat flame-coloured. *De Candolle.* We take the liberty of introducing Morifon's synonym, which seems to answer best to this species, though applied by De Candolle to the seventh.

5. *A. citrina.* Lemon-coloured Adonis. Hoffm. Germ. v. 1. 251. and n. 1. De Cand. n. 5. (*Ranunculus arvensis, foliis chamæmeli, flore minore luteo*; Tournef. Inst. 291? *De Cand.*)—Calyx hairy at the base. Petals flat, oblong, longer than the calyx. Seeds collected into an ovate-oblong head. Stem nearly simple. Flower almost sessile among the leaves.—Native of corn-fields in France, Germany, Teneriffe, &c. A small plant, with an erect, mostly simple, stem, and little yellow solitary flowers. Base of the calyx rough with hairs. Perhaps the synonyms may rather belong to *microcarpa*, or to *micrantha*. *De Candolle.*

6. *A. flammea.* Flame-coloured Adonis. Jacq. Austr. t. 355. De Cand. n. 6. Willd. n. 3. Ait. n. 3. Hoffm. Syn. 308. Hoffm. Germ. v. 1. 251. (*Eranthemum flore flammeo*; Bell. Eyst. ætiv. ord. 5. t. 11. f. 3?)—Calyx hairy at the base. Petals flat, oblong, somewhat acute, longer than the calyx. Seeds collected into a cylindrical head. Stem branched. Flowers stalked.—Native of corn-fields in Austria, flowering in summer; *Jacquin*. In Brunswick; *Hoffmann*. The stem is two feet or more in height, branched from the bottom all the way up, furrowed, smooth or hairy. Footstalks hairy. Leaves light-green, with lanceolate segments. Flowers large, on long stalks. Calyx acute, jagged, reddish. Petals eight or nine lines in length, somewhat obovate, but more or less acute, and frequently toothed; their colour orange-scarlet.

7. *A. asivialis.* Tall Scarlet Adonis. Linn. Sp. Pl. 771. De Cand. n. 7. Sm. Fl. Brit. 587, note. Tour on the Continent ed. 2. v. 3. 16. Prodr. Fl. Græc. Sibth. n. 1262. (*A. miniata*; Jacq. Austr. t. 354. Hoffm. Germ. v. 1. 251. *A. annua, flore majore phœniceo*; Morif. sect. 6. t. 9. f. 3. *A. sylvestris, flore phœniceo*; Bauh. Pin. 178. *Anemone tenuifolia*; Cord. Annot. 151, good.)—Calyx hairy at the base. Petals flat, oblong, obtuse, twice the length of the calyx. Seeds reticulated, collected into a long cylindrical spike. Stem slightly branched. Abundant in corn-fields of the south of Europe, France, Italy, &c.; frequent in Greece, according to Dr. Sibthorp, who from that circumstance, and its coincidence with a figure in the famous old manuscript copy of Dioscorides, at Vienna, was led to consider this species as the *zygionum* of that ancient botanist.

This

This *Adonis* is one of the tallest, with a copiously-branched, furrowed stem; light-green leaves; and long-stalked flowers, which we cannot, with De Candolle, term small ones, being, as far as we have seen, of the full size of any annual species of its genus. The petals are usually numerous, of a moist vivid scarlet. Fruit long, but not interrupted, except by accident. We cannot but confide our friend M. De Candolle as having cited Morison, on the present occasion, with less accuracy than usual, and we have made an alteration herein; see species 4th.

8. *A. dentata*. Toothed-seeded *Adonis*. "Delile Egypt. 17. Desfer. t. 53. f. 1." De Cand. n. 8.—"Calyx hairy at the base. Petals flat, oval-oblong, rather longer than the calyx. Seeds reticulated; tuberculated and toothed at the base; disposed in a long uninterrupted spike."—Native of corn-fields and barren ground, in Egypt and Cyprus; as well as in Provence, between Digne and Colmars. The stem is angular and striated, firm, branched. Flowers on short stalks. In the Egyptian specimens, the petals are oval, yellow, with blackish claws; seeds furnished at the base with tooth-like prickles, finely corrugated, less crested at the back, and disposed in a slender spike. In the Provence variety, the petals are oblong, and flame-coloured; seeds less toothed or tuberculated at the base, more crowded, lying over each other with their crests, so as to form a continued spike an inch long. De Candolle.

Seet. 2. *Confligo*. Matthioli, De Candolle.

Petals from eight to fifteen, always oblong, flat. Stamens from 25 to 30. Seeds, collected into an ovate head, each ovate, beaked with its hooked recurved style. Roots perennial, thick at the crown, blackish, with clustered fibres.

9. *A. vernalis*. Spring *Adonis*. Linn. Sp. Pl. 771. De Cand. n. 9. Willd. n. 4. Ait. n. 4. Curt. Mag. t. 134. Lamarck f. 3. (*A. apennina*; Jac. Austr. t. 44. *Elleborus niger verus*; Trag. Hist. 406, not 206. Helleborus; Cord. Annot. 93. *Helleborus niger ferulaceus*; Lob. Ic. 784. Park Parad. 291. f. 6. Ger. Em. 746.)

β. Mentzeli; De Cand. excluding the syn. of Linnaeus. (*Helleborus niger ferulaceus*, caule geniculato, flore magno, tulipæ minoris intar; Mentz. Pugill. t. 3; copied in Morif. sect. 6. t. 9. f. 2.)

γ. *Sibirica*, *Patrica*; De Cand. (*A.* n. 43; Gmel. Sib. v. 4. 200.)

Root somewhat tuberous. Stem branched from the bottom. Petals ten, fifteen, or more, elliptic-lanceolate. Calyx downy. Seeds hairy.—Native of mountainous or alpine situations, or open hills, in the isle of Oeland, Germany, the fourth of France, Switzerland, and Italy. Frequent with us in gardens, flowering in the early spring. The tuberous crown of the black perennial roots, lends down many long, simple, rather stout fibres. The stems are herbaceous, a foot high, striated, leafy, more or less branched from the lower part, in an alternate order, rarely besprinkled with a few loose scattered hairs. Leaves crowded, sessile, alternate, smooth, in many three-cleft, linear, acute, entire segments; channelled above. Flowers terminal, solitary, nearly sessile, large and handsome, an inch and a half or two inches broad, of a bright shining yellow. Calyx-leaves concave, ovate, downy, striated. Petals twice as long, sometimes above an inch, usually ten or twelve, but sometimes, even in a wild state, above twenty; purplish beneath; varying in breadth, but always somewhat elliptical, either obtuse or acute, a little crenate. Stamens numerous, capillary, short, with vertical quadrangular anthers. Germens numerous, ovate, compressed, more or less covered with short soft hairs, and hooked with the recurved styles, collected into a globular head, the

stalk much elongated as the fruit ripens. We readily follow De Candolle in thinking the plant of Mentzelius, (see β.) a very inconsiderable variety, differing only in having short and simple stems, with larger flowers: but Linnaeus has surely committed a great error in referring this plant to his *apennina*. The γ of De Candolle is said to have likewise a large flower.

10. *A. apennina*. Apennine *Adonis*. Linn. Sp. Pl. ed. 1. 548, excluding Mentzelius's synonym, ed. 2. 772. Willd. n. 5.—Root somewhat tuberous. Stem branched at the top. Petals fifteen, obovate. Calyx smooth. Seeds fringed.—Native of Siberia and the Apennines, according to Linnaeus, who cultivated this plant at Upsal, as appears by the original specimen in his herbarium. He always considered this species as very near the last, and has been unusually precise in marking their differences. The stem of the present is fifteen or eighteen inches high, with several branches about the upper part, not from the lower. Segments of the leaves more numerous, lanceolate, and shining. Calyx yellowish, smooth, flat, without veins. Petals obovate, imbricated, generally more numerous. Stamens much reflexed. The germens seem to be fringed only, not all over downy. Linnaeus concludes by observing that the former is entirely a vernal plant, as we find it; but the present lasts far into the summer. Nevertheless our intelligent friend M. De Candolle, who never saw this species but in the Linnaean collection, was induced, probably by the synonym of Mentzelius, which cannot be the same, to reduce it to *vernalis*. We find more difficulty in understanding the two following.

11. *A. wolgensis*. Wolga *Adonis*. De Cand. n. 9. *addend. 545. ("A. apennina; Pallas Nov. Act. Petrop. v. 10." Steven, who sent specimens to De Candolle.)—"Radical and lower stem-leaves reduced to slightly sheathing scales; middle and uppermost leaves sessile. Seeds somewhat downy. Calyx externally hairy. Petals ten or twelve, oblong."—Gathered by Mr. Steven, near the banks of the Wolga. Perennial. Intermediate between *vernalis* and *pyrenaica*, differing from the former in having a branched stem, more distant leaves, often wanting on the lower part of the branches, and much less downy seeds. From the latter it is distinguished by having its lower leaves abortive, like scales, and the seeds, at least while young, somewhat downy. From both it differs in the calyx being externally downy or finely hairy, not smooth. Mr. Steven met with *A. vernalis* likewise in Tauris. De Candolle. These remarks of our learned friend cause us no small perplexity. All our specimens of *A. vernalis*, from Switzerland and the fourth of France, as well as the authentic Linnaean specimen, and one from professor Jacquin, have a downy calyx, and most of them branched stems. The half-ripe seeds in Jacquin's plant are sparingly downy all over; the germens of those from Switzerland scarcely downy at all.

12. *A. pyrenaica*. Pyrenean *Adonis*. De Cand. n. 10. "Fl. Franc. v. 5. 635." (*A. apennina*; Gouan Illustr. 33.)—"Radical leaves on long stalks, ternate; leaflets in many deep segments: upper leaves sessile. Fruit smooth. Petals eight or ten, oblong-wedge-shaped, undivided."—Found by Gouan in the valley of Eynes, in the eastern Pyrenees, flowering in July. The other places of growth, mentioned by De Candolle, are all best omitted. He directs us in his *Addenda* to strike out the reference to Pallas, as belonging to *A. wolgensis*; and perhaps also that of Fischer, *A. charophylla*. To the latter alteration we heartily assent. Dr. Fischer's own specimen, seen in our hands by De

Candolle, has nothing but scales in the place of radical *leaves*, and certainly agrees in every respect with Jacquin's specimen of *vernalis* above-mentioned. The calyx is in the same manner hairy at the base only, a circumstance, indeed, on which, the more we enquire into it, the less we find reason to rely. Our specimen will not admit of an examination of the *germens*. M. De Candolle speaks of his *pyrenaica*, (a species entirely unknown to us,) as "akin to *vernalis*, but most certainly distinct. The stem is often above a foot high, and branched. Radical leaves on long three-cleft footstalks. Flower nearly sessile, at its first expansion among the uppermost leaves. Head of seeds raised on a greatly elongated stalk. Petals eight to ten, smaller and more obtuse than in *A. vernalis*. Fruit, even before it is ripe, smooth."

We do not presume to form any decisive opinion concerning the perennial species of *Adonis*, without the examination of sufficiently perfect specimens, in every state of growth; but it appears to us that they are by no means well determined at present, nor do we perceive that any characters hitherto suggested are sufficient for the purpose. The *vernalis* and *pyrenaica* are probably very distinct, for which we have the weighty opinion of De Candolle; but whether the latter may not be found in many other countries, and confounded by the generality of botanists with *vernalis*, is a point we cannot satisfactorily determine.

ADPRESSA FOLIA, Close-pressed Leaves, are such as have the upper surface closely applied to the stem, or branch, on which they grow. This is so complete in some plants, such as *Passerina hirsuta*, that only the under surface of each leaf being exposed to the air and light, the latter part appears to perform the functions proper to the upper surface of most leaves, and, in the instance just mentioned, assumes the deep green hue, and polished cuticle, usual on the upper side of leaves in general. Such is likewise the case with *Xeranthemum prostratum* and *scamoides* of Linnæus, now referred to **ELICHRYSUM**. See **LEAF**.

ADRASTÆA, so named by professor De Candolle, from *Adrastæa* or *Adrastia*, a surname of the goddess Nemesis, who was a daughter of Oceanus; because the plant in question is a native of New Holland, which has been called by some persons *Oceania*.—De Cand. Syst. v. 1. 424.—Class and order, *Decandria Digynia*. Nat. Ord. *Magnolæ*, Jusl. *Dilleniaceæ*, De Cand.

Eff. Ch. Calyx inferior, of five permanent pointed leaves. Petals five, oval, shorter than the calyx. Filaments flat. Anthers linear, of two cells bursting lengthwise. Germens two, globose. Styles straight, close together, awl-shaped; conical at the base. Capules membranous, of one cell. Seeds solitary?

1. *A. falsifolia*. Willow-leaved *Adrastæa*.—Native of bogs in New South Wales. Described by De Candolle from a dried specimen in Mr. Lambert's collection. This is a small shrub, approaching **HIBBERTIA**, (see that article,) in general appearance. The branches are round, long and slender, reddish-brown; downy when very young, but casting their cuticle in long portions when old. Leaves linear, entire, except three or five callous teeth at the extremity, the point being callous; their base somewhat contracted; their upper surface smooth, without veins; the under hoary with short silky hairs: their length is an inch and a half; breadth three lines; and they resemble the leaves of *Salix alba*, or of the Olive. Flowers at the ends of the young branches, solitary or in pairs, sessile between three or four crowded leaves, which exceed them in length. Calyx-leaves keeled, covered with close silky hairs; their margin mem-

branous; their point tipped with a bristle. Stamens ten, half the length of the calyx. Germens smooth.

ADRIANOPLÆ, col. 2, l. 3, r. 1453.

ADVANCE, in *Commerce*, denotes the information given by letter of a bill drawn by one merchant upon another.

ADVOCATE, l. 24, r. passed A.U. 549. Col. 2, l. 8, r. revived.

ÆCIDIDIUM, in *Botany*, from *αἰκία*, a wound or injury, because the parts of a plant to which this genus of parasitical fungi attaches itself, always, in consequence, become diseased, discoloured, and either tumid, or, as it were, blasted.—Perf. Obs. Mycol. fasc. 1. 97. Syn. Fung. 204.

—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*. Eff. Ch. Head conspicuous, sessile, round, membranous, at length bursting, with a toothed orifice. Seeds mealy, naked.

This genus is always parasitical on the backs of the leaves, or on the stem, of certain plants. In addition to what is said of it already, we shall subjoin illustrations of a few species. Perfoun defines twenty, in two sections.

SECT. 1. *Aggregate*. Heads assembled in patches, forming blotches on various leaves. Fourteen species.

Ae. cornutum. Horned *Æcidium*. Perf. n. 1. Obs. Mycol. fasc. 2. 22. t. 4. f. 2, 3. Sowerb. Fung. t. 319. (*Lycoperdon corniferum*; Fl. Dan. t. 838. L. corniculatum; Ehrh. Crypt. 200.)—Base yellowish. Heads nearly cylindrical, very long, curved, greyish-olive.—Found in autumn, on the leaves of the Mountain Ash. On the upper side of the leaf is seen an orange-coloured spot; on the under a swelling, out of which proceed six or seven bristle-like heads, a line and a half in length; each rather tumid at the base; contracted at the point, where it bursts irregularly.

Ae. cancellatum. Reticulated *Æcidium*. Perf. n. 2. Sowerb. Fung. t. 410. (*Lycoperdon cancellatum*; Jacq. Austr. v. 1. 13. t. 17. Fl. Dan. t. 704.)—Base tawny. Heads oblong, splitting into fibrous masses, cohering at the summit.—Not rare on the leaves of garden pear-trees. We first saw it on a baking pear at Sir A. Hume's, Wormleybury, many years ago, where it still frequently occurs, without injury to the tree or fruit. The heads are much thicker and shorter than the foregoing, and when ripe, discharge their powdery seeds between the tough, brownish, permanent fibres of the head, which last as long as the leaf, and actually seem an extension of its woody fibres. We cannot but conceive Mr. Sowerby's t. 409 to be a different plant, belonging to the genus **SPHERIA** (see that article); or rather perhaps **NEMASPORA**, to be hereafter described.

Ae. oxycanthæ. White-thorn *Æcidium*. Perf. n. 3. (*Ae. laceratum*; Sowerb. Fung. t. 318. *Lycoperdon penicillatum*; Fl. Dan. t. 839?)—Base unequal, rusty. Heads ash-coloured, cylindrical, splitting nearly from top to bottom, into numerous, fibrous, spreading segments.—Found on the leaves, or young buds, of Common Hawthorn. Perfoun describes his specimens as divided to the very base, and therefore presumes the plant of *Fl. Dan.*, which appears not split half way down, may be another species; but Mr. Sowerby's seems intermediate between both, and we can scarcely doubt his being the same as Perfoun's.

Ae. suffraginis. Colt's-foot *Æcidium*. Perf. n. 10. Relh. 546. Sowerb. Fung. t. 397. f. 1. (*Lycoperdon epiphyllum*; Linn. Sp. Pl. 1655. Fl. Succ. ed. 2. 459. With. v. 4. 383.)—Base tawny-purple. Heads funk, level-topped, with a many-cleft, reflexed border.—On the under side of the leaves of Colt's-foot and Butterbur, extremely common, in the form of broad orange-coloured spots, besprinkled

sprinkled with the little starry whitish orifices of the heads, full of orange powder. *Lycoperdon epithyllum* of Hudson and Lightfoot are different from this, and perhaps from each other. *Uredo tussilaginis* resembles our plant in general aspect, but on near examination will be found less distinct, in the form of an orange powder, intermixed with the cotton of the Colt's-foot leaf, without distinct white starry heads.

Ae. berberidis. Barberry Æcidium. Perf. n. 11. Sowerb. Fung. t. 397. f. 5. (*Lycoperdon pucilliforme*; Jacq. Coll. v. 1. 122. t. 4. f. 1.)—Base orbicular, scarcely convex. Heads cylindrical, somewhat elongated, yellow.—Found on leaves of the Barberry, in cold wet autumnal weather, sometimes in the spring, consisting of very conspicuous and prominent tawny spots, the heads projecting much. The orifice of each is neither dilated, nor conspicuously toothed or jagged. The whole turns brown, or black, in decay, and may be observed in that state on the fallen leaves during winter.

SECT. 2. *Simple. Heads scattered, not combined by any distinct crust, or base.* Six species.

Ae. euphorbiae. Spurge Æcidium. Perf. n. 15. "Humb. Friberg. 128." ("Lycoperdon euphorbiæ; Schrank. Bavar. v. 2. 631." *Efula* degener; Rivin. Tetrap. Irr. t. 113. f. 2.)—Simple, crowded. Heads pale, cylindrical, reflexed at the margin. Powder orange-coloured.—Frequent in summer on the leaves of *Euphorbia Cyparissias*, in Germany, France, and Switzerland, causing the whole plant to assume a diseased appearance, and often to fail of producing flowers. We scarcely think Rivinus, as Persoon hints, meant to consider this diseased *Euphorbia* as a distinct species.

Ae. tragopogi. Goat's-beard Æcidium. Perf. n. 15, b. Sowerb. Fung. t. 397. f. 2.—Scattered. Heads somewhat elliptical, with an irregularly torn white margin. Powder yellow.—On the stem and leaves of *Tragopogon pratensis*. Conspicuous for its short white heads. *Persoon*. That author certainly means to describe this as a distinct species from the last, though by an error, which ought to have been corrected in printing, he has given the same number to both. Hence he has really twenty species in all, though apparently but nineteen.

Ae. anemones. Wood-Anemone Æcidium. Perf. n. 17. Ust. Annal. v. 20. 135. (*Lycoperdon anemones*; Pulten. Tr. of Linn. Soc. v. 2. 311.)—Simple, scattered. Heads cylindrical, rather prominent, pale, mostly toothed, filled entirely with white powder.—Found in the spring on leaves of *Anemone nemorosa*, rendering the plant sickly, and often barren. Dr. Pulteney observed that this fungus originates under the cuticle, and may be seen, in a young state, through that membrane. At length each individual assumes a nearly globular form, bursting with lacerated edges, the cavity being lined with white powdery seeds, intermixed with minute fibres. In fading, each turns yellowish, then brown, and finally "each fungus is resolved into a farinose particle, resembling the fructification of a Polypody." *Pulteney*. The *Æ. fuscum*; Relh. Cant. 546. Sowerb. Fung. t. 53, found on the leaves and petals of the same species of *Anemone*, without injuring the plant, is the *Puccinia anemones*, Perf. Syn. Fung. 226, a genus described as destitute of a head, or peridium. In this respect we find it difficult to draw a line between Mr. Sowerby's figure, and his various representations of *Æcidia*, t. 398, though we doubt not the specific difference of the above two plants. Which of them is the "Conjurer of Chalmers's Fern," Dill. in Raii Syn. 124. t. 3. f. 1, may be doubted; but we rather suppose the *Puccinia*.

Ae. punctatum. Yellow-Anemone Æcidium. Perf. n. 18. Ust. Annal. v. 20. 135. (*Ae. anemones*; Hoffm. Germ. v. 2. t. 11. f. 1.)—"Simple, scattered. Heads partly sunk, their border nearly closed. Powder compact, brownish."—Found rarely on the leaves of *Anemone ranunculoides*, which it marks with brown dots. The border of the orifice is but slightly, if at all, toothed. *Seeds* chestnut-coloured. *Persoon*. We have not heard of this species in Britain.

Mr. Sowerby has represented several more species of this genus in his *Englisch Fungi*, t. 397, 398, such as *Æ. corni, confluentis, rubi, fragariae, menthae, salicis, cardui, rhei*; but we do not see clearly how the generic difference between *Æcidium* and *Puccinia* is, in most of them, to be determined.

ÆGÆ, l. 4, r. M. Gebelin.

ÆGERITA, in Botany, so called from *αἰγίτος*, a Poplar, or rather Alder tree, because the first-discovered species of this minute genus grows on the wood of the Alder, and was thence called *Sclerotium Aegerita*, which last word, on the establishment of the present genus, was taken for its generic name.—Perf. Syn. Fung. 684.—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Eff. Ch. Sessile granulations solid, filled with a somewhat mealy powder.

1. *Ae. candida*. White Aegerita. Perf. Disp. Fung. 40. (*Sclerotium Aegerita*; Hoffm. Germ. v. 2. t. 9. f. 1.)—Crowded, smooth, pure white.—Found not unfrequently in autumn, on the dry rotten wood of Alder, in moist situations. This fungus consists of numerous little crowded granulations, the size of millet-seed, globular or elliptical, as white as sugar-plums, solid but friable, the internal substance appearing, when highly magnified, full of seed-like bodies. *Hoffmann*.

2. *Ae. pallida*. Pale Aegerita. Perf. *ibid.*—Scattered, pale, somewhat warty.—On the fallen branches of Oaks. Distinguished by the inequality of its surface. *Persoon*.

3. *Æ. ? casta*. Grey Doubtful Aegerita. Perf. n. 3.—Scattered, glaucous or whitish.—On the trunks of trees in winter. Resembles small pale dots, of a softish substance; disappearing when dried. *Persoon*.

ÆGIALITIS, *αἰγῶλις*, an inhabitant of the coast, alluding to its place of growth.—Brown Prodr. Nov. Holl. v. 1. 426.—Class and order, *Pentandria Pentagynia*. Nat. Ord. *Aggregate*, Linn. *Plumbagineae*, Juss. *Plumbagineae*, Brown.

Eff. Ch. Calyx of one leaf, coriaceous, five-toothed, with folded angles. Petals five, their claws combined at the base, bearing the stamens. Stigmas capitate. Pericarp prominent, angular, nearly cylindrical, coriaceous, without valves. Seed germinating, without albumen. Plumula conspicuous.

1. *Ae. annulata*. Gathered by Mr. Brown, in the tropical part of New Holland, growing among *Rhizophora*, near the sea-shore. A perfectly smooth *strub*, of humble growth, having round, brittle branches, marked with annular scars, where the leaves have been. *Leaves* alternate, without stipulas, flat, coriaceous, ovate, entire; with their footstalks bordered, dilated and sheathing at the base. *Spikes* paniced. *Flowers* white, alternate, somewhat imbricated, with three bracteas. *Brown*.

Akin to **STATICÆ**. See that article, and **TAXAN-
THEMA**.

ÆGICERAS, so called from *αἴς*, a goat, and *κερας*, a horn, in allusion to the horn-like shape of the curved seed-vessel, the following is to be substituted in the place of our original article.—Gært. v. 1. 216. t. 46. Schreb. Gen. 156. Willd. Sp. Pl. v. 1. 1183. Mart. Mill. Dict. v. 1.

König Ann. of Bot. v. 1. 132. t. 3. Brown Prodr. Nov. Holl. v. 1. 534.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Myrsinæ*, Brown.

Gen. Ch. reformed. *Cal.* Perianth inferior, of five roundish-oblong, concave, coriaceous, permanent leaves, thickest at the base, obliquely imbricated at the margin. *Cor.* of one petal, falver-shaped, somewhat coriaceous; tube the length of the calyx, nearly cylindrical, thickish, rounded at the base; limb the length of the tube, in five deep, ovate, pointed, equal, reflexed segments. *Stam.* Filaments five, prominent, awl-shaped, twice the length of the tube, united at the bottom into a ring, attached to the base of the corolla; anthers arrow-shaped, incumbent, versatile, of two lobes and two cells, bursting longitudinally. *Pistl.* Germen superior, linear-oblong, compressed, dotted, with rudiments of several seeds; style erect, the length of the stamens, tapering, permanent; stigma simple. *Peric.* Follicle cylindrical, coriaceous, curved; pointed, of one cell. *Seed* solitary, oblong, nearly filling the pericarp, and germinating there, attached by a thin flat umbilical cord, of its own length, which is dilated into a hood-like, pointed, partial tunic, closely covering the minute cotyledons, and part of the radicle; albumen none; embryo erect; radicle very large.

Ess. Ch. Calyx in five deep imbricated segments. Corolla falver-shaped, five-cleft, reflexed. Filaments joined at the base. Stigma simple. Follicle coriaceous, cylindrical. Seed solitary, with a hooded tunic.

1. *Ae. fragrans*. Fragrant *Aegiceras*. König as above. Br. n. 1. (*Ae. majus*; Gært. n. as above. Willd. n. 1. *Rhizophora corniculata*; Linn. Sp. Pl. 635. Burm. Ind. 108. Pou-Kandel; Rheed. Hort. Malab. v. 6. 65. t. 36. *Mangium fruticosum corniculatum*; Rumph. Amboin. v. 3. 117. t. 77).—Native of the maritime woods and thickets of the East Indies, as well as of the tropical and eastern coasts of New Holland. The stems are rather shrubby than arborescent, several from the same root, ten to fourteen feet high, three or four inches in diameter, with numerous slender spreading branches. Leaves alternate, or imperfectly opposite, stalked, obovate, or somewhat elliptical, emarginate, entire, coriaceous, smooth, single-ribbed, from one to four inches long. They are reported to have a briny taste; and Mr. Browne noticed a saline efflorescence, or excretion, on their upper surface. Flowers white, fragrant, about half an inch broad before their corolla is reflexed, collected into umbels at the ends of the short lateral, as well as principal, branches. Seed-veffel near an inch and a half long, pointed, curved, but not spiral, as the generic name would seem to imply.

This shrub, which Linnæus confounded with his *Rhizophora*, is the only known species of a very distinct genus; the *Ae. minus*, Gært. t. 46, having been shewn by Mr. König to be *Conarus santaloides* of Vahl, Symb. v. 3. 87. *Santaloides*, Linn. Zeyl. 192. n. 408, a totally different plant in genus and natural order, though Gærtner has quoted for a synonym, *Umbraculum maris*, Rumph. Amboin. v. 3. 124. t. 82. This last, as well as *Mangium floridum* of the same writer, v. 3. 125. t. 83, appear very nearly related to our *Aegiceras fragrans*; inasmuch that, without specimens, no one can safely distinguish them from it, or from each other, for the difference of size in their respective flowers is of no avail in Rumphius's, always variously diminished, plates.

ÆGINETIA, a restored genus, first founded by Linnæus, subsequently reduced by himself to **OROBANCHE**, and originally named in honour of **PAUL ÆGINEA**. (See

those articles).—Linn. Gen. ed. 5. 280. Dryandr. in Roxb. Coromand. v. 1. 63. Willd. Sp. Pl. v. 3. 346.—Clafs and order, *Didymia Angiospermia*. Nat. Ord. *Perfonate*, Linn. *Pedicularæ*, Juss.

Gen. Ch. *Cal.* Perianth sheath-like, inferior, of one leaf, ovate, concave, inflated, coloured, permanent. *Cor.* of one petal, tubular, longer than the calyx; tube globular at the base, bent horizontally towards the middle, swelling upwards; limb spreading, in five short, rounded, equal segments. *Stam.* Filaments four, incurved, two shorter than the rest; anthers oblong, simple, converging in pairs, slightly bent. *Pistl.* Germen superior, ovate; style simple, curved, the length and position of the stamens; stigma capitate, large. *Peric.* Capsule ovate, pointed, of two valves? with many cells. *Seeds* numerous, minute. *Receptacles* several, convoluted, attached to the valves.

Ess. Ch. Calyx of one leaf, opening lengthwise. Corolla with five equal segments. Capsule of many cells. *Seeds* numerous.

1. *Ae. indica*. Indian *Aeginetia*. Linn. Sp. Pl. v. 1. 632. Roxb. Coromand. v. 1. 63. t. 91. Willd. n. 1. (*Orobanche Aeginetia*; Linn. Sp. Pl. ed. 2. 883. "Thiem-cumulu; Rheed. Hort. Malab. v. 11. 97. t. 47.")—Native of Malabar, in the hilly parts of the Circars, but rare. *Roxburgh*. Root of many simple fibres, probably parasitical and annual. *Stems* several, purplish, a span high, simple, single-flowered, and naked, except a lanceolate, brown, sheathing scale at the bottom of each. *Calyx* rusty-coloured, an inch long, turning green as it fades. *Corolla* half as long again as the calyx, and more slender, of a violet purple; the tube pale; deciduous. *Style* permanent as the fruit ripens, curved, projecting laterally out of the calyx. *Seeds* and *receptacles* tawny.

The generic distinctions between this plant and *Orobanche* are obvious enough; the single-leaved spathaceous calyx, regular corolla, undivided stigma, and many-celled capsule, whose internal structure Dr. Roxburgh says he could never well determine, but the numerous convoluted partitions, or receptacles, which he describes, are sufficiently different from *Orobanche*. As to habit, these genera nearly agree, both having a rusty pubescence, a purple hue, and, if we mistake not, parasitical roots; though the inflorescence, and the form of the calyx, differ in each. *Aeginetia* appears to want the nectariferous gland, found at the base of the germen, in front, in *Orobanche*; it wants also the bractæ, observable in every species of the last-named genus, except the *uniflora*.

ÆGISSUS. See **ÆGYPTUS**.

ÆGLE, in *Botany*, the name of one of the **HESPERIDES**, (see that article,) chosen by Mr. Correa de Serra for this genus, as Linnæus had already dedicated one to her sister *Arethusa*.—Correa Tr. of Linn. Soc. v. 5. 222. Ait. Hort. Kew. v. 3. 284.—Clafs and order, *Polyandria Monogynia*. Nat. Ord. *Aurantiæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, small, with five shallow lobes, at length deciduous. *Cor.* Petals five, ovate, acute, spreading, many times longer than the calyx. *Stam.* Filaments numerous, short, awl-shaped, inserted into the external part of the elevated receptacle of the flower; anthers oblong, erect, heart-shaped at the base. *Pistl.* Germen superior, ovate; style short, thick; stigma oval, obscurely furrowed. *Peric.* Berry coated, globular, smooth, almost woody when ripe, not bursting; of ten or twelve cells obliterated as the pulp arrives at maturity. *Seeds* ovate, compressed, numerous in each cell, in a simple row, each inserted by a short partial stalk into the central column; albumen none.

Eff. Ch. Petals five. Calyx five-cleft, inferior. Berry coated, of numerous cells. Seeds many.

1. *Ae. Marmelos*. Thorny Aegle, or Bengal Quince. Correa as above, 223. Willd. n. 1. Roxb. Coromand. v. 2. 23. t. 143. (*Cratæva Marmelos*; Linn. Sp. Pl. 637. Willd. Sp. Pl. v. 2. 853. *Cydonia exotica*; Bauh. Pin. 435. *Cucurbitifera trifolia* India, fructus pulpâ Cydonii æmula; Raii Hist. v. 2. 1665. Pluk. Phyt. t. 170. f. 5. Bilacus; Rumph. Amboin. v. 1. 197. t. 81. Covalam; Rheede Hort. Mal. v. 1. 37. t. 37. *Maredo* of the Telingas.)—Native of the mountainous parts of the coast of Malabar, sometimes of the low lands, flowering during the hot season. This is a rather large tree, whose trunk is nearly erect, clothed with ash-coloured bark. Branches scattered. Spines stipular, in pairs, awl-shaped, pungent, strong, an inch in length, sometimes wanting. Leaves irregularly scattered, on downy stalks, ternate; leaflets elliptic-oblong, with a blunt point, serrated, single-ribbed, veiny, smooth; tapering at the base; unequal in size; the odd one largest, about three inches long. Flowers of a dirty white, in short, aggregate, terminal and axillary, clusters. Fruit the size of a large orange, with a hard smooth greyish shell, from which the Dutch in Ceylon are said to prepare a perfume. Dr. Roxburgh speaks of this fruit as delicious to the taste, and exquisitely fragrant, of a laxative quality, which renders it particularly serviceable in habitual costiveness. A clear tenacious gum, enveloping the seeds, makes a good cement. The wood of the tree is hard and durable, of a light chocolate colour, variegated with dark veins, and serves for many purposes. Mr. Correa mentions another, likewise arboreous, species of *Aegle*, found in the East Indies, and preserved in Sir J. Banks's herbarium, but of this he has unfortunately neglected to give either a name or description, nor have we seen any specimens. See FERONIA for a genus next akin to the above.

AEGOPOGON, already mentioned and explained, in its proper place, as a synonym of the *Spirea Ulmaria*, or rather perhaps *S. Aruncus*, is now adopted for the generic appellation of a South American genus of grasses, by Willdenow, after Humboldt and Bonpland.—Willd. Sp. Pl. v. 4. 899. Palifot de Beauvois Agrost. 122. t. 22. f. 3, 4. Kunth Nov. Gen. et Sp. v. 1. 132.—Class and order, *Polygamia Monœcia*. (Rather *Triandria Digynia*.) Nat. Ord. *Gramina*.

Eff. Ch. Calyx of two valves, single-flowered; the valves cleft; with an intermediate awn. Corolla of two valves; the outer with three awns; inner with two. Seed solitary, unconnected with the glumes. One or two lateral male flowers.

1. *Ae. cenchroides*. Spreading Aegopogon. Willd. n. 1. Palif. de Beauv. as above, f. 3. Kunth n. 1. t. 42.—Cluster lax. Flowers all equally stalked.—Gathered by Humboldt and Bonpland, on the exposed summit of mount Avila, near the town of Caracas; also in Quito; flowering from January to April. Root perennial. Stems numerous, branched at the base, forming a tuft; those which do not flower, about as long as the finger; the rest a span in height, naked above, densely leafy below. Leaves linear; the lowermost an inch, or an inch and a half long; the upper ones shorter. Sheaths striated, smooth, slightly membranous at the edges. Stipula divided. Cluster simple, rather turned to one side, but spreading loosely. This grass has the aspect of *Cenchrus ciliaris*, or of *Lappago racemosa*. Willdenow. We know it only from this author's description, and the figures cited. From M. de Beauvois our knowledge of the following species is entirely derived.

2. *Ae. pusillus*. Small Aegopogon. Palif. de Beauv. as above, f. 4.—Cluster dense, turned one way. Perfect flower sessile.—Native country not recorded. The perfect flowers of this species, whose cluster is represented about half the size of the foregoing, are sessile, their calyx apparently of two equal, awl-shaped, undivided glumes. The two lateral, or male, flowers are elevated on equal, slender, parallel stalks, twice their own length, though but half as long as the intermediate perfect flower. The inner valve of their calyx seems entire, though awned. Their corolla consists of two entire, not cleft, valves, one of which only is awned. We do not pretend, without the investigation of specimens, to reconcile these contradictions of the generic character, nor to judge how far M. de Beauvois is right in uniting with this genus Mr. Brown's AMPHIPOGON, hereafter to be noticed in its proper place.

3. *Ae. geminiflorus*. Twin-flowered Aegopogon. Kunth as above n. 2. t. 43.—Male flower solitary.—Gathered by Humboldt and Bonpland, on the banks of the river Orinoco, between Cerro Duida and Rio Tamatama, near Esmeraldam, flowering in May. Habit much like the first species, but the spikelets are considerably smaller, while the central awn of one valve of the perfect flower is remarkably long, stout, and rough. Each flower is supported by a short partial stalk, and there are only two to each spikelet, not three as in the two foregoing species.

ÆOLUS, in *Mechanics*, subjoin, see VENTILATOR.

ÆON, l. 4, add.—Homer II. v. 453. Pindar Olym. A. v. 18. Hence by an easy figure it is used to denote the customs and manners of life. Esper. ii. 2.

ÆRIDES, in *Botany*, from *anz, air, air*; because one of the principal plants of this genus has long been celebrated, under the name of *Flos aëris*, for living entirely, as was supposed, upon air. This plant, and several others agreeing with it in habit, though not all perhaps in generic character, have been sent from the East Indies to Europe, in baskets, without earth or any other apparent source of nutriment, and have not only survived, but blossomed during their voyage, as well as after their arrival. Their stout fibrous roots, always more than half naked as they run over the branches of trees, having entwined themselves among the sticks of the basket, might perhaps imbibe sustenance from the air in those circumstances, as readily as in their natural situation; just as a pea will germinate and grow in moist cotton.—Lourei. Cochinch. 525. Swartz in Schrad. Journ. v. 2. 233. t. 2. f. 4. Eujud. Neues Journ. v. 1. 88. Koñ. Tracts 195. t. 8. f. Y. Willd. Sp. Pl. v. 4. 130. Ait. Hort. Kew. v. 5. 213.—Class and order, *Gynandria Monogynia*. Nat. Ord. *Orchidæ*.

Gen. Ch. reformed. Cal. Perianth of three equal, spreading, coloured leaves, gradually dilated upwards, somewhat wavy, rather obtuse. Cor. Petals two, much like the calyx-leaves in colour, size, and figure. Nectary a lip without a spur, shorter than the petals, inserted into the base of the style, gibbous underneath like a bag, often reversed over the column. Stam. Anther a vertical, hemispherical, moveable, deciduous lid, of two or four cells; masses of pollen globular, stalked, in pairs. Pist. Germen inferior, oblong; style erect, semi-cylindrical, concave in front; stigma in front, near the anther. Peric. Capsule obovate-oblong, with three large and three intermediate angles, of one cell and three valves, separating between the angles. Seeds numerous, minute, each invested with a chaffy tunic.

Eff. Ch. Calyx and corolla spreading; nearly uniform. Lip pouch-like, without a spur. Anther a vertical moveable lid.

AERIDES.

The species of this rare oriental genus are not at all diffinitely known. Willdenow enumerates seven, to which we have some additions.

1. *A. retufum*. Blunt-leaved Air-blossom. Swartz n. 1. Willd. n. 1. (*Epidendrum retufum*; Linn. Sp. Pl. 1351. *Limodorum retufum*; Swartz Nov. Act. Upf. v. 6. 80. Amfeli Maravara; Rheed Hort. Malab. v. 12. 1. t. 1. Raii Hist. v. 3. 588. *Orchis abortiva aizoides malabariefis*, flore odoratiffimo variegato, intus aviculum repræfentante; Rudd. Elyf. v. 2. 220. f. 5.)—Leaves nearly radical, linear, with two equal terminal notches. Clufter many-flowered, twice the length of the leaves. Capfules obovate.—Native of trees in the East Indies, flowering at the beginning and end of the rainy feafon, that is, in April and October, and lafting long. The plant is three feet high, attached to the bark by thick inflexed downy-coated fibrous roots, of a mufky fmell. Leaves fpreading in two ranks, linear, ftout, rigid, channelled, fmoth, abrupt as if bitten off at the end, which feems characteristic of the genus; in this fpecies the two notches are repræfented in the figure, which is all our authority, as equal and uniform. The flowers are very numerous, about forty, in feveral ftalked, terminal clufter, all expanded at once, whitifh befprinkled with red, blue and duiky fspots. The lip is faid to be pure white on both fides, with a tongue-like appendage, brilliant with blue and red. Each flower is lefs than an inch in diameter.

2. *A. præmorfum*. Jagged-leaved Air-blossom. Willd. n. 2. ("Bitim Maram Maravara; Rheed Hort. Malab. v. 12. 5. t. 2.") Raii Hist. v. 3. 589. *Orchis abortiva aizoides malabariefis altera*, flore odorato fanguineo colore, intus aviculum purpureum referente; Rudd. Elyf. v. 2. 221. f. 6.)—Leaves radical, linear, variously and unequally notched at the end. Clufter many-flowered, twice the length of the leaves. Capfules cylindrical.—Found on trees in Malabar. Nearly akin to the preceding, the flowers being in like manner fotted with red and blue, and moreover with yellow and green. The column is purple. Rheed fays this fpecies acquires a poisonous property by growing on the *Cansjira*, a shrub or tree akin to *Daphne*; which, if correct, is very remarkable. Perhaps fragments of the bark of that tree, which may well be fuppofed highly virulent, may have been gathered with the roots of the parasitical plant.

3. *A. lafiopetalum*. Woolly-flowered Air-blossom. Willd. n. 3. (*Epidendrum Flos aëris*? Retz. Obf. fasc. 6. 64.)—Stem branched, creeping. Leaves ovate-oblong, each feated on a bulb. Calyx externally woolly, acute as well as the petals.—Found by Kœnig, on trees in the East Indies. There is nothing in Kœnig's defcription of the flower to convince us of this being an *Aerides*, while the account of its acute leaves, (not defcribed as jagged or abrupt,) and their bulbous accompaniment, render it probable that Willdenow has here made a miftake. We retain this fpecies and the next, merely as we find them in his work, for future enquiry.

4. *A. ? matuinum*. Morning Air-blossom. Willd. n. 4. (*Epidendrum Flos aëris*, vel Saaronicum; Retz. Obf. fasc. 6. 58.)—This having a spur to the *nectary*, according to Kœnig's defcription, cannot belong to the genus before us. We therefore decline attempting a fpecific character, or any neceffary correction of Willdenow's.

5. *A. odoratum*. Fragrant Air-blossom. Willd. n. 5. Ait. n. 1. (*A. odorata*; Loureir. n. 1.)—Stem afcending. Leaves linear, emarginate, reflexed. Clufter axillary. Lip three-cleft; lateral fegments obtufe. Clufter on trees in

China and Cochinchina, fometimes pendulous. Root of numerous thick fibres, entangled together. Stem nearly erect, a foot high. Leaves large and thick. Clusters fimple, long, drooping. Flowers pale, rather fleshy, fweet-scented. If this fpecies be hung up in a houfe, it will continue to grow, and to flower for many fuccellive years; which Loureiro fays he had long experienced. Sir Joseph Banks is recorded to have introduced this *Aerides* into the ftoves at Kew, in 1800, but it has never flowered. The late duchefs of Portland received an air-plant, as it was called, from China or the East Indies, about twenty-five years ago, which we rather believe to have been the *Epidendrum iffellatum*, Roxb. Corom. v. 1. 34. t. 42. *Cymbidium* n. 34. Willd. Sp. Pl. v. 4. 102; or at leaft very near that fpecies. It came in a bafket, without earth, in perfect health, and afterwards bloffomed in the ftove at Bulltrode; whether it enjoyed any different treatment there we have no recollection.

6. *A. arachnites*. Great Japanese Air-blossom. Swartz n. 2. Willd. n. 6. (*Epidendrum Flos aëris*; Linn. Sp. Pl. 1348. E. n. 7; Linn. Act. Upf. ann. 1740. 37. *Limodorum Flos aëris*; Swartz Nov. Act. Upf. v. 6. 80. Angurek Katong-ging; Kæmpf. Amœn. Exot. 868. t. 869. f. 1.)—Stem afcending. Leaves linear-lanceolate. Calyx-leaves and petals linear, revolute; dilated at the extremity. Lip cloven in front, with an internal cloven appendage.—Native of Japan, growing parasitically on trees, and much admired for the mufky fcent of its large handsome flowers. The leaves are faid to be narrow, thick, and rufhy. Flowers from feven to twelve together, in a loofe fimple clufter. Calyx-leaves and petals all nearly fimilar, each two inches long, linear; convex above; concave underneath; fuddenly dilated at the end into a quadrangular form, all lemon-coloured, beautifully fotted with purple. *Nectary* much fhorter than the petals, fomewhat ftalked, confifting of a hollow abrupt lip, fmoth, cloven deeply in front, ending below in a fhort point, from whose cavity fprings an erect, fleshy, divided lobe or appendage. Such is the *nectary* of the plant figured by Dr. Swartz, of which two fpecimens are preferred in the Linnæan herbarium; but Kæmpfer's figure exhibits a very different appearance of the fame part, like three hairy leaves furrounding the column, in a manner we have never witneffed in any one of the *Orchideæ*. We fufpect two fpecies may be confounded by authors.

7. *A. coriaceum*. Leathery-leaved Air-blossom. Swartz n. 4. tab. 2. f. 4, e, f. Willd. n. 7.—"Stem-leaves ovate, pointed, fomewhat coriaceous, ftriated. Spikes paniced."—Found on trees in Madagafcar. The flower as repræfented in Dr. Swartz's figure, which is all we know of this plant, is hardly an inch wide; the lip a deep pouch, bearing in front a fmall deflexed appendage. Column very fhort.

8. *A. Boraffi*. Fan-palm Air-blossom. Buchanan MSS.—Leaves radical, linear-oblong, obtufe, obliquely emarginate. Clufter leaflefs, radical. Lip with a revolute undivided border.—Found by Dr. Buchanan growing on *Boraffus flabellifer*, in the Myfore. The thick cracked or jointed fibres of the root have each a central tough thread. Stem none. Leaves equitant, about fix, a fpan long and an inch wide; their points rounded, but unequally, one fide extending further beyond the notch than the other. Clufter fimple, fcarcely ftalked, twice the length of the foliage, deflexed, many-flowered, lax, with a few fheathing fcales at the bafe. Flowers about an inch and a half in diameter. Calyx-leaves ovato-lanceolate, obtufe, fomewhat revolute, near an inch long, pale buff with a purplifh central ftripe. Petals like them, but flat, and rather broader. *Nectary* half

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as long, red, ringent, its revolute border as long as the pouch.

9. *A. maculatum*. Spotted-stalked Air-blossom. Buch. MSS.—Stem creeping. Leaves elliptic-oblong, equally emarginate. Clutter lateral, stalked, corymbose. Lip the length of the petals; its border pointed, dilated at each side.—Gathered by Dr. Buchanan, on trees in the Myfore country. The stems send out very long curling fibrous roots. Branches short, leafy. Leaves obtuse, emarginate, hardly two inches long; sheathing at the base. Flower-stalk lateral, opposite to the lowest leaf on the branch, and protruding through its split base, a span long, erect, copiously spotted with dark purple, furnished with a few scattered bractæ, and terminating in a dense corymbose cluster of six or eight yellow unspotted flowers, with a similar bractæ to each partial stalk. Calyx-leaves and petals obovate, about half an inch long, nearly uniform. Lip somewhat boat-shaped, with a deep keel, and prominent ascending point, accompanied at each side by a rounded dilatation of the margin. The back of the flower is tinged with greenish or purplish brown.

10. *A. dasygogon*. Densely-bearded Air-blossom.—Stem ascending. Leaves ovate, with a jagged point. Umbels dense. Border of the lip kidney-shaped, densely bearded.—Found by Dr. Buchanan, in Upper Nepal. Roots composed of long, white, entangled fibres, running over the mossy branches of trees. Stems solitary, short, recurved, leafy. Leaves alternate, sheathing, broadly ovate, about three inches long, fleshy; smooth above; minutely scaly beneath; somewhat revolute; with three crowded, unequal, sharp teeth at the point. Flower-stalks lateral, solitary, half the length of the leaves, each bearing a dense umbel of numerous, nearly sessile, very beautiful and singular, reversed flowers, each hardly an inch in diameter. Calyx-leaves and petals similar, obovate concave; dark red on the upper side; green on the under. Lip keeled, but not very deeply, globose, yellowish, spotted with red; its border as long as the petals, dilated, kidney-shaped, white; dotted on the smooth disk with crimson; fringed and thickly clothed towards each side with short, fibrous processes, resembling velvet. Capsule three inches long.

11. *A. calcolare*. Slipper Air-blossom. Buch. MSS.—Stem creeping. Leaves linear-oblong, falcate, unequally jagged at the point. Umbels spreading. Border of the lip hemispherical, densely bearded.—Gathered by Dr. Buchanan, on the mossy branches of trees, in Upper Nepal. Stem creeping, by means of very long, simple, stout fibres, thrown out from within the sheaths of former leaves; its upper part ascending, leafy, three or four inches long. Leaves two-ranked, spreading, ascending, a span long, hardly an inch broad; jagged, with two sharp teeth, at one side of the point only. Umbels opposite to several of the lower leaves, solitary, stalked, lax, each of about five flowers, which are rather smaller than those of the last species, but the pouch of the lip is considerably larger in proportion, prominent, yellow variegated with red, as well as the disk of its border, which last is densely bearded with white fibres like the foregoing. Calyx-leaves and petals uniform, obovate, incurved, yellow spotted with red.

12. *A. rigidum*. Rigid Air-blossom. Buch. MSS.—Stem creeping. Leaves oblong, obtuse, rounded, unequally at the point, four times as long as the corymbose clusters. Lip with an obovate smooth border, the size and shape of the petals.—Found by Dr. Buchanan, running over rocks and large stones in Upper Nepal. The stem is woody, a yard long, and as thick as the finger, creeping among mosses, and sending out here and there, through the bases of

the leaves, very thick radicles. Leaves two-ranked, alternate, a foot long, extremely thick and coriaceous, three-ribbed, oblique at the termination, one side being greatly extended, in a round lobe, beyond the rib, the other flopping off below it. The lower part of each leaf has a joint, where it finally separates, leaving the sheathing permanent base, or footstalk, as in *A. Borassi*, *maculatum*, and others of this genus and natural order. Flower-stalks opposite to the leaves, solitary, alternate, about three inches long, distantly racemose in the lower part, corymbose at the summit, each bearing from five to seven nearly or quite sessile flowers, yellow spotted with red, about the size of the last. Calyx-leaves and petals obovate, uniform, erect. Lip agreeing with them in colour and shape, except the small prominent pouch at its base, and the apex being a little reflexed.

13. *A. undulatum*. Wavy-flowered Air-blossom. (*Epidendrum præmorium*; Roxb. *Corom.* v. 1. 34. t. 43. *Cymbidium præmorium*; Swartz *Nov. Act. Upf.* v. 6. 75. Schrad. *Neues Journ.* v. 1. 75. Willd. *Sp. Pl.* v. 4. 103. Thalia Maravara; Rheede *Hort. Malab.* v. 12. 6. t. 4. Raii *Hist.* v. 3. 590. *Orchis abortiva*, floribus luteis minoribus, radiis rubris; *Rudd. Elyf.* v. 2. 222. f. 8.)—Stem ascending. Leaves linear, channelled, abrupt, acutely pointed, thrice as long as the corymbose clusters. Lip with an obovate flat border, the size and shape of the petals.—Native of trunks and branches of trees, in the hilly parts of Malabar and Coromandel, flowering in October. The roots consist of numerous long stout fibres. Stem ascending, leafy, four or five inches high. Leaves two-ranked, alternate, recurved, coriaceous, six inches long and one broad, concave, ending in a femicircular notch, whose two extremities are pointed, and nearly equal. Inflorescence like the last. Flowers rather smaller, fragrant. Calyx-leaves and petals obovate, equal, slightly wavy at the edges, yellow, marked with transverse, crimson, undulating lines. Lip the size and shape of the petals, white dotted with red, its pouch but slightly indicated in parts of Dr. Roxburgh's figure, and probably so little obvious in nature, as to have easily escaped the artist's notice. Notwithstanding this apparent exception to the generic character, the present plant, improperly confounded by Linnaeus with his *Epidendrum furvum*, is so strikingly allied to the last, and consequently to the two immediately preceding, that we must presume it to be an *Aerides*. If, on examination, it should prove to want the pouch, a fresh investigation must be instituted, respecting the distinguishing characters of this genus and *Cymbidium*.

The habit of *Aerides* is peculiar, though not perhaps exclusively so, in the termination of its leaves, always more or less abrupt, unequal, or jagged. We have never seen a living specimen of any of the genus, but Dr. Buchanan's fine and scientific coloured figures, drawn from nature under his own inspection, are as precise and satisfactory as possible, and that excellent botanist has himself pointed out to us the characters and habit of *Aerides*, as a natural genus.

With regard to the name, it well expresses the quality of living upon air alone, for which several species have attracted notice. Linnæus, who included the whole, with various other things, in his genus of EPIDENDRUM, (see that article,) particularly applied the specific name of *Flos aëris* to our sixth species, citing with a query in *Ab. Upf.* the 2d chapter verse 7th of the Wisdom of Solomon. This, in the English translation is, "Let no flower of the spring pass by us." In a Latin version before us this text is rendered "*ne prætereant nos juvenudo aër.*" Whence this ambiguity arose, or whether Linnæus had any where read *flos veris*, which he confounded with *flos aëris*, we have not materials to determine. At any rate, the text in question has evidently

no reference to this, or to any other particular plant whatever.

AEROSTATION, col. 5, l. 39, for 84 r. 840; col. 27, l. 17, for circumference r. diameter.

ÆRUGINOSUS, in *Ornithology*. See *Moor Buzzard*.

ÆSCHYLUS, col. 2, l. 24, for wrote r. chose; l. 29, for furious r. ferocious; l. 36, for referred r. transferred.

ÆSOP, col. 2, l. 60, r. lived more than 350 years, &c. **ÆSOP**, **CLODIUS**, l. 2, after Rome, add, B.C. 79.

AESTIVATIO, in *Botany and Vegetable Physiology*, a term used by Linnæus for the mode in which the petals, or the segments, of a corolla are arranged with respect to each other, particularly before they expand. (See **COROLLA**.) The word comes from *æstas*, summer, and *æstiva*, summer-quarters, summer being the usual flowering season, and the corolla the shelter or accompaniment of the organs of fecundation. So *Vernatio* expresses the arrangement of the leaves of plants in the bud, or, in other words, their vernal condition. *Æstivatio imbricata*, expresses the divisions of the corolla being imbricated, or folded over each other, either from left to right, that is, with the motion of the fan, as in *Cistus*; or the reverse, of which latter Linnæus has in his manuscripts mentioned *Phlox* as one example, and we would point out *Hypericum* as another. *Æstivatio valvata* is when the divisions of the corolla meet in the bud like valves, side by side, as in *Protea* and its allies. Of this *Periploca* is an instance, notwithstanding the obliquity observable in the segments of that flower after expansion. Linnæus, in the MSS. above cited, speaks of *Pœonia* as having, like its near relation *Aconitum*, one petal exterior to all the rest, though the corolla is what would be termed regular in the first genus, and very irregular in the second. Such a diversity indeed is of small moment, for Mr. Correa has observed that every natural order, as far as he could examine, possesses irregular and regular flowers. In general the direction of the parts of a corolla, as to their æstivation (if we may use that word), are invariably alike in genera of the same natural order. But **HERMANNIA**, (see that article,) affords a remarkable exception, every one of its species that we have seen bearing two flowers on the same stalk, has the petals of one of those flowers rolled to the right, while those of the other are disposed in a contrary position. Mr. Brown, in his learned *Prodromus* of New Holland plants, has paid more attention to the æstivation, in defining his natural orders, than any other botanist, and the term *æstivatio valvata* is, if we mistake not, his own invention.

ÆTH, l. 4, insert after Brussels. It is the chief place of a canton, in the department of Jemappe, and district of Tournay. The place contains 7634, and the canton 14,828 inhabitants. The territory includes 115 kilometres, and 11 communes. See **ATH**.

AETHIONEMA, in *Botany*, so named by Mr. Brown, apparently in allusion to some tawny or sun-burnt tinge in the filaments, from *æthra*, to scorch, and *νμα*, a filament. We perceive in our dried specimens an occasional purple hue in these parts. It may perhaps be more remarkable in the species we have not seen.—Brown in *Ait. Hort. Kew. v. 4. 8c.*—Class and order, *Tetradynamia Siliculosa*. Nat. Ord. *Siliquosæ*, Linn. *Crucifera*, Juss.

Ælf, Ch. Pouch with boat-like winged valves (sometimes not curving). Longer filaments either combined, or finely toothed towards the top. Insertion of the calyx unequal.

1. *Ac. faxatila*. Rock Aethionema. *Ait. n. 1.*

(*Thlaspi faxatile*; Linn. Sp. Pl. 901. "Schkuhr Handb. v. 2. 223. t. 180." See **THLASPI**, n. 6.)—Longer filaments distinct. Leaves oblong, tapering at the base.—Native of the south of Europe. Cultivated by Miller in 1759.

2. *Ac. monospermum*. One-seeded Aethionema. *Ait. n. 2.*—"Pouch single-feeded, without valves. Leaves oval or obovate."—Native of Spain. Cultivated in 1778, by Lee and Kennedy, at Hammermith. A hardy biennial, flowering in July and August. We have seen no specimen of this species. Our doubts respecting the genus may be found under **THLASPI**.

AFER, **DOMITIUS**, col. 2, l. 11, for vanity r. variety.

AFFINITY, in *Chemistry*. The celebrated doctrine of Bergman is the last in order discussed under the article **AFFINITY** in the Cyclopædia: since that time, however, very important changes in opinion have taken place, among chemists, respecting the nature and cause of chemical affinity. Some of these are mentioned in subsequent parts of the Cyclopædia, especially in the articles *Chemical Proportions*, *Simple Bodies*, and *Atomic Theory*; but it may not be deemed superfluous to give a summary and connected view of the whole in this place.

Bergman's doctrine of *elective affinity*, so amply explained in the article above referred to, was universally admitted among chemists till 1803, when Berthollet published his Dissertation on Affinity in the Memoirs of the Institute, and about the same time his Chemical Statics. Berthollet considered affinity as an attraction existing between combining bodies. This attraction he appeared to consider as similar in its nature to that which exists between the planets, or in short, the principle of gravitation. It consequently, in his opinion, increased with the mass of bodies. According to this doctrine, therefore, bodies which have an affinity or attraction for one another, have a tendency always to combine, in a greater or less degree, chiefly in proportion to their mass. Thus, though barytes appears to possess a stronger affinity for sulphuric acid than potash, yet if we present a great quantity of potash to a small quantity of sulphate of barytes, the potash will separate a portion of the acid.

According to Berthollet, therefore, affinity is not *elective*. A substance which has a stronger affinity is not capable of separating entirely those which have a weaker, unless some other cause than mere strength of affinity operates. Instead of separating entirely the weaker body, it divides with it the base to which that body was united, each combining with a part of such base in the compound proportion of the strength of its affinity and of its quantity.

But no facts in chemistry are better established than those in which the addition of a third body frequently separates two substances previously united, the third body taking the place of one of the constituents, which is thereby separated altogether. Thus, if sulphuric acid be dropped into a solution of nitrate of barytes, or potash into a solution of nitrate of lime, the sulphate of barytes and the lime will precipitate, leaving, in the first instance, the nitric acid in a free state, and in the second, the potash combined with the nitric acid instead of the lime. These and many other well-known facts appearing, at first sight, contrary to Berthollet's doctrine, it was necessary for him to reconcile them to it. For this purpose, he called in the aid of the different modes of existence of bodies. According to him, therefore, whenever decomposition takes place, it is owing either to the *insolubility* or the *elasticity* of the ingredient which separates. Sulphate of barytes being insoluble in water, while nitrate of barytes and nitric acid are soluble in that liquid, it must happen,

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happen, when the substances are mixed, that the insoluble salt precipitates, on account of its insolubility. It is the insolubility of lime that causes it to precipitate when potash is dropped into nitrate of lime. Accordingly, when potash is dropped into nitrate of soda, no precipitation whatever takes place, because both the potash and the soda are very soluble in water; but if we concentrate the solution sufficiently by evaporation, crystals of nitrate of potash will be deposited, because that salt is much less soluble in water than nitrate of soda. So also, when nitric acid is poured upon carbonate of lime, the carbonic acid is disengaged, and flies off, because its elasticity induces it to separate from the solid, and assume the gaseous state as soon as the nitric acid weakens the attraction, by means of which it was attached to the lime.

"Thus," says Dr. Thomson, to whom we have been particularly indebted in the compilation of the present article, "we have two doctrines respecting affinity opposite to each other. According to Bergman, affinity is *elective*. The body which has the stronger affinity displaces that which has a weaker, and the strength of affinity may be measured by decomposition. According to Berthollet, affinity is *not elective*. It never produces decompositions, but only combinations, and the decompositions which take place are owing to the agency of other causes. The strength of affinity is not an absolute quantity, but increases with the mass of the attracting body. Berthollet's doctrines lead to the opinion, that bodies are capable of uniting together indefinitely in any proportion whatever: Bergman's, that they unite only in determinate proportions, and that these proportions are independent of the relative quantities of the combining substances which are present." See *Atomic Theory*.

A most important fact respecting the combination of bodies was ascertained by Richter. This was illustrated in an elaborate work, published at different times between 1792 and 1802, which contains the result of his researches on the decompositions and combinations of chemical bodies. He observed, that when two neutral salts, which mutually decompose each other, are mixed together, the two newly formed salts still retain the same neutral state as the two original ones, from which they were formed. He likewise observed, that the same proportions of bases that saturate a given weight of one acid, saturate all the other acids; and the same proportion of acids that saturate one base, saturate all the other bases; which law enabled him to explain why two neutral salts form, as above-mentioned, two new salts, likewise neutral. These experiments and observations of Richter likewise enabled Fischer to attach a set of numbers to the acids and bases, indicating the weight of each which will saturate the numbers attached to all the other acids and bases.

Mr. Dalton, without being aware of the law already discovered by Richter, turned his attention to the subject about two years afterwards, and was struck with the small number of proportions in which simple substances are capable of combining, and the constancy of these proportions. This led him to form the doctrine of definite proportions, or atoms, as it is usually termed, and which, as well as Gay Lussac's modification of it, our readers will find fully explained in the article *Definite Proportions*.

About the same period, that is, in the year 1803, the grand law respecting the agency of the galvanic battery in the decomposition of bodies was discovered by Berzelius and Hisinger. This law is, that *oxygen and acids* are accumulated round the *positive pole*; while *hydrogen, alkalis,*

earths, and metals, are accumulated round the *negative pole*. From this general law Berzelius deduced the consequence, that the decompositions in such instances were owing to the attractions existing between the bodies and the respective electricities. This opinion was afterwards extended by Davy, and the opinion in its extended form subsequently adopted by Berzelius himself. According to these celebrated chemists, chemical affinity is identical with electrical attraction, and bodies which unite chemically possess different kinds of electrical attractions. Every body, in their opinion, possesses a permanent elective state, either resinous or vitreous. Two bodies in the same state of electricity have no affinity for each other. Those in opposite states have an affinity, and the strength of the affinity is proportional to the degree of intensity of the different electricities in the two bodies; and in order to make bodies separate from each other, we have only to bring them into the same electrical state, by making them both vitreous or both resinous. See *ELECTRICITY* and *GALVANISM*.

Such is a summary account of the revolutions in opinion which have taken place respecting the nature of chemical affinity, and the principal discoveries which have given origin to these changes since the time of Bergman. We shall conclude this article with a few general remarks upon the subject.

In the first place, the question whether the affinities of substances for one another be definite quantities capable of being represented by numbers, cannot, in the present state of chemical science, be satisfactorily determined. For though some substances always appear capable of separating others, as, for example, barytes, potash; yet the reason may be, that the salts of barytes are less soluble than the salts of potash. Again, iron, as is well known, separates oxygen from water at all temperatures; but, on the other hand, it has been equally well ascertained, that the oxyd of iron is reduced when heated in hydrogen gas: "hence," says Dr. Thomson, "we have no data for determining whether iron or hydrogen have the greatest affinity for oxygen; each seeming capable of depriving the other of oxygen in the very same circumstances."

In certain cases, also, of double decompositions, it is often equally difficult to distinguish on which side the strongest affinities lie. Thus, as is well known, carbonate of barytes and sulphate of potash, when digested together, decompose each other, and are converted into sulphate of barytes and carbonate of potash; but on the other hand, it has been equally satisfactorily shewn by Mr. Phillips, that carbonate of potash is capable of decomposing the sulphate of barytes.

Pfaff, however, has shewn, that the tartrate of lime and the oxalate of lead are completely decomposed by the addition of no more sulphuric acid than is necessary to form sulphate of lime and sulphate of lead; and hence he infers, that the affinity of sulphuric acid for lime and lead is actually superior to the affinities of tartaric and oxalic acids for the same bases respectively.

Berthollet has attempted to account for the first of the above experiments by the effect of *mass*; and the experiments of Pfaff he endeavours to explain by the solubility of tartrate of lime and oxalate of lead, and the insolubility of the sulphate of lime and sulphate of lead in acids. And this brings us,

In the second place, to make a few remarks upon the supposed effects of *mass*, and the *modes of existence* of bodies in modifying chemical decompositions. With respect

to the effects of *mast*, though at first sight there appear to be some circumstances favouring the opinions of Berthollet respecting its influence in chemical operations, yet we can by no means agree in supposing its influence to be great as represented by that eminent chemist. No quantity of water, for example, would decompose sulphate of magnesia, though the affinity of sulphuric acid for water is very great, and though the insoluble nature of magnesia would, according to Berthollet's views, favour the union of the water with the acid. *Mast* here, therefore, either does not operate at all, or very feebly; and there are numerous analogous instances, well known to every chemist, to which the same remarks are equally applicable.

Again, it has been sufficiently established, that gases unite with reference to their volume, and cannot be made to unite in intermediate proportions, even although the result of their union be likewise a gas. Thus, for example, one volume of chlorine gas and one volume of hydrogen gas unite together, and form, without any condensation, or other apparent physical change, two volumes of muriatic acid gas, nor can they be made to unite in any other proportions. Here then is an example of chemical union, in which the effects of *mast* and *mode of existence* are quite out of the question.

From these, and particularly from many recently established facts, we think it proved beyond a doubt, that the power which determines bodies to combine in certain proportions is a property inherent in the original cause of their union, and consequently is a power totally different from that exerted by masts or other external circumstance, though it is not perhaps altogether independent of their influence. For further information, we refer our readers to Sir Humphry Davy's Elements of Chemical Philosophy, where, besides an excellent account of the subject in general, they will find a matterly refutation of Berthollet's doctrines.

AFÖRE, l. 2, for item r. stem; l. 4, ditto.

AFZELIA, in *Botany*, (see that article,) is *Gerardia caffoides*, Pursh 424. (G. Afzelia; Michaux Boreal.-Amer. v. 2. 20. Anonyms caffoides; Walt. Carolin. 171.)—"Panicle, with wand-like branches. Leaves pinnatifid, with linear bristle-like segments."—In dry sandy woods of Carolina and Georgia. Annual, flowering in July and August. *Flowers* small, yellow. *Pursh*.

AFZELIA, Sm. Tr. of Linn. Soc. v. 4. 221, so named in honour of its discoverer, Adam Afzelius, M.D. Demonstrator of Botany at Upsal, author of several dissertations on Swedish Roses, and of other learned botanical treatises, is a very noble genus, of which we have long expected from Dr. Afzelius himself an illustration of the species. They are all natives of Sierra Leone.—Class and order, *Decandria Monogynia*. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Juss.

Eff. Ch. Calyx tubular; limb in four deciduous segments. Petals four, with claws; the uppermost very large. Two upper stamens imperfect. Legume with many cells. Seeds with a tunic at the base.

This genus consists of trees with large, smooth, abruptly pinnate, alternate leaves. The flowers are racemose, crimson, with small bractees. Legumes woody and ponderous, smooth, ovate, acute. Seeds near an inch long, parallel, ovate, black, the lower half of each invested with a fleshy tunic, of a brilliant permanent scarlet, and a rather waxy appearance. The native Africans remove this tunic, and use the seeds for beads.

AGASTACHYS, from *αγαστος*, remarkable, and *σπικος*, a spike, alluding to the abundance of its spiked flowers.—

Brown Tr. of Linn. Soc. v. 10. 158. Prodr. Nov. Holl. v. 1. 371.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceæ*, Juss.

Eff. Ch. Corolla regular, of four petals, cohering at the base, bearing the stamens in the middle. Filaments distinct. Nectary none. Germs sessile, triangular, single-seeded. Stigma unilateral.

1. *A. odorata*. Fragrant Agastachys. Br. n. 1.—Found in the southern part of Van Diemen's island, near Adventure bay, by Mr. David Nelson, and afterwards by Mr. George Caley. *A shrub*, perfectly smooth in every part. Leaves scattered, entire, flat. Spikes numerous, simple, terminal, as well as axillary from the upper leaves. Flowers alternate, sessile, with a solitary, hooded, permanent bractea to each. Corolla yellowish, deciduous. Pistil shorter than the stamens. The fruit has not yet been examined. *Brown*.

AGATE, col. 2, l. 15. They are conveyed from Germany in blocks; and cut by means of diamond powder into leaves for making caps for the pivots of mariners' needles, and other purposes.

AGATHARCHUS, in *Biography*, a painter of the life of Samos, who is said to have been instructed by Æschylus in the art of introducing perspective into the decorations of theatres, and to have been the first who wrote on this subject, and communicated the art to Democritus and Anaxagoras.

AGDESTIS, in *Botany*, a fanciful name, adopted by De Candolle, from the authors of an unpublished Mexican Flora, whom he cites as Moç. and Selsé. It is applied to a doubtful genus, related to *Menispermum*, and perhaps a sort of *lusus nature*, having stamens and pistils in the same flower, which is almost unexampled in this tribe. The above denomination is that of a fabulous monster, said to have been male as well as female, and produced by Jupiter from the stone *Agdos*. This genus therefore being not clearly understood, and as yet very little known, may hereafter be abolished as well as its name.—Class and order, *Polyandria Monogynia*. Nat. Ord. *Sarmentaceæ*, Linn. *Menispermæ*, Juss. *Menispermæ*, De Cand.

Eff. Ch. Calyx inferior, of four leaves. Petals none. Filaments thread-shaped. Anthers oblong, cloven at each end, incumbent. Germs and style with four furrows. Stigmas four, spreading. Capsules four, combined.

1. *A. clematidea*. Boverly Agdestis.—Native of New Spain. A smooth shrub, with a branched, twining, round, striated stem. Leaves alternate, distant, stalked, exactly heart-shaped, entire, pointed; their lobes very obtuse. Flowers reddish, corymbose, axillary and terminal; their stalks three-cleft. Fruit unknown. This plant appears very nearly akin to *Clematis*.

AGGREGATE, the title of the 48th order in Linnæus's fragments of a natural system, placed between the *Stellate* and *Compositæ*. (See AGGREGATE.) This is a very miscellaneous and ill-defined order, of which it is by no means easy to seize the idea, much less to give any definition, or distinctive character. Vaillant first laid the foundation of this order, in the *Memoires de l'Acad. des Sciences* for 1722. "The natural order of *Aggregate*," says Linnæus, *Prel. in Ord. Nat.* 528, "was first investigated by Vaillant, in the *Mem. de l'Acad. des Sciences*. They agree with the *Compositæ* in having generally a common calyx as well as receptacle, collecting together many sessile florets, each of which has always an inferior germ. But there is a total difference with respect to the remaining parts of fructification, nor can these two orders be, by any means, united. The calyx, as above said, is common to many flowers,

flowers, or florets. The common receptacle is either naked, villous, hairy, or scaly. In the place of a partial calyx is the corolla, generally monopetalous, either regular or irregular, four-cleft or five-cleft, rarely polypetalous. Stamens four, with separate anthers. Germen inferior (with respect to each floret). Fruit single-seeded. The flower is therefore complete in this tribe, except only *Valeriana*, whose calyx is scarcely apparent. The leaves are often opposite. Stem often shrubby."

The genera which compose this order at the end of *Gen. Pl.* are, Sect. α . *Statice* only. β . *Hartogia*, *Brunia*, *Protea*, *Globularia*, *Leucadendron*, *Hebenfretia*, *Selago*, *Cephalanthus*, *Diplazacus*, *Scabiola*, *Knausia*, *Allionia*. But in his own copy Linnæus has drawn a line between *Selago* and *Cephalanthus*, removing the β to that place, and characterizing his section α "*alternifolia infera*," the remainder of the whole order beginning with *Cephalanthus*, being "*oppositifolia super.*" γ . *Paleriana*, *Morina*, *Boerhavia*, *Circea*, to which *Mirabilis* is added in MSS. δ . *Lonicera*, *Chiocecca*, *Trifolium*, *Mitchella*, *Linnaea*, *Morinda*, *Conocarpus*, *Loranthus*, *Viscum*, to which *Lisianthus* and *Hillia* are added, certainly with no propriety.

This order in fact is not one of our great botanist's most finished or happy performances. It comprehends Jussieu's *Dipsacea*, *Protaceae*, *Caprifolia*, with various solitary genera from different orders. *Statice* was always a stumbling block with Linnæus, nor does it assimilate with any thing among the *Aggregatee*, being itself, however natural a genus, and as we think improperly subdivided by Tournefort and others, composed of species whose inflorescence is essentially different among themselves.

In his manuscripts Linnæus has extended his first section as far as *Selago* inclusive, erasing *Hartogia*, and giving the characters of alternate leaves, and a superior germen to this section. To the second section, which begins with *Cephalanthus*, he attributes opposite leaves, and an inferior germen. He thought *Statice* akin to *Brunia*, and *Protea* the same genus as *Leucadendron*. To his third section he more happily adds *Mirabilis*; but to the fourth he very unfortunately introduces *Lisianthus* and *Hillia*.

The intelligent botanist will without difficulty trace the numerous errors of the above arrangement to various causes. Several natural orders, now well defined, had not entered into the conception of Linnæus, such as the very natural and distinct one of *Protaceae*; and of the *Caprifolia*, sketched in his fourth section, he had evidently but an obscure perception. Of the differences of the *Protaceae* genera he had scarcely any knowledge. That he should not have formed a right idea of *Hebenfretia* and *Selago*, whose affinities are still in some uncertainty, is not wonderful; but they are unquestionably much out of place here. See *DIPSACEÆ* for further observations respecting some of the *Aggregatee*.

AGLABITES, l. 5, add, and governor in Africa, Heg. 184, A.D. 800. This dynasty lasted till the year of the Hegira 296, A.D. 908, and possessed the country which extended from Egypt to Tunis.

AGLAIÀ, in *Botany*, *αγλαία*, splendour and beauty, alluding to the shining verdure of the leaves, and elegance of the whole plant.—Loureir. Cochinch. 173.—Class and order, *Pentandria Digynia*, Lour. (rather perhaps *Pentandria Monogynia*.) Nat. Ord. *Tribilata*, Linn. *Meliæ*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, with five notches, minute, permanent. Cor. Petals five, ovate, concave, fleshy, converging almost closely into the form of a globe. Nectary tubular, with five plates, rather shorter than the petals. Stam. Filaments none; anthers five, ovate, included in the folds of the nectary. Pist. Germen ovate,

superior; style none; stigmas two, oblong, erect. Peric. Berry ovate, smooth, watery, of one cell. Seed solitary, ovate, slightly compressed, with four furrows.

Eff. Ch. Calyx inferior, five-toothed. Petals five, converging in the form of a globe. Berry with one seed.

1. *A. odorata*. Fragrant Aglaia. *Cây ngâu* of the Cochinchinese. (Camunium finæute; Rumph. Amboin. v. 5, 28. t. 18. f. 1.)—Native of Cochinchina and China. Commonly cultivated in the latter country, for the sake of its great beauty and agreeable scent. Rumphius says it was imported from thence to Amboyna, where it still retained the Chinese name of *Tzjulang*, and was continually in leaf and blossom; being easily propagated by cuttings of the larger branches, whose bark must be bruised slightly, and then covered for the space of a month with good earth and dung, till roots are thrown out, which are then to be cut off and transplanted. Loureiro describes this plant as a tree eight feet high, with a yellowish hard wood, thin brown bark, and spreading branches forming a very dense head. Leaves pinnate with an odd one, consisting of three or five oval, entire, smooth, shining leaflets, tapering at the base, on short foot-stalks. Clusters axillary, oblong. Flowers yellow, very minute, globose, odoriferous. Berry small, red.

Rumphius describes the flowers orange-coloured, never producing fruit in Amboyna.

We cannot find that this plant of Rumphius is taken up by any author, nor is his description sufficient to procure it a place in any systematic work. Loureiro, however, has furnished us with sufficient characters to enable us to judge of its natural order, and to determine that it is not, as he suspected, the same genus with Thunberg's *Bumalda*.

AGNES, Sr., l. ult., for E. r. N.

AGNESI, MARIA GÆTANA. See GÆTANA.

AGRA, col. 2, l. 3, r. N. lat. 27° 15'. E. long. 78° 28'.

AGRICULTURE, col. ult., after See BOARD of AGRICULTURE, add and SOCIETY.

AGRIPHYLUM, in *Botany*, so called by Jussieu, from *αγρα*, the holly, and *φυλλον*, a leaf, because its sinuated prickly leaves resemble that shrub. Juss. Gen. 190. See *BERCKHEYA* hereafter.

AGUJARI, LUCRETIA. See *FILER un Sen*.

AGUILLAS, CAPE. *Dele Cape NEEDLES*.

AGUILLAS Bank, a bank on the southern coast of Africa, stretching from Cape Point across the entrance of False bay to the mouth of Rio Infanta, or Great Fish River, and to the 37th parallel of Southern latitude. Mr. Barrow conjectures that this bank at one time formed a part of the continent.

AHM, in *Commerce*. See *STUBGEN*.

AHMEDABAD. For AGMED'S r. AHMED'S; l. 6, r. Sebermathy.

AHMEDNAGUR, l. 2, r. Dowlatabad.

AHOUAS. Add—This was once a large and flourishing city, the capital of a province of the same name, and the winter residence of Artabanus, the last of the Parthian kings; but it is now a wretched town, containing 600 or 700 inhabitants, and situated on the banks of the river Karoon; 48 miles S. of Shuster.

AIDAN, col. 2, l. 18, for bishop r. king.

AIDERBEITZAN. At the close add—It is separated from Armenia by the river Araxes, and from Irak by the Kizilozoin, or Golden stream. This province, including Erivan with the Karabag and Karadag, is divided into twelve districts, viz. Urumea, Ardebil, Tabreez, Maraga Khoee, Kulkham, Serab, Gumrood, Sa Bulagh, Karadag, Erivan, Nuckhivan, and Miskeen, yielding a revenue of 89,405 tomanas. The most picturesque, and at the same time most

flourishing division of Aiderbeitzan, or Azerbaijan, lies along the N. and W. borders of the lake Urumea from Tabreez to the confines of Armenia, in which direction are the towns of Shebuser, Tafoui (in ruins), Selmaft, Khoea, and Urumea.

AIDIA, in *Botany*, a genus of Loureiro's, unknown to us but from his description, whose name, from *aidios*, *eternal*, alludes to the indestructible nature of the wood.—Loureir. Cochinch. 143.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Capprifoliæ*, Juss.

Gen. Ch. *Cal.* Perianth superior, tubular, five-toothed, erect. *Cor.* of one petal, falver-shaped; mouth of the tube woolly; limb in five deep lanceolate segments. *Stam.* Filaments none; anthers five, linear, inserted into the corolla between its segments. *Pist.* Germen ovate, inferior; style on a level with the anthers; stigma ovate-oblong. *Peric.* Berry ovate, "calycine," (meaning crowned by, and confluent with, the calyx,) small, umbilicated, of one cell. *Seed* solitary, ovate.

Eff. Ch. Corolla falver-shaped, woolly in the throat. Anthers linear, sessile between the segments of the corolla. Berry calycine, single-seeded.

1. *A. cochinchinensis*. Everlasting-wood. *Cây Thai* of the Cochinchinese.—Native of Cochinchina. A large tree, with spreading branches. Leaves opposite, lanceolate, entire, smooth. Flowers white, in short, lax, axillary clusters. The wood is white, heavy, composed of thick fibres, and not handsome. Its chief use is for building the lower parts of houses, and foundations of bridges, being extremely durable, either under ground or in water. *Loureiro*.

AIMONTE. Add, See **AYEMONTE**.

AINSWORTH, ROBERT, l. 2, for *Woodyale* *r.* *Woodyate*.

AIR, cor. 11, l. 44, insert elastic, and *r.* whatever elastic matter, &c.

AIR, *Atmospheric*, in *Chemistry*. The most recent experiments shew that atmospheric air is composed by bulk of about 21 *per cent.* of oxygen and 79 *per cent.* of azote; and this coincides so nearly with four volumes of azote and one of oxygen, that Dr. Prout has been induced to consider this proportion as the true composition of atmospheric air, and consequently that it is a real chemical compound composed of one atom oxygen and two of azote. Upon this supposition, and the supposition that the atom of oxygen be 10 and the atom of azote be 17.5, atmospheric air will be composed by weight of

$$\begin{array}{l} \text{Oxygen } 22.22 \\ \text{Azote } 77.77 \end{array} \left. \vphantom{\begin{array}{l} \text{Oxygen } 22.22 \\ \text{Azote } 77.77 \end{array}} \right\} \text{ and by bulk of } \left. \begin{array}{l} 20 \\ 80 \end{array} \right\}$$

And the specific gravity of oxygen gas will be 1.1111 and of azote .9722, atmospheric air being 1.000. See **ATOMIC Theory**, *Addenda*.

The reasons upon which the above opinion is chiefly founded are, in the first place, the impossibility of accounting on any other than chemical principles for the remarkable uniformity observed in the composition of atmospheric air all over the world. This fact is universally admitted, and no one can adduce even the slightest argument why this uniformity should be explained on principles different from those which govern other definite compounds, as, for example, water.

Secondly, experiment coincides extremely near with the above supposition, perhaps as nearly as it has ever done in any similar example, even in those on which the doctrine of volumes itself was founded by M. Gay Lussac. Those versed in eudiometry, and who know the imperfections of all eudiometrical methods hitherto advanced, will feel little inclined to vouch

for the *perfect* accuracy of their results, and to deny the possibility of an error of one *per cent.* Besides, when we reflect how liable the atmosphere is to contaminations of every kind, the chance of such an error is still further increased.

About the same time (November 1815) that the above opinion was advanced by Dr. Prout, a similar opinion was published by Doberceiner, in a paper inserted in Schweigger's Journal. Thomson's Annals of Philosophy, vol. vi. p. 321.

AIR, in *Music*, l. 5, for rhyme *r.* rhythm.

AIR-Lamp, cor. 2, l. 4, for driven *r.* drive it.

AIR-Pump, *Laws of Rarefaction*, &c., cor. 4, l. 11 from the bottom, add—Some of the experiments above recited, as having been made in *vacuo*, would only succeed in a very imperfect state of exhaustion, as is evinced from other experiments detailed in the sequel of the article.

AIR,—Experiments for shewing the elasticity or spring of the air, cor. 2, exp. 6, add to square phial A, of thin glass. —Miscellaneous experiments, N^o 5, l. ult., *r.* it will not be extinguished.

AIR, in *Geography*, a township of Pennsylvania, in the county of Bedford, containing 1179 inhabitants.

AIRY. See **AERY**.

AITZEMA, l. 2, *r.* Dockum.

AKISKA, in *Geography*, one of the Turkish pachalics of Armenia, which lies near the limits of the Turkish empire, and has the Black sea to the W., Immeritia to the N., Kars and Erzeroom to the S., and Georgia to the E. It extends a considerable way along the banks of the Kur, and contains much arable land, with many cities and villages, and minerals in its mountainous parts. Akalzike (new Castle) or Akiska, which gives name to the province, is the capital: it is a populous and commercial city, without walls or fortifications, and only defended by a ruined citadel, standing in an open valley on the left bank of the Kur, and inhabited by Jews, Turks, Greeks, Armenians, and Georgians.

ALA, in *Botany, l. 4, for upwards *r.* downwards.*

ALANGIUM, so denominated by Lamarek, by a slight alteration of one of its Malabar names, *Alangi*; and if any barbarous generic appellations are to be tolerated, this certainly may.—Lamarck Dict. v. 1. 174. Juss. Gen. 323. Vahl Symb. v. 2. 61. Willd. Sp. Pl. v. 2. 1174. Ait. Hort. Kew. v. 3. 302.—Class and order, *Icosandria Monogynia*. Nat. Ord. *Hesperideæ*, Linn. *Myrti*, Juss.

Gen. Ch. *Cal.* Perianth superior, of one leaf, short, permanent, with from six to ten small erect teeth. *Cor.* Petals from six to ten, linear, undivided, much longer than the calyx into which they are inserted, spiral in the bud, afterwards recurved. Nectary cup-shaped. *Stam.* Filaments ten or twelve, inserted into the calyx, erect, thread-shaped, hairy below, scarcely half the length of the petals; anthers terminal, vertical, linear, obtuse, rather broader and longer than the filaments, bursting at each side longitudinally. *Pist.* Germen turbinate, inferior; style cylindrical, erect, rather longer than the stamens; stigma capitate, lobed, very large. *Peric.* Berry globular, with a rather coriaceous coat; crowned with the calyx, internally fleshy, of one cell. *Seeds* from one to three, nearly lenticular.

Eff. Ch. *Cal.* nearly superior, with from six to ten teeth. Petals from six to ten. Berry coated, of one cell, with few seeds.

Obf. We do not scruple to remove this genus from the class *Polyandria*, where Willdenow has placed it, but with which the insertion of the filaments does not agree, to *Icosandria*, where it ranges with its natural allies. **LEMNISCIA** (see

(see that article) answers in habit, and in several characters, to *Alangium*; but its fruit is not sufficiently known to allow of an absolute decision, nor do the anthers agree.

1. *A. decapetalum*. Sage-leaved Alangium. Lamarck n. 1. Willd. n. 1. Ait. n. 1. Vahl Symb. v. 2. 61. (*Grewia salvisolia*; Linn. Suppl. 409. Angolam; Rheede Hort. Malab. v. 4. 39. t. 17. Arbor indica baciferia, fructu umbilicato rotundo, cerasi magnitudine diocoq; Raii Hist. v. 2. 1497.)—Flowers with ten petals. Branches becoming spinous.—Native of the East Indies. Koenig sent specimens to Linnæus, and in the year 1779 he also communicated seeds from Ceylon to Kew garden; and their progeny has not yet flowered, if it be still alive. Rheede describes this as a handsome tree, an hundred feet high, and twelve in circumference, with spreading branches, white hard wood, and a bitterish, acrid, aromatic bark. The root is fungous, reddish, fragrant and bitter, with a yellowish bark. The branches bear leaves and flowers together, and finally assume a sharp spinous termination. Leaves alternate, on short downy stalks, ovate-oblong, obtuse, entire, ribbed, veiny, four or five inches long, pliant, fragrant; smooth and shining above; paler, reticulated, and roughish, beneath. Flowers axillary, either solitary, or two or three together, on simple, short, downy stalks. Calyx downy. Petals rather silky externally; white within. Anthers bright red. Fruit the size of a large cherry; downy when young; purplish when ripe, full of sweet fragrant pulp, which is esteemed very delicious, and contains one, two, or three black seeds. The inhabitants of Malabar compare the flowers to an imperial diadem, and therefore consider this tree as an emblem of royalty. The expressed juice of the root is purgative, and used for expelling intestinal worms. Its powder is thought an antidote for the bites of serpents, and other venomous animals.

2. *A. hexapetalum*. Broad-leaved Alangium. Lamarck n. 2. Willd. n. 2. Vahl Symb. v. 2. 62. (Kara Angolam; Rheede Hort. Malab. v. 4. 55. t. 26. Arbor indica prunifera, fructu umbilicato corticose perfici simili; Raii Hist. v. 2. 1493.)—Flowers with six petals. Branches not spinous.—Native of the coast of Malabar, in stony, sandy, mountainous places, always in flower and leaf. Its trunk is of lofty stature, but inferior to the former. Leaves broader, more ovate, and pointed, smooth, bitter and acrid, but not aromatic; paler beneath. Flowers smaller, whitish, nearly sessile, with only six petals. Fruit globose, the size of a small apple, having a thick, downy, purple coat, and viscid acid pulp.

3. *A. tomentosum*. Downy Alangium. Lamarck n. 3.—“Branches scarcely spinous. Leaves oblong, blunthigh; their ribs downy beneath, like the footstalks.”—Found in the East Indies by Sonnerat. Allied to the first species in the form of its leaves, and to the second in the nature of its fruit. The flowers are unknown. The young shoots, stalks, calyx, and ribs of the leaves, are clothed with short cottony down. Lamarck.

AL-ARAF, l. 5, for Alcoran r. Koran.

ALASAN, in *Geography*, the *Ausan* of Strabo, a river of Georgia, which separates this province from Shirvan, and taking its rise near that of the Araxi, not far from the gates of Caucasus, pursues a S.E. course, until it meets the Kur or Cyrus at Douthizil. About 30 miles above this place it is joined by the Kabri or Yari, which fertilizes the greatest part of the province of Kaketi.

ALBA LONGA, l. 8, for furrowed r. farrowed.

ALBANIA, col. 2, l. 5, add—Mr. Houboeuf rates the population of Albania at about 1,200,000 souls.

ALBANS, Sr., a township of America, l. 3, for 256 r. 1669.

ALBANY. Add after Saratoga—It is now restricted to an area of 462 square miles, or 295,689 acres. By the census in 1810, its population consisted of 34,661 souls, its senatorial electors were 2971, and the number of slaves was 772.

ALBANY, l. 4. This city and suburbs in 1812 contained about 12,000 inhabitants, 1800 houses and stores, 10 houses for public worship, and several public buildings.

ALBANY, a township of the district of Maine, in the county of Oxford, with 165 inhabitants.

ALBEMARLE, a county of America, &c. contained, in 1810, 18,268 inhabitants, of whom 9226 were slaves.

ALBERT I., l. 9, for between r. with. Col. 2, l. 11 from the bottom, for Rhees r. Reus, and *dele* near Schaffhausen.

ALBERT's or Current Dollar, with $\frac{1}{2}$ and $\frac{1}{4}$ ditto, Dutch silver coins valued at 50, 25, and 12 $\frac{1}{2}$ stivers, each about 1 per cent. agio. Albert's dollar is also used as a money of account at Riga. See RIX-DOLLAR.

ALBUMEN, in *Chemistry*. Considerable additions have been made to our knowledge respecting this important animal principle since the first volume of the Cyclopædia was published. These we shall briefly notice here.

The first thing deserving to be mentioned is the distinction between *coagulation*, *gelatinization*, and *precipitation*, terms which had been always confounded till Dr. Boileau defined their difference. By *coagulation* is now understood the passing of a substance from a fluid to a solid state by the agency of heat only, or, in some instances, without the immediate co-operation of any external agent; as, for example, in the *coagulation* of the fibrin of the blood. *Gelatinization* is the property which a warm solution of jelly possesses of becoming concrete as it cools. *Precipitation* is the effect which different substances or re-agents produce by combining and forming solid compounds with the principles operated upon.

The next circumstances deserving of notice are the effects of galvanism upon albumen, as ascertained by Mr. Brande.

Mr. Brande found, that when albumen was exposed to the action of a galvanic battery, an apparent coagulation took place at the negative pole, as well as at the positive. The effects of this agent, however, were different, according to its intensity. Thus, with a comparatively high power, the coagulation went on rapidly at the negative pole, and slowly at the positive; whereas, with a very low power, the coagulation was comparatively rapid at the positive pole, while at the negative pole no coagulation took place, the small proportion of albumen being retained in solution by the alkali attracted thither. Dr. Murray, however, who saw these experiments repeated in a general manner by Mr. Ellis, thinks that Mr. Brande was deceived, and that the appearance of coagulation was produced only from the numerous aerial bubbles entangled in the viscid albumen.

The opinion entertained by chemists at present respecting the coagulation of albumen, does not differ much from that of Bucquet, who considered it as a sort of soap, the animal matter being retained in solution by the soda present. An opinion, closely resembling this, has been successfully advanced by Dr. Thomson, Sir Humphry Davy, and Mr. Brande, who appear to consider this albumen as merely a solution of an animal matter in water and soda, and that all the agents known to coagulate or precipitate it, act by abstracting the soda and water.

The effects of acids and other re-agents upon albumen, although they have been mentioned in a general manner in the

the Cyclopædia, deserve to be more fully detailed here, as much additional light has been thrown on the subject within the last few years, from the labours of Berzelius and others.

Acids, as is well known, precipitate albumen immediately; at least this is the case with all the mineral acids when concentrated. Dilute phosphoric, fluoric, and acetic acids, however, do not precipitate albumen. Coagulated albumen, according to Berzelius, is charred by concentrated sulphuric acid; but when diluted with six or seven times its weight of water, and digested with it, the acid assumes a reddish colour, but dissolves scarcely any thing. The portion not dissolved he considers as a compound of albumen with excess of acid. On depriving it of this excess of acid, by washing it with pure water, a neutral combination is obtained, which is soluble in water. This solution reddens litmus paper, and yields a precipitate with acids as well as alkalies, the former being combinations of the albumen with the acid employed, and which may be again rendered soluble by washing in water, the latter being again soluble with a slight excess of alkali. Hence he considers sulphuric acid to be capable of combining with albumen in two proportions; one in which the acid is neutralized, and which is soluble in water; the other, in which the acid is in excess, and which is insoluble in water. In dilute muriatic acid scarcely any of the albumen is dissolved, even by boiling, neither does the acid liquor afford any precipitate with ammonia, or prussiate of potash. Evaporated to dryness, a brownish residue is obtained, from which potash disengages a little ammonia. Concentrated muriatic acid decomposes albumen by boiling, and produces a red or violet-coloured solution. The albumen that has been digested in weak muriatic acid, by washing repeatedly with water, is converted into a gelatinous mass, which is perfectly soluble in tepid water: this is to be considered as a neutral combination of albumen with the acid, while the former one contains an excess. The solution has the same properties nearly as that of sulphuric acid above-mentioned. Nitric acid of sp. gr. 1.25, digested with albumen, renders it yellow, and diminishes its cohesion. The fluid becomes yellow, and a small quantity of fatty matter is formed. During this process, azotic gas is given out in abundance. After twenty-four hours, the albumen is converted into a pulverulent mass of a pale citron colour, which is deposited at the bottom. This matter being separated and well washed acquires a deep orange colour, which Berzelius considers as the *acide jaune* of Fourcroy and Vauquelin, who obtained it by digesting muscular flesh with nitric acid. This is soluble in alkaline leys, and imparts to them an orange colour; and it is also soluble in acetate of potash and soda. Thus, according to Berzelius, albumen is capable of existing with the nitric acid, as well as with the other acids, in two distinct states of combination, the one having an excess of acid, and of a pale yellow colour, and the other neutral, and of an orange hue. Berzelius seems to consider the different nature of the compounds formed with nitric acid to depend upon the formation of the malic acid, by the action of the nitric acid upon the albumen, which at the same time combines with it. Hence, in his opinion, they are triple compounds of albumen, nitric and malic acids. Mr. Hatchett found, that if albumen, after being steeped in diluted nitric acid, be washed, and then boiled in water, it is dissolved, and forms a pale yellow liquid, which gelatinizes when properly concentrated, and has all the properties of gelatine. Perhaps this boiling deprives it of the malic acid above-mentioned, or perhaps the malic acid was not formed by the dilute nitric acid; for Berzelius, who seems not to have been acquainted with this fact, found also, that when

albumen was precipitated from its solution in acetic acid by the nitric acid, the yellow precipitate was rendered gelatinous by washing, and soluble in water, like the compounds of albumen with the other acids above-mentioned; all which compounds are probably similar to the above, and which was considered by Mr. Hatchett as gelatine. The acetic acid readily dissolves albumen by the assistance of heat, first converting it, if previously coagulated, into a tremulous jelly. The solution is colourless, and of a mawkish and slightly acid taste. When sufficiently evaporated, it again becomes gelatinous; and when completely exsiccated is a transparent mass which reddens litmus, but is insoluble both in hot and cold water, without a fresh addition of acetic acid. Ammonia and prussiate of potash produce from this solution in acetic acid a whitish precipitate. Alkalies also produce a precipitate which is again dissolved on their being added in slight excess. Sulphuric, muriatic, and nitric acids produce precipitates, which are compounds of the albumen with the acid employed, the acid being in excess; hence, if they are washed in water, as before observed, they become neutral, and capable of solution in water, like gelatine.

Solutions of the different earths, and even some of their salts, as alum, sulphate of magnesia, and silicated potash, were found by Dr. Thomson to have no effect upon albumen when dissolved in water, in the proportion of one white of an egg to a pint of water. The case, however, was very different with the metallic salts and oxyds, most of which were found to have a powerful effect upon it, especially the sulphates, muriates, and nitrates of the metals, while the prussiates, and one or two others, had no effect. One of the most delicate tests of albumen, according to Dr. Boissac, is a solution of oxy muriate of mercury: a single drop of this, let fall into water, containing only $\frac{1}{10000}$ parts of its weight of albumen, produces an evident milkiness, and a curdy precipitate falls. Heat renders the operation of this test more effectual. Perhaps the test of albumen least liable to ambiguity, is that recommended by Berzelius above-mentioned; namely, the addition of the prussiate of potash to a solution of albumen in acetic acid. Albumen is composed of hydrogen, carbon, oxygen, and nitrogen or azote, in the proportions, according to the experiments of Gay Lussac and Thenard, of

Hydrogen	- -	7.540
Carbon	- -	52.883
Oxygen	- -	23.872
Azote	- -	15.705

100.000

Albumen never exists in an absolutely pure state in animal bodies, but is always combined with other animal matters, and various salts. See BLOOD and Animal FLUIDS.

ALBURGH, in *Geography*, a town of America, in Vermont, and county of Grand Isle, containing 1106 inhabitants.

ALBUS, in *Commerce*, a small coin and money of account at Cassel, Cologne, and other places in Germany. The whole principalty of Hesse keeps accounts in rix-dollars of 32 albuses, subdivided into 9 pfennings, or 12 hellers current. A specie rix-dollar is worth $42\frac{2}{3}$ Hessian albuses. Coins in silver are, pieces of 8, $5\frac{1}{2}$, 4, 2 $\frac{1}{2}$, and 1 $\frac{1}{2}$ albuses; and in copper, pieces of 1 and 2 albuses. Cologne keeps accounts in rix-dollars specie of 80 albuses;

or six-dollars current of 78 albufes; the albus being reckoned at 12 hellers: and albufes are silver coins.

ALCEDO *Copenfis*, l. 2, for short-tailed *r.* long-tailed. *A. rudis*, l. 3, *r.* long-tailed.

ALCEDO. Add.—Dr. Shaw has described some other species, and referred some of those above-mentioned to other titles under *Alcedo*, and to *Galbula*. The *A. gigantea* is the *fusca* above-named; the *afra* is the *maxima*: the *amazona* is glossy-green, white beneath; the sides of the neck white; those of the body variegated with green, and the wing and tail feathers spotted with white; the amazonian K. of Latham, about the size of the belted K., or *A. alycon*: a native of Cayenne. *A. Malimbica*, sea-green or beryl K. with the throat and belly white; the wing-coverts and streak across the eyes black: is much allied to the *A. capensis* in the form of its belt and distribution of its colours; numerous in Malimba, about the sea-coasts, feeding on worms and fish. *A. javanica*, blue K., with sea-green back, yellowish-white head, neck, and body; the crown of the head streaked with black. (See *A. leucocephala*.) *A. canerophaga*, greenish-blue K., yellowish beneath, with black wing-coverts and eye-stripe, and ferruginous bill; crab-eating K. of Latham: native of Senegal, where it is called Crab-cater. (See *A. Senegalensis*.) *A. Goromanda*, pale-violaceous rose-coloured K., rufescent beneath, with the rump marked by a longitudinal blueish-white band, and white throat: a native of Coromandel, an elegant species. *A. collaris*, blue-green K., white beneath, with white collar; Latham's variety of *A. facra*: a native of the Philippine islands. *A. bicolor* of Gmelin, referred to *A. inda*. *A. capistrata*, white-collared K. of Latham. (See *A. cerulea* above.) *A. albivertis* referred to GALBULA. *A. cyanoccephala*, described under *A. ceruleocephala*. *A. tribrachys*, tridigitated K. of Nat. Misc., deep-blue K., ferruginous beneath, with blackish wings and three-toed feet; a native of New Holland: to this the azure K. of Latham is much allied.

ALCINA, in *Botany*, Cavan. Ic. v. 1. 10. t. 15, fo named by that author, in memory of Francis Ignatius Alcina, a learned Spanish Jesuit, who resided long in the Philippine islands, and devoting his leisure hours to natural history, left a folio MS., of which Cavanilles speaks as likely to be published. This supposed genus, however, is now sunk in WEDELIA; see that article.

ALCOHOL, in *Chemistry*. A new analysis of alcohol has been lately published by M. de Sauffure. He employed for his analysis alcohol of the sp. gr. .8302, at the temperature of 62.8, obtained by rectifying common spirits. This alcohol he considered as a compound of 13.8 water, and 86.2 of the Richter's absolute alcohol; and the water being subtracted from the products obtained, the residue gave the composition of the absolute alcohol of Richter. His method of analysis was to pass the vapour of alcohol through a red-hot porcelain tube, and along a glass tube surrounded by ice nearly six feet in length. The products were carefully collected and weighed. There was a little charcoal deposited in the porcelain tube, and a very little oil in the glass tube. The water obtained amounted to $\frac{1}{4}$ of the weak alcohol employed, which was 1256.7 grs., and it contained $\frac{1}{4}$ of its weight of absolute alcohol. The combustible gas weighed 912.3 grs., and there was a loss of 55.82 grs. The gas was proved to possess the properties of olefiant gas. Hence it follows that alcohol may be considered as composed of olefiant gas and water; and the result of the analysis was, that the absolute alcohol of Richter is composed of

Hydrogen - - -	13.70
Carbon - - -	51.98
Oxygen - - -	34.32
	<hr/>
	100.00

Or the composition may be stated thus:

Olefiant gas - -	61.63
Water - - -	38.37
	<hr/>
	100.00

If, with Dr. Thomson, we suppose alcohol to be a compound of one volume of olefiant gas, and one volume of vapour of water, condensed into one volume, its specific gravity in a state of vapour will be just equal to that of these two elastic fluids added together. The specific gravity of these two bodies is,

Olefiant gas - -	.974
Vapour of water - -	.625
	<hr/>
	1.599

And M. Gay Lussac determined by experiment the specific gravity of the vapour of alcohol to be 1.613, which very nearly coincides with the above. Hence there is every reason for presuming that the above is the true composition of alcohol, which, stated more correctly on this supposition, will be as follows:

3 atoms hydrogen - -	3.75
2 atoms carbon - -	15.
1 atom oxygen - -	10.
	<hr/>
	28.75

Or per cent. of

Hydrogen - - -	13.04
Carbon - - -	52.17
Oxygen - - -	34.79
	<hr/>
	100.00

Or,

Olefiant gas - -	60.86
Vapour of water - -	39.14
	<hr/>
	100.00

See FERMENTATION, *Addenda*.

ALCOHOL of Sulphur, now generally termed *sulphuret of carbon*, is a curious compound of sulphur and carbon, first described by Lampadius. See CARBON, and particularly SULPHUR, in the Cyclopædia; where the recent experiments of Berzelius and Dr. Marcet on this substance are detailed.

ALDRICH, col. 2, l. 5, *r.* ascribed to him, but, as some say, erroneously.

ALE, col. 2, l. 28, after parliament, add—The gross duty on ale, or strong beer, is 10s. per barrel, with an allowance of 10d., so that the nett duty is 9s. 2d. For table-beer not worth more than 24s. the gross duty is 2s. per barrel, with an allowance of 2d., so that the nett duty is 1s. 10d.

By 48 Geo. III. c. 143. the several duties imposed upon ale-

ale-licences by former acts were repealed, and a new duty of 2*l.* 2*s.* imposed. All persons who shall sell ale or beer by retail, or shall sell cyder or perry, to be consumed in their houses or premises, shall first take out an excise-licence, within the limits of the chief office of excise in London, under the hands and seals of two or more of the commissioners of excise in England, or of such persons as they, or the major part of them, shall appoint for that purpose: and in other parts of England, the licences are to be granted under the hands and seals of the several collectors and supervisors of excise within their respective districts. The duration of such licences is limited to the 10th of October next ensuing the time of granting thereof. All licences granted at the general licensing day shall be made for one year only, to commence on the 29th day of September.

ALE-Houses, l. 4, after houses, add—under penalty of 3*l.* 6*s.* 8*d.* 5 & 6 Ed. VI. c. 25. 26 Geo. II. c. 31.

L. 9, after cofts, add—But no person shall be liable to the said penalty, for selling ale or beer in casks containing not less than five gallons, or in bottles, not less than two dozen quarts, not to be drank in his house, out-house, yard, garden, orchard, or other place. 38 Geo. III. c. 54. Penalties may be mitigated for the first offence; and all penalties shall be sued for and determined within six months after the offence committed.

L. 15, after only, add—The day and place for granting licences shall be appointed by two or more justices for the division, by warrant under their hands and seals, at least ten days before such meeting, directed to the high constables, requiring them to order their petty constables, or other peace officers, to give notice to the several inn-keepers and alehouse-keepers within their respective constablewicks, of the day and place of such meeting: and all licences granted at any other time and place shall be void. And no licence shall be granted to any person not licensed the year preceding, (except in cities or towns corporate,) unless he produce a certificate under the hands of the minister and the major part of the churchwardens and overseers, or else of three or four reputable and substantial householders of the place, setting forth that such person is of good fame and of sober life and conversation; and it shall be mentioned in such licence that such certificate was produced, otherwise the licence shall be void. No justice of the peace, being a common brewer of ale or beer, inn-keeper, or distiller, or a seller of and dealer in ale or spirituous liquors, or interested in any of the said trades, or being a victualler or maltster, shall be capable or have any power to grant licences for selling ale or beer, or any other liquors, but the same shall be void. All mayors, town-clerks, and other persons whom it may concern, shall make out ale-licences duly stamped before the recognizance be taken; on pain of 1*l.*, half to the king, and half to the prosecutor, with cofts. 6 Geo. c. 21. 1 Ann. stat. 2. c. 22.

L. 18; after tipping, &c. add—1 Jac. c. 9. 1 Ch. c. 4. By 21 Jac. c. 7. innkeepers who suffer tipping are disabled from keeping an ale-house for three years. By 30 Geo. II. c. 24. if any person licensed to sell any sorts of liquors, or who shall sell or suffer the same to be sold in his house, out-house, ground, or apartment thereto belonging, shall knowingly suffer any gaming with cards, dice, draughts, shuffle-boards, mississippi, or billiard-tables, skittles, nine-pins, or with any other implement of gaming in his house, out-house, ground, or apartment thereto belonging, by any journeymen, labourers, servants, or apprentices, and shall be convicted thereof on confession, or

oath of one witness, before a justice, within six days after the offence committed; he shall forfeit for the first offence 40*s.* and for every other offence 1*l.* by distress by warrant of such justice; three-fourths of which shall be to the churchwardens for the use of the poor, and one-fourth to the informer.

And if any journeyman, labourer, or apprentice, or servant, shall game in any house, out-house, ground, or apartment thereto belonging, wherein any liquors shall be sold, and complaint thereof shall be made on oath before one justice where the offence shall be committed, he shall issue his warrant to the constable or other peace-officer of the place wherein the offence is charged to have been committed, or where the offender shall reside, to apprehend and carry the offender before some justice of the place where the offence shall be committed, or where the offender shall reside; and if such person shall be convicted thereof by the oath of one witness or confession, he shall forfeit not exceeding 20*s.* nor less than 5*s.* as the justice shall order, every time he shall so offend, and be convicted as aforesaid, one-fourth to the informer, and three-fourths to the overseers for the use of the poor; and if he shall not forthwith pay down the same, such justice shall commit him to the house of correction, or some other prison of the place where he shall be apprehended, to be kept to hard labour for any time not exceeding one month, or until he shall pay the forfeiture.

If any person (allowing for some excepted cafes under 1 J. c. 9.) shall continue drinking or tipping in any inn, victualling-house, or ale-house, he shall on conviction thereof before a mayor or justice of the peace on view, confession, or oath of one witness, forfeit for every offence 3*s.* 4*d.*, to be paid within one week next after the conviction to the churchwardens, who shall be accountable for the same to the use of the poor; and if he shall refuse or neglect to pay the same, it shall be levied by distress. And if he be not able to pay the forfeiture, then the mayor, justice, or court where the conviction shall be, may punish the offender, by setting him in the stocks for every offence by the space of four hours. 1 J. c. 9. 4 J. c. 5. f. 4. 21 J. c. 7. f. 2. 1 C. c. 4.

If any alehouse-keeper shall be convicted of the said offence, he shall moreover for the space of three years be disabled to keep any such ale-house. 7 J. c. 10. 21 J. c. 7. f. 4.

ALECTORIA, in *Botany*, seems to derive its name from *αλεκτος*, unmarried, because nothing has been made out respecting the male flowers. This is one of the tribe of filamentous Lichens, established as a genus by Acharius, (see LICHENS), and we shall endeavour to explain its characters.—Achar. Syn. 291. Lichenogr. t. 13. f. 1.—4. Sin. Prodr. Fl. Græc. Sibth. v. 2. 323.—Class and order, *Cryptogamia Alga*. Nat. Ord. *Lichenes*.

Eff. Ch. Frond cartilaginous, branched; spongy within. Shields sessile, thick, bordered, flattish, of the substance of the frond; their disk slightly coloured.

1. *A. jubata*. Wiry Alectoria, or Rock-hair. Achar. n. 1. Prodr. Fl. Græc. n. 1. (*Parmelia jubata*; Achar. Meth. 219. Lichen jubatus; Linn. Sp. Pl. 1622. Achar. Prodr. 279. Westring Lich. 183. t. 14. Engl. Bot. t. 1880. Schrad. Journ. v. 1. 83. t. 3. f. 4. *Ufnea jubata nigricans*; Dill. Mufc. 64. t. 12. f. 7.)

2. *Lichen chalybeiformis*; Linn. Sp. Pl. 1623. Achar. Prodr. 220. (*Ufnea rigida, horum-vorsum extensa*; Dill. Mufc. 66. t. 13. f. 10. *Parmelia jubata* ð; Achar. Meth. 273.)

Frond thread-shaped, smooth, very much branched, of a smoky-

a smoky-brown; branches capillary, compressed at their subdivisions. Shields sessile, blackish, with an entire margin; at length convex and rugged. Warts tumid, powdery, white.—Found on the trunks and branches of old trees, especially of the fir kind, throughout Europe, from Lapland to the Bithynian Olympus. β . On pales, rocks, and stones. The shields are extremely rare. The older specimens hang in long blackish tufts, like the mane of a horse, from aged trees in mountain forests; the variety β grows prostrate and entangled. There is no central fibre, the inside being hollow, or slightly spongy. White powdery warts are frequent and conspicuous on the pendulous variety, but these are not now considered by Acharius as having any share in the fructification. The matter has not been decided either way by sufficient experiments. The learned author, whom we have just named, reckons up four more varieties, by the names of *capillaris* (which is *Lichen foetiformis* of Ehrhart); *lanuginis*; *cana* (figured by Westring above cited, at his t. 14. f. B.); and *setacea*. These we have not examined. The *cana*, which is hoary, with pale flesh-coloured shields, appears to have some claims to specific distinction.

2. *A. crinalis*. Mane Alecatoria. Achar. n. 2. Lichenogr. 594.—“Fronde slightly compressed, much branched, greyish, very brittle; branches thread-shaped, roundish towards the upper part. Shields? convex, brown.”—Found often mixed with other filamentous Lichens, on the trunks and branches of trees. Acharius.

3. *A. usneoides*. Flattened Alecatoria, Arabian Usnea. Achar. n. 3. (*Parmelia usneoides*; Achar. Meth. 270. Lichen Usnea; Linn. Mant. 131. Swartz Ind. Occ. 1912. Usnea ceratoides candicans, glabra et odorata; Dill. Musc. 71. t. 13. f. 14? and certainly t. 84. f. 10.)—Fronde compressed, flat, longitudinally striated, much branched, pale and whitish; the branches somewhat fibrous. Shields flat, entire, of the same colour.—On trees in warm countries, in Asia, Africa, and America. Generally pendulous, always spreading, from six to eighteen inches long, linear, flat, cream-coloured, very smooth to the touch; fragrant and musky when fresh; easily splitting when old and dry into two flat layers, exposing a pure white internal powder. The shields are very small. By age the whole becomes of a dirty-buff colour. The Arabian physicians used this moss as a cordial, and thought it also procured sleep. See our n. 6.

4. *A. farmentosa*. Trailing Alecatoria. Achar. n. 4. (*Parmelia farmentosa*; Achar. Meth. 271. Lichen farmentosus; Achar. Prodr. 180. New Stockh. Transf. v. 16. 212. t. 8. f. 2. Schrad. Journ. v. 1. 83. t. 3. f. 4. Engl. Bot. t. 2040. L. longifilium, ex cinereo candicans, rugosus et mollior, receptaculis florum rufescentibus; Mich. Gen. 77. t. 39. f. 2. Usnea loris longis dichotomis, extrematibus tenuioribus; Dill. Musc. 59. t. 11. f. 2. U. dichotoma; Hoffm. Pl. Lich. t. 72.)—Fronde roundish, somewhat angular and pitted, much branched, forked and divaricated, whitish; ultimate branches capillary and lax. Shields livid, rather concave, with a pale entire border.—Native of mountainous tracts in various parts of Europe, on trees or rocks. Mr. Borrer and Mr. Hooker met with it on the mountains of Inverness-shire in 1808. The fronds are of an ivory white, creeping, widely divaricated, sometimes powdery, hollow; their ultimate branches peculiarly fine and numerous. Shields, communicated by Dr. Acharius, small, with a greenish flesh-coloured hollow disk, finally becoming flattened and dilated.

5. *A. thrausta*. Brittle Alecatoria. Achar. n. 5. Lichenogr. 596.—“Fronde round, somewhat compressed, branched,

white; black at the base; branches unequal, zigzag, minutely fibrous and somewhat tendril-like.”—Native of France and Switzerland. Acharius.

6. *A. arabum*. Arabian Alecatoria. Achar. n. 6. Lichenogr. 596. (*Usnea ceratoides candicans, glabra et odorata*; Dill. Musc. 71. t. 13. f. 14.)—Fronde round, somewhat compressed, branched, white; branches forked; the ultimate ones pointed and curved.—Native of the East Indies, St. Helena, and Madagascar. Professor Acharius adopts this from Dillenius without examining a specimen, considering it a distinct species from his *usneoides*, n. 3, with which other botanists have confounded it. He relies also on Dillenius for the present plant being the true *Usnea* of the Arabians. But as Dillenius confounded the two, and had no authority for taking one more than the other for the Arabian *Usnea*, we cannot place any reliance on him in this respect. How far the two plants, so very similar in his figures, are specifically distinct, can only be known by an examination of the specimen of his t. 13. f. 14. at Oxford. The other is sufficiently well known, and was drawn by him from the herbarium of Mr. Charles Du Bois.

7. *A. canariensis*. Canary Alecatoria. Achar. n. 7. (*Usnea dichotoma compressa, segmentis capillaceis teretibus*; Dill. Musc. 72. t. 13. f. 15. *Muscus arboreus aurantiacus, staminibus tenuissimis, ex infulis Fortunatis*; Pluk. Almag. 254. Phyt. t. 309. f. 1.)—Fronde compressed, branched, orange-coloured; branches simply or triply forked; their ultimate segments round and capillary.—Native of the Canary islands. Acharius adopts this species entirely from Dillenius, who describes it from a span to a foot in length, compressed, undivided in the lower part, but in the upper copiously and repeatedly branched; the branches occasionally three together, and their summits very fine. The whole is neither very rigid, nor soft, smoothish, of a dull yellow inclining to red. It tinges the saliva with a reddish-orange colour, but has no particular smell.

ALEMBERT, col. 4. l. 28, for Memoires r. Membres. ALEPYRUM, in Botany, *a, without, nerveos, a bark, shell, or covering*, alluding to the want of corollaceous glumes, by which this genus is distinguished from DEVAUXIA of the same author, to be described in its proper place hereafter.—Brown Prodr. Nov. Holl. v. 1. 253.—Class and order, *Monandria Polygynia*. Nat. Ord. *Raffinaceae*, Brown.

Gen. Ch. *Cal.* Sheath of two concave, keeled, permanent valves, clasping each other at the base, containing one or more flowers. *Cor.* none. *Stam.* Filament one, capillary, drooping, about as long as the calyx; anther simple, oval. *Pist.* Germens several, from six to eighteen, ovate-oblong, superior, inserted into one side of a central oblong receptacle, and all turned one way; styles as many, thread-shaped, combined at the bottom, spreading or deflexed at the upper part; stigmas linear, downy. *Peric.* Capsules as many as the germens, membranous, oval, of one valve and one cell, bursting longitudinally at one side. *Seed* solitary, obovate, pendulous.

Ess. Ch. Sheath of two valves. Corolla none. Anther simple. Germens unilateral. Capsules bursting longitudinally at one side. Seed solitary.

A genus of small herbaceous plants, nearly allied to the more numerous one of *Devauxia*, and, in Mr. Brown's own opinion, scarcely to be separated therefrom, the want of petals in *Alepyrum* being the only difference. The three species described by this author are all natives of the fourth coast of New Holland, where he gathered them himself; nor do they appear to have been met with by any other botanist or collector. The roots are fibrous. Leaves radi-

cal, simple, linear-lanceolate, or setaceous. *Flower-stalks* radical, unbranched, single-flowered.

1. *A. polygonum*. Many-jointed Alepyrum.—Sheath single-flowered; the outer valve with a leafy point. Germans from fifteen to eighteen. Stalk twice or thrice the length of the leaves.

2. *A. Pumilio*. Dwarf Alepyrum.—Sheath single-flowered; the outer valve with a leafy point. Germans from six to nine. Stalk the length of the leaves.

3. *A. muticum*. Pointless Alepyrum.—Sheath with a few flowers; the outer valve pointed.

ALEXANDER, in *Geography*, a township of Ohio, in the county of Athens, having 765 inhabitants.

ALEXANDRIA, col. 6, l. 24, for Anaftafius r. Anatolius.

ALEXANDRIA, a town of New Ruffia, &c. add—Also, the principal Ruffian fettlement in the Fox iflands, and the refidence of the governor on the ifland of Kodiak. (See KODIAK and Fox Iflands.) The harbour is excellent, and fheltered by feveral fmall iflands lying to the S.W. It confifts of about 50 houfes built of logs, the rooms of which are caulked with mofs, and covered with grafs. This is the principal depôt of the African company, where the furs are collected. This town is named St. Paul by captain Lilliamsky. It has a church, a barrack for the Ruffian convicts, a fchool, and feveral ftore-houfes belonging to the N.W. Company. Campbell's Voyage round the World, p. 108.

ALEXANDRIA, in Grafton county, &c. for 298 r. 409.

ALEXANDRIA, in Hunterdon county, &c. for 1503 r. 2271; and for 40 r. 46.

ALEXANDRIA, in Pennfylvania. Add, containing, in 1810, 156 inhabitants.

ALEXANDRIA, a town of the diftrict of Columbia, having 7227 inhabitants, of whom 1488 are flaves. The county of the fame name, exclusive of the town, has 1325 inhabitants, including 353 flaves.

ALFORD, l. 2, for 577 r. 322.

ALFORD, a town of America, in the diftrict of Maine and York county, containing 1106 inhabitants.

ALFRED, l. 7, for tenth r. fourth.

ALFRED, of Beverley. Subjoin—See ALRED.

ALGEBRA, *Specious*, l. 4 from bottom, for four r. three. Col. 2, l. 22, for + r. —, or a + b — c — d. Line 35, for a + b r. a + c.

ALGOA BAY. Subjoin—By Barrow's chart, Cape Recife in this bay is in S. lat. 34° 10'. E. long. 25° 40'. Variation 26° 40'.

ALIEN. Subjoin—It is alfo continued by the parliament of 1818.

ALIENS Duty. Add—See BOOK of Rates.

ALKALI, *New fixed*, in *Chemiftry*. See LITHION.

ALKALI, *New Compound from Opium*. See MORPHIA and OPIUM.

ALKALINE ACRIMONY, l. 3, for four r. four.

ALL SFUGITA r. ALLA *Sfugita*.

ALL SOULS, l. ult., for Joxtin r. Jortin.

ALLALITE. See MINERALOGY, *Addenda*.

ALLANITE. See MINERALOGY, *Addenda*.

ALLANTODIA, in *Botany*, from *αλλας*; *αλλαντος*; a *faufage*, alluding to the tumid oblong figure of the *Sori*, or lines of capfules, wrapped in their membranous coverings.—Brown Prodr. Nov. Holl. v. 1. 149.—Clafs and order, *Cryptogamia Filices*. Nat. Ord. *Filices*.

Eff. Ch. Fructification in fcattered oblique lines, accompanying a vein. Involucrum vaulted, originating laterally

from the vein, and inferted into it by both margins; at length separating at the inner one.

The habit of this genus, fays Mr. Brown, is between NEPHRODIUM and DIPLAZIUM. (See thofe articles.) *Polypodium umbrofum*, Hort. Kew. ed. 1, affords an example of it, and there are fome unpublished fpecies. The cylindrical *involucrum* prohibits its union with *Aspidium* or *Athyrium* of various authors, and that membrane, being inferted by both margins into the fame vein, and truly burfting, differs from the *involucrum* of *Asplenium*, whole upper edge is not connected with the frond.

We felect the examples indicated by the author, not being quite fatifhed of the limits of this genus, which is reduced to *Aspidium* in the fecond edition of Hort. Kew. poffibly not with Mr. Brown's concurrence, his moft indubitable genus of WOODSIA (fee that article) being likewife there rejected.

We are poffeffed of many, perhaps of all, the nondefcript *Allantodia* of which he fpeaks. To thefe fome other *Aspidia* of Hort. Kew. may be akin; but *A. emulum*, placed next to *umbrofum*, is not one of them, any more than a few of the neighbouring fpecies, referred by the writer of this article to *Cyathea* in Fl. Brit. whole *involucrum* fuely does not anfwer to the above character, their *fori* being orbicular.

A. umbrofa. Madeira Wood Saufage-fern. (*Polypodium umbrofum*; Ait. Hort. Kew. ed. 1. v. 3. 466. *Aspidium umbrofum*; ed. 2. v. 5. 513. Willd. Sp. Pl. v. 5. 283. *A. axillare*; Schkuhr Crypt. t. 61.)—Frond triply pinnate; ultimate fegments lanceolate, decurrent, deeply ferrated; the lower ferratures cloven. Lines contiguous; finally confluent.—Gathered in fhady woods in Madeira, by the late Mr. Maffon, who fent roots to Kew, in 1779, and gave fpecimens to the younger Linnæus. An elegant finely divided fern, about three feet high, with roughifh *ftalks*. *Leaflets* two or three inches long, and nearly one broad, pointed, pinnatifid almoft to the mid-rib; the fegments numerous, parallel, oblong, obtufe, decurrent, veiny, fmoth, of a fine green; moft ferrated at their extremity and upper margin; one or two of the lower ferratures often cloven at the point. *Lines* moft copious about the lower part of each leaflet. *Capfules* brown. *Involucrum*s pale, variously torn and reflexed.

A. australe. Southern Saufage-fern. Br. n. 1.—Frond doubly pinnate, deltoid, membranous, flaccid. *Leaflets* pinnatifid, tapering at the point; lobes oblong, obtufe, deeply ferrated, many-flowered. *Involucrum* oblong.—Native of Van Diemen's ifland.

A. tenera. Tender Saufage-fern. Br. n. 2.—Frond doubly pinnate, membranous, flaccid. *Leaflets* pinnatifid; lobes oblong, obtufe, ferrated, flowering at the bafe. Spots linear.—Gathered by Mr. Brown, in the neighbourhood of Port Jackson, New South Wales.

The *Aspidium axillare*, Willd. Sp. Pl. v. 5. 278. Ait. ed. 2. v. 5. 512, fhould feem, if the fpecific character of Willdenow were right, to belong to the prefent genus. But we fufpect that character to have been taken from fome thing elfe. The *fori* are by no means *recti*, or ftraight; but remarkably recurved, much beyond kidney-shaped, finally affuming almoft the peltate form of a real *Aspidium*. In an early ftate indeed they are ftraight; but the inner margin is loofe, dilated, and fringed. In habit nothing can be more clofely allied to *Allantodia umbrofa* than this *Aspidium axillare*.

ALLASIA, from *αλλας*; a *faufage*, or black-pudding, in reference to the fhape and colour of the fruit.—Loureir. Cochinch. 84.—Clafs and order, *Tetrandria Monogynia*. Nat. Ord. *Cucurbitaceæ*, Linn. Juff.

Gen. Ch. *Cal.* of one leaf, inferior; tube fhort; limb in five,

five, rather acute, hairy segments. *Cor.* superior, of four small, roundish, concave, very hairy petals. *Stam.* Filaments four, awl-shaped, thick, about the length of the calyx; anthers inverted, two-lobed, each lobe of two cells. *Pist.* *Germen* roundish, between the calyx and corolla; style awl-shaped, the length of the stamens; stigma acute. *Peric.* Berry large, oblong, obtuse, smooth, fleshy, pendulous, of one cell. *Seeds* numerous, ovate, tumid, somewhat compressed, imbedded in pulp.

Eff. Ch. Berry with numerous seeds. *Germen* between the five-cleft calyx, and corolla of four petals.

1. *A. payos.* Black-pudding tree. *Muringuringue* of the Africans. — Observed by Loureiro, at Mozambique, near the eastern coast of Africa. A large tree, with spreading branches, destitute of thorns. *Leaves* opposite, digitate, of five oval, entire, hairy leaflets. *Stalks* many-flowered, nearly terminal. *Fruit* reddish-brown. A cataplasm of the leaves, applied to the back, below the kidneys, is said to promote delivery. Loureiro compares his plant, as to the leaves and fruit, with the *Sarcocolla*, Pfl. Bras. 160. It is easy to trace the natural order of this *Allasia*, and its relationship to *Carica*. Having seen no specimens, we cannot undertake to correct some apparent inaccuracies, nor to define the real character of the genus; neither is it necessary here to criticize, or to alter, the generic or specific name.

ALLEGANY, in *Geography*, a county of New York, containing 1942 inhabitants, of whom 21 are slaves.

ALLEGHANY, or ALLEGHANY County, l. 5, for 10,309 r. 25,317, and for 159 r. 24.

ALLEGHANY, in Maryland, l. 5, for 4809 r. 6909, and for 258 r. 620. Add—Also, a township of Pennsylvania, in Cambria county, having 610 inhabitants.—Also, a township of Pennsylvania, in the county of Armstrong, containing 820 inhabitants.—Also, a township of Pennsylvania, in Somerset county, having 271 inhabitants.—Also, a township of Pennsylvania, in the county of Venango, having 299 inhabitants.—Also, a township of Huntingdon county, in Pennsylvania, with 1159 inhabitants.

ALLEN, a township of Pennsylvania, in Cumberland county, having 1837 inhabitants.

ALLENSTOWN, l. 2, for 254 r. 346.

ALLEN-TOWN, for 90 houses r. 1291 inhabitants.

ALLIGATOR, after LACERTA infer, see LIZARD.

ALLIUM, in *Botany*, an ancient Latin name, of which many different etymologies have been proposed, but none has been thought perfectly satisfactory, is deduced by De Theis from the Celtic, *all*, signifying hot, pungent, or burning, than which nothing can be more suitable, whether we consider the various kinds of Garlic, Onions, &c. in common use, or the numerous wild ones. Several species require to be added to the fifty-seven enumerated by our predecessor, the late Dr. Woodville, in the first volume of this work. (See ALLIUM.) We shall indicate their respective places in each section, interpersing, in the same order, a few remarks concerning other species.

SECT. 1. *Stem leafy. Leaves flat. Umbel bearing capsules only.*

1. *A. Ampeloprasum.* Willd. Sp. Pl. v. 2. 63, n. 1. Engl. Bot. t. 1657. Fl. Græc. t. 312, unpubl. Curt. Mag. t. 1385.

β. Smaller, with sweet-smelling bright crimson flowers.—This variety is a native of the Cape of Good Hope, being the *A. Ampeloprasum* of Thunb. Prodr. 65. It must not be confounded with the β of Curt. Mag. 1385, Walldf. and Kitaib. Hung. v. 1. 84, t. 82, which Mr. Ker now thinks a variety of *arenarium*, deprived of its flower-bulbs. The same botanist, so deeply skilled in the plants of this natural

order and their allies, has expressed, like Linnæus, an opinion of the real *Ampeloprasum* not being specifically distinct from the garden Leek, *A. Porrum*, n. 2. It seems to us that the simply sheathed biennial root of this latter is essentially different from the large, globose, aggregate, perennial bulbs of the other; and the keels of the petals in *Porrum* are certainly much less rough, if ever at all so, than those of *Ampeloprasum*. A good figure of *A. Porrum* is much wanted.

Between 2 and 3. *A. Dioicoides.* Sibth. in Prodr. Fl. Græc. n. 764. (μᾶλυ; Dioic. book 3, chap. 4.)—Found in dense bushy shady situations, in Caria, Myria, and Cyprus. “The stem, in a rich soil, sometimes attains the height of five or six feet. Umbel large. Flowers white, somewhat resembling those of *Peganum Harmala*, as Dioicorides observes in speaking of the latter plant, book 3, chap. 53.” Such is all the information afforded by Dr. Sibthorp’s MSS., for he has left no specimen nor drawing of this interesting plant, supposed by him to be the μᾶλυ, or *Moly*, of Dioicorides. He has not afforded us any materials for a specific character. Can his plant be the *A. orientale latifolium*, flore magno lacteo; Tourn. Cor. 26? Of this a specimen may perhaps be found, in the collections at Paris or Oxford.

SECT. 2. *Stem leafy. Leaves flat. Umbel accompanied by bulbs.*

Here perhaps ought to have been inserted, on account of its near affinity to *rosæum*, our *ambiguum*, figured in Curt. Mag. t. 978, and destined to appear in Fl. Græc. t. 327. See Sect. 4.

SECT. 3. *Stem leafy. Leaves nearly cylindrical. Umbel bearing capsules only.*

20, 21. *A. margaritaceum.* Pearly Garlic. Sm. Prodr. Fl. Græc. Sibth. n. 770. Fl. Græc. t. 315, unpubl.—Stem bearing round leaves and an umbel of capsules. Leaves channelled. Stamens three-pointed, prominent. Petals obovate, obtuse.—Gathered by Dr. Sibthorp, about Prusa in Bithynia, as well as on mount Athos, and in the islands of Naxos, Cyprus, and Cimolis. The bulb is about the size of a filberd, coated with brown ribbed scales. Stem solitary, a foot high, erect, round, slender, leafy in its lower half. Leaves about four, spreading, tapering, as thick as a crow’s quill, rather glaucous, smooth, six inches long; channelled along the upper side; sheathing at the base; the two lowermost shorter and soon withering. Umbel erect, oval, obtuse, dense, attended at the base by several short, reflexed, jagged, white involucreal scales. Flowers on slender, ascending or upright, simple stalks, an inch long at most. Petals obovate, concave, not a quarter of an inch in length, converging, streaked with green, white at the edges, purple at the keel. Stamens white; three of them simple, awl-shaped; three linear, with two long, lateral, spreading, narrow segments. *Germen* turbinate, with six prominent angles.

26, 27. *A. caucasicum.* Crimson Caucasian Garlic. Ker in Curt. Mag. at the end of p. 1143. (*A. paniculatum*; ibid. t. 973, but not t. 1432. *A. globosum*; Redout. Liliac. t. 179, not t. 96!)—Stem bearing thread-shaped sheathing leaves, and an umbel of capsules. One valve of the sheath elongated and cylindrical. Stamens simple. Petals ovate, acute. *Germen* globose.—Native of mount Caucasus. Raised by Mr. Loddiges, from seeds imported from Russia. The cylindrical leaves, globose umbel, shorter involucreum, ovate, not obovate petals, and round, even, not oblong and channelled, *germen*, as well as the rose-coloured flowers, are sufficient marks of distinction between this plant and *A. paniculatum*, of which an imperfect figure, representing the leaves as cylindrical (contrary to nature and the description) is given in Curt. Mag. t. 1432.

A. montanum. Crimfon Olympian Garlick. Sm. Prodr. Fl. Græc. Sibth. n. 775. Fl. Græc. t. 319, unpubl. (*A. montanum*, radice oblongâ; Tournef. Inst. 384, according to Sibthorp.)—Stem bearing nearly cylindrical leaves, and an umbel of capsules. Sheath elongated, deflexed. Stamens simple. Flower-stalks uniform.—Found in the grassy pastures of the Bithynian Olympus, by Dr. Sibthorp. The *bulb* is ovate-oblong, red, with a ribbed angular coat, fibrous at the summit. *Stem* four or five inches high, smooth, round; bearing about two slender, smooth, grass-green leaves, a little channelled on their upper side, one of them rising above the *umbel*, which is rather lax. *Petals* obovate, pale rose-coloured with a crimfon mid-rib. *Germs* ovate-oblong, with six deep furrows.

A. stictiforme. Thrift-like Garlick. Sm. Prodr. Fl. Græc. Sibth. n. 776. Fl. Græc. t. 320, unpubl.—Stem bearing nearly cylindrical leaves, and an umbel of capsules. Stamens simple. Germs three-lobed. Umbel many-flowered, somewhat capitate.—Gathered by Dr. Sibthorp, in the ile of Cimolis. The *bulb* is globular, about the size of a hazel nut, with several lateral offsets. *Stem* a span high, reddish. *Leaves* about three, shorter than the stem, recurved, with striated reddish sheaths. *Umbel* dense, of about an inch and a half in diameter, rose-coloured. *Petals* obovate. *Germs*, as well as the *capsule*, turbinate, abrupt, with three rounded lobes.

A. pilosum. Hairy-leaved Crimfon Garlick. Sm. Prodr. Fl. Græc. Sibth. n. 777. Fl. Græc. t. 321, unpubl.—Stem bearing nearly cylindrical leaves, and an umbel of capsules. Stamens simple. Leaves and their sheaths very hairy.—Found by Dr. Sibthorp in the island of Cimolis, and we believe in the Peloponnesus also. *Bulb* globular, small, purplish. *Stem* a span high. *Leaves* about four, spreading, tapering, remarkably rough with spreading hairs, as are likewise their long, striated, purplish sheaths. *Umbel* lax, hemispherical, many-flowered, smooth, the flowers and their stalks of a pale purplish crimfon. *Petals* elliptic-obovate, obtuse. *Germs* of three hemispherical lobes, not turbinate.

A. junceum. Rush-leaved Purple Garlick. Sm. Prodr. Fl. Græc. Sibth. n. 778. Fl. Græc. t. 322, unpubl.—Stem bearing thread-shaped leaves, and an umbel of capsules. Three alternate stamens five-cleft. Umbel capitate.—Discovered in the island of Cyprus, by Dr. Sibthorp, who took it for *A. Schoenoprasum*, from which, however like at first sight, it differs essentially. Our plant is more allied to *A. ascalonicum*, but still distinct; and the stem is truly leafy. *Bulbs* aggregate, ovate, with dark-brown, striated, elongated coats. *Stem* a foot high, slender, erect, leafy about one-third of its height. *Leaves* two, nearly as tall as the stem, very slender, tubular, quite round, smooth, a little glaucous, somewhat spreading at the top. *Umbel* globular, dense, its sheath of two broad, ovate, acute, concave, close leaves, shorter than the flowers. *Flower-stalks* green, but half the length of the petals, which are elliptic-oblong, acute, purplish, with a darker mid-rib. *Stamens* white; three of them simple, awl-shaped; the intermediate ones flat, dilated upwards, terminating in two taper vertical teeth, on each side of a similar one bearing the anther. *Germs* elliptical, with three slight furrows.

SECT. 4. *Leaves radical. Common Flower-stalk naked.*

35. *A. inodorum*. Carolina Garlick. Ait. Hort. Kew. ed. 1. v. 1. 427. ed. 2. n. 25. Willd. n. 33. Curt. Mag. t. 1129. (*A. fragrans*; Venten. Hort. Cels. t. 26. Redouté. Liliac. t. 68. Pursh n. 2.)—"Stalk naked, obscurely triangular. Leaves linear, flat; keeled at the back. Umbel level-topped, capsule-bearing. Stamens simple."—On the

mountains of Virginia and Carolina, flowering in June. Perennial. Flowers white, with red veins. Pursh, who had seen it living. It is marked in Hort. Kew. as a hardy perennial, flowering in March and April, and introduced by the late Duchesse Dowager of Portland, in 1776. We presume Dr. Solander to be the author of the above characters, given in Hort. Kew. and that the plant of the Botanical Magazine and that of Redouté are the same, though in the former work the petals are obovate, and remarkably elongated at the base; in the latter ovate, without any such elongation. One or other is a great, and very material, error, but not having seen the plant, we know not where the fault lies. There are errors also in the detail of its history. Redouté t. 6 for 68; Venten. Malmaif. copied by Pursh from the Magazine, for Venten. Hort. Cels., which proving that the work was not consulted by Pursh, takes away our confidence in that author, as to synonyms. The name *inodorum* is acknowledged to express the want of the Garlick factor in the herbage, while that of *fragrans* alludes to the sweet scent of the flowers. We retain the original appellation. Mr. Ker, at the end of the history of t. 1293, in Curt. Mag. declares his conviction that *A. gracile*, our n. 55, is the same plant. We cannot assert the contrary, but we do not feel convinced, and there has been such a diversity of opinion on the subject, that till we can compare living specimens, we must leave the question in doubt. It is remarkable that Willdenow says *A. inodorum* "is like *angulosum* of Linnæus, but twice as large, and differing in the specific character," which chiefly amounts to the stalk of the latter being two-edged, and the leaves channelled. He had both plants living. But *angulosum* is most excellently represented in Curt. Mag. t. 1149, and surely few of the genus can bear less resemblance to t. 1129! It is scarcely more like Redouté's figures, named *fragrans*. We proceed to notice the species most akin to *inodorum*; for so at least it must be presumed to be.

35, 36. *A. gracile*. Jamaica Garlick. (See our n. 55.) Dryander. in Ait. Hort. Kew. v. 1. 429. ed. 2. n. 38. Willd. n. 52. Andr. Repof. t. 107. Ker in Curt. Mag. at the end of p. 1293, var. 1. (*A. striatum*; Redouté. Liliac. t. 50. Curt. Mag. t. 1035? and t. 1524?)—"Stalk naked, round, very long. Leaves linear, channelled. Stamens awl-shaped, connected at the base."—Native of Jamaica, from whence it was sent to Kew, by Hinton East, esq., and flowered in the stove, in February. Aiton. Leaves a foot long, resembling those of a Narcissus. Stalk three feet high, slender. Petals erect, white, with claws, which are united with the stamens below, into a green tube. Perhaps this plant may form a distinct genus. Dryander as above. The writer of the present article happened to be with Mr. Dryander, when the original specimens of this *Allium* were brought from Kew, and on being asked for a name suggested the above. He then obtained a specimen, which is now, along with others gathered at Kew in 1788, in his herbarium, as well as one more, undoubtedly the same species, procured from Mr. Vere's collection, in 1814, as a rare plant, by the name of *A. striatum*. He can therefore speak to the whole herb being destitute of the Garlick odour, and to the want of scent in the flowers; by day at least, though they may very probably be, as reported, fragrant at night. He can also vouch for the fidelity of Mr. Andrews's figure; nor does he hesitate concerning t. 50 of Redouté; whatever scruples a deference to Mr. Ker may suggest, as to the two figures named *striatum* in Curt. Mag. The suspicion of a generic difference between this plant and *Allium*, arose in Mr. Dryander's mind, from the combination of the stamens, and was strengthened by the want of the garlic flavour,

ALLIUM.

flavour. The *leaves* are certainly not remarkably striated at the back, as in the real *striatum*, of which we shall next speak.

A. striatum. Streaked-leaved Garlick. (See our n. 37.) Jacq. Coll. v. 5. 51. Ic. Rar. t. 366. Willd. n. 35. Ait. n. 27.—Stalk naked, slightly triangular. Leaves linear, somewhat channelled; convex, with many furrows, but no keel, beneath. Umbel level-topped. Petals oblong-lanceolate. Stamens simple.—Native of the Cape of Good Hope, flowering in the garden in September and October. Whole plant smooth, without much scent. *Bulb* the size of a hazel-nut, white, coated. *Leaves* about four, all radical, six inches or more in length, linear, bluntish, oblique, but little channelled; rather convex and striated at the back, but not triangular. A transverse fission, under a magnifier, shews a single row of perpendicular tubes, each running behind one of the furrows; but the *leaf* is not itself hollow, or tubular. *Stalk* radical, obscurely triangular, slender, erect, as tall as the leaves, or taller. *Umbel* of seven flowers, more or less, the partial stalks an inch and a half long. *Sheath* of two erect, ovate, pointed, membranous valves. *Petals* long-lanceolate, rather acute, spreading, white with a green longitudinal line in the middle. *Filaments* awl-shaped, equal, shorter than the petals. *Anthers* oblong, incumbent, yellow. *Jacquin*.

This figure and description surely do not suit our *gracile*. But whether the *striatum* does really come from the Cape, or from Virginia and Carolina, we are quite in the dark. Pursh's *striatum* is our *ornithogaloides*, n. 57. Curt. Mag. t. 1524 answers better to his description than t. 1035, but we cannot prove them the same. We have endeavoured to unravel the original materials which concern these three species, but having had no means of comparing fresh specimens, nor having indeed seen any at all of Jacquin's plant, we are unable to attempt good specific characters, and therefore leave the whole for future examination, satisfied of one thing, at least, that these species are not at present well understood. To illustrate them, great attention to the outline of the *petals*, shape and insertion of the *stamens*, and form of the *germen*, circumstances not yet well observed in *Allium*, will be found of primary importance.

39. *A. pedemontanum*. Red Piedmontese Garlick. Willd. n. 37. (*A. nigrum*; Allion. Pedem. v. 2. 158. t. 25. f. 1. *A. roseum*; Linn. Sp. Pl. ed. 2. 432, but not Sp. Pl. v. 1. 296.)—Stalk obscurely quadrangular. Bulb cylindrical. Leaves linear, obtuse, keeled at the back. Umbel rather dense, of few flowers. Petals elliptical.—Native of mountainous situations in Piedmont. Specimens from Allioni and Bellardi prove this species, as distinct from *nigrum* as from *roseum*, to have been confounded by Linnæus with the latter, which has a globose, very prolific *bulb*, a somewhat leafy *stem*, and far more numerous, brighter-coloured, *flowers*.

39, 40. *A. stellatum*. Missouri Garlick. Ker in Curt. Mag. t. 1576. Ait. Epit. 363. (*A. angulosum*; Pursh n. 4, excluding the synonyms.)—Stalks somewhat two-edged, recurved before flowering. Bulb ovate-oblong. Leaves linear, triangular, sharply keeled. Umbel many-flowered, lax, level-topped. Stamens combined at the base. *Germen* depressed, bluntly triangular.—Found on the banks of the Missouri, by governor Lewis and Mr. Nuttall, flowering in July, and imported by Mr. Frazer, in whose nursery it bloomed in June 1813. Pursh by mistake says the *flowers* are white. In the Botanical Magazine they are represented of a deep pink, and the herbage somewhat glaucous. The *stalks* are two or more. The *sheath* is of

only one valve; but Mr. Ker doubts the permanency of that character.

A. cernuum. Bowed-umbelled Garlick. "Roth. Nov. Pl. Spec. in Roem. Archiv. n. 3. 40. Catal. Bot. fasc. 2. 33. t. 2." Sims and Kon. Ann. of Bot. v. 2. 27. Ker in Curt. Mag. t. 1324. Ait. Epit. 363.—Stalk angular; recurved at the summit. Leaves linear, slightly channelled, pointed. Umbel drooping, many-flowered. Stamens simple, twice as long as the corolla; tumid at the base. *Germen* turbinate.—Native of mount Caucasus, according to Mr. Aiton, who says it was introduced into England in 1801. The *bulbs* are oblong, tapering, aggregate. *Stalk* eighteen inches high; roundish, compressed, and recurved, at the top. *Leaves* bright-green, narrow. *Flowers* white, with a delicate rose-coloured tinge. *Petals* ovate. *Stamens* unequal at first, but finally all about twice the length of the corolla. *Germen* three-horned. *Ker*.

A. rubellum. Reddish Iberian Garlick. Marsch. Taur.-Caucas. v. 1. 264.—"Stalk nearly naked, round. Leaves semi-cylindrical, channelled. Sheath short. Umbel convex, many-flowered. Stamens simple, half as long as the corolla."—Gathered by Mr. Steven in Georgia. *Bulb* the size of a filbert. *Stalk* with one or two leaves sheathing the base, on which account the author cited doubts whether this species and the following might not be referred to the third section; but there are many of the fourth whose foliage, when the bulb is deep, becomes in some degree cauline. *Leaves* a line broad, rather fleshy. *Flower-stalks* slender, much longer than the *flowers*, which are hardly so big as those of *A. Ampeloprasum*, of a pale purple, with acute *petals*.

A. saxatile. Stone Garlick. Marsch. Taur.-Caucas. v. 1. 264. Sims and Kon. Ann. of Bot. v. 2. 436, excluding the synonym of Gmelin.—"Stalk almost naked, round. Leaves semi-cylindrical. Sheath pointed, longer than the umbel. Stamens simple, longer than the corolla."—Frequent on the lime-stone rocks of Taurida, flowering in July and August. *Bulbs* aggregate, oblong, with dark brown coats. *Stalk* with a few sheathing leaves at the base, like the foregoing. *Petals* spreading. There is a variety with purplish *flowers*, on the eastern mountains of Caucasus. This species is very closely related to *A. stellerianum*, Willd. n. 49, see our n. 51; but differs in having a long awl-shaped *sheath*. *Marschall*.

A. bisulcum. Jonquil-leaved Garlick. Redout. Liliac. t. 286. Curt. Mag. t. 1381. Ait. Epit. 363.—Bulb cylindrical. Stalk round. Leaves two-ranked, semi-cylindrical, channelled, acute. Umbel dense, convex. Petals oval. Filaments awl-shaped, the length of the corolla; three of them broader at the base.—Native country not known. The plant is said to be quite hardy, and of easy culture, flowering in June and July. Mr. Ker remarks its great resemblance to *sensifens*, (see n. 32,) Curt. Mag. t. 1150, next to which perhaps it ought to be placed, though akin also to our last, from which the shortness of the *sheath* distinguishes the present plant. The narrow and thick *leaves* are very different from *sensifens*; and Redouté has observed that the inner ones are channelled on both sides; which may, as Mr. Ker thinks, be occasioned by pressure in an early state.

40, 41. *A. triflorum*. Three-flowered Garlick, or Mountain Leeks. Pursh n. 5.—"Stalk naked, round, shorter than the leaves, which are lanceolate and ribbed. Umbel of few flowers."—In shady woods, on the high mountains of Pennsylvania, flowering in May and June. Perennial. *Pursh*.

44, 45. *A. lacinum*. Milk-white Garlick. Sm. Prodr. Fl.

Fl. Græc. Sibth. n. 781. Fl. Græc. t. 325, unpubl. (A. album; Bivona Sic. cent. 1. 16. "Santi Viagg. al Montan. 352. t. 7. Bertol. Gen. 51. Savi Etrusc. v. 2. 210.)—Stalk naked, triangular. Leaves lanceolate, sessile. Petals obtuse.—Native of fields in Italy and Sicily, flowering in March. This is one of those plants, which, on account of their novelty, or rarity, Dr. Sibthorp admitted into his *Flora Græca*, having gathered them in the course of his travels, though perhaps not in Greece itself. *A. lacteum* agrees with *triquetrum*, n. 44, next to which it should be placed, in having an acutely triangular stalk; but differs in the lanceolate leaves, and shorter, broader, more obtuse, petals. The stigma moreover is simple, not three-lobed.

A. ambiguum. Bulbos Rose Garlick. Sm. Prodr. Fl. Græc. Sibth. n. 783. Fl. Græc. t. 327, unpubl. (A. roseum β; Ker in Curt. Mag. t. 978. Bivona Sic. cent. 1. 18. Savi Etrusc. v. 2. 210. "A. carneum; Targioni Tozzetti Ist. Bot. ed. 2. v. 2. 242. t. 6. Moly angustifolium campanulatum, flore roseo, nodosum; Cupani Pamph. v. 2. t. 219." Moly serpentinum vocatum; Lob. Ic. 160.)—Stalk naked. Leaves semi-cylindrical. Stamens simple, shorter than the corolla. Umbel bulbiferous.—Native of Italy and Sicily, flowering in May. Frequent about Pifa Savi. On the hills of St. Martino near Palermo. *Bivona*. This *Allium*, which, with respect to the *Flora Græca*, stands in the same predicament as the last, is made by all authors a variety of *roseum*; for the difference between the species with bulbiferous, and those with seed-bearing, umbels, is acknowledged to be, in many instances, not infallible. In the plant before us, however, there is a great disagreement, as to the character of *roseum*, which is described with flat leaves and a leafy stem. But the dried specimens are very much alike, not discovering in either the semi-cylindrical and hollow structure of the leaves, shewn by Dr. Sibthorp's figure. As to

the stem being leafy or not, many species are in this respect ambiguous, and *roseum* is perhaps improperly considered as of the former denomination. Their roots are precisely alike. The flowers of *roseum* are far more numerous, and of a finer pink hue.

We cannot conclude our survey of *Allium* without a remark that the whole genus requires to be reformed, with regard to the arrangement of the species, and the specific characters of many of them. We are also aware of several that might be added to the above list, but of which we want sufficient specimens or information clearly to dispose of them, so as to elucidate rather than confound the subject.

ALLOCHROITE. See MINERALOGY, *Addenda*.

ALLOY, in *Chemistry*, a combination of two or more metals. In addition to what has been said on this subject in the Cyclopædia, we may add the following tabular views from Dr. Thomson, of the general properties of the different alloys, as far as they have been examined. The chemistry of alloys is at present but little understood, and, as Dr. Thomson justly remarks, these compounds in general appear to be much better known to artists and manufacturers than to chemists.

The first of the following tables comprehends the alloys of the malleable metals with each other; the second, the alloys of the brittle metals; and the third, the alloys of the malleable and brittle metals. In these tables, the letter M signifies malleable; B, brittle; S, submalleable, used when the alloy is malleable in certain proportions, but brittle in others. O is used when the metals do not unite. The sign + is used when the alloy occupies a greater bulk than the separate metals; the sign - when the alloy occupies a smaller bulk. The first indicates an expansion; the second, a condensation.

TABLE I.—Malleable Metals.

Zinc												
M	Lead											
M	M +	Tin										
O	O	B	Nickel									
S	B +	M	M	Iron								
S -	B +	B -	B	S	Copper							
					M	Iridium						
B	B	B		S		Potassium						
B	B	B				Sodium						
	B	B +		B	S -	B	Palladium					
B	B	B	O	B	B	B	B	B	Mercury			
B -	B -	B -	O	M	M +	M		M -	B -	Silver		
B	S -	S -		M -	M -	M		M +	B	M +	Platinum	
B -	B +	S -	M +	M +	M +	M		M	B	M -	M +	Gold

ALLOY.

TABLE II.—Brittle Metals.

Titanium									
	Tungsten								
		Chromium							
			Uranium						
				Molybdenum					
	B			B	Manganese				
				B		Cobalt			
				B		B	Arsenic		
								Tellurium	
		B		B	O		B		Antimony
		B		S	O	O	B		Bismuth

TABLE III.—Malleable and Brittle Metals.

	Bismuth.	Antimony.	Arsenic.	Cobalt.	Manganese.	Molybdenum.
Gold - - - - -	B -	B -	B	B -	M	B
Platinum - - - - -	B	B	B			B -
Silver - - - - -	B -	B -	B	B		B
Mercury - - - - -	B	B	B	O	O	O
Palladium - - - - -	B -		B			
Rhodium - - - - -						
Potassium - - - - -	B	B	B			
Sodium - - - - -	B	B	B			
Copper - - - - -	B -	B -	M		M	S
Iron - - - - -	B +	B +	B	B	S	B
Nickel - - - - -	B		B +	B		S
Tin - - - - -	M	M? +	B		B	
Lead - - - - -	M -	M -	B	B		S
Zinc - - - - -	O	B +	B	O	O	O

ALMANAC, col. 2, l. 15, ad, see STAMP.

ALMUDE, in *Commerce*, a liquid measure in Portugal, &c. (See Table XXXII. of MEASURES.) At Lisbon, wine and oil are sold by the pipe of 26 almudes; but the pipe of Lisbon wine sent to England contains about 31 almudes, and the standard gauge at the London Custom-house is 149 gallons; the Lisbon almude is therefore reckoned at $4\frac{1}{2}$ English gallons. At Oporto, the pipe is divided into 21 almudes, which almude and its subdivisions are $49\frac{1}{2}$ per cent. greater than those of Lisbon; so that the standard gauge of a pipe of port at the Custom-house of London is 138 gallons, so that the almude of Oporto is accordingly equal to six English gallons and five pints nearly.

ALNUS, in *Botany*, the Alder, an ancient Latin name, which De Theis derives from the Celtic, *al*, near, and *lan*, the brink of a river, the letters having become transposed for easy pronunciation. This is fuitable enough to the tree in question, which always grows near water, even on the loftiest mountains, nor have we met with a better etymology.—Willd. Sp. Pl. v. 4. 334. Sm. Compend. 133. Prodr. Fl. Græc. Sibth. v. 2. 232. Ait. Hort. Kew. v. 5. 258. Pursh 622. Raii Syn. 442. Tourn. t. 359. Gært. t. 90. (Betula, as to the character; Linn. Gen. 485. Sm. Fl. Brit. 1011. Engl. Bot. 1508. Lamarck Illustr. t. 760. f. 3. See BETULA.)—Class and order, *Monocotyledon Tetrandria*. Nat. Ord. *Amentaceæ*, Linn. Juss.

Gen. Ch. Male. *Cal.* Catkin cylindrical, imbricated every way, lax, composed of wedge-shaped, three-flowered, abrupt, three-cleft scales. *Cor.* compound, of three equal; tubular, four-cleft florets, sessile on the disk of each scale; their segments deep, equal, ovate, obtuse, spreading. *Stam.* Filaments four, minute, inserted into the base of each segment, and not quite so long as the segment; anthers of two round lobes.

Female, on the same plant, *Cal.* Catkin elliptical, imbricated, close, consisting of two-flowered, rounded, pointed, obscurely three-cleft, concave scales. *Cor.* none. *Pist.* Germens two to each scale, ovate, minute, depressed; styles two to each germen, tapering, rather longer than the scale; stigmas simple. *Seed.* Nut naked, compressed, of two cells, with solitary kernels.

Eff. Ch. Male. Calyx the scale of a catkin, of one leaf, three-cleft, three-flowered. Corolla deeply four-cleft.

Female, Calyx the scale of a catkin, of one leaf, obscurely three-cleft, two-flowered. Styles two. Nut compressed.

The presence of a corolla in the male flowers, with a determinate number of stamens equal to that of its segments, are sufficient marks of generic distinction between this genus and *Betula*, which has no corolla in either flower, and whose stamens are numerous, and indefinite. The fertile catkin moreover is elliptical in *Alnus*, cylindrical in *Betula*. Gærtner finds differences in the seeds, which, if the germen be attended to, appear to us less decisive. By an accidental oversight, *Alnus* was neglected to be separated from *Betula*, in our PLANTS OF BRITAIN; see that article.

1. *A. glutinosa*. Common Alder. Gært. v. 2. 54. Willd. n. 1. Ait. n. 1. Sm. Compend. n. 1. Pursh n. 1. (Alnus; Matth. Valgr. v. 1. 127. Camer. Epit. 68. Lob. Ic. v. 2. 191. Ger. Em. 1477. Loef. Prull. 10. t. 1. A. n. 1630; Hall. Hist. v. 2. 300.)

β , incisa; leaves roundish, notched. Willd.

γ , laciniata; leaves oblong, pinnatifid, with acute segments. Willd. Ait. β .

δ , quercifolia; leaves oblong, sinuated, with obtuse segments. Willd.

Leaves roundish-wedge-shaped, obtuse, wavy, glutinous; downy at the branching of the veins beneath.—Native of

swamps and the neighbourhood of rivers and pools, in low lands, as well as on mountains, throughout Europe, the north of Asia, and of Africa, as also in Canada and on the north-west coast of America, (*Pursh*.) flowering in March or April. In landscape this tree often supplies the want of the rich dark foliage of the Oak, where the latter will not thrive. The leaves are not fully expanded till the end of May, but they remain late in autumn. For the uses and further history of this tree, see BETULA, n. 6. Our γ is the only variety cultivated for ornament, or rather curiosity, in England.

2. *A. oblongata*. Turkey Alder. Willd. n. 2. Ait. n. 2. (*A. folio oblongo viridi*; Bauh. Pin. 428. Hort. Angl. 5. *Betula oblongata*; Ait. ed. 1. v. 3. 338.)—Leaves elliptical, bluntnish, glutinous; the branching of the veins naked beneath.—Native of the south of Europe. Cultivated in England ever since the year 1730, at least, but not much in request. The leaves are smaller than the foregoing, obovate, or elliptic-oblong, sharply serrated. *Catkins* of seeds nearly globular.

3. *A. incana*. Hoary Alder. Willd. n. 3. Ait. n. 3. (Alnus; Linn. Fl. Lapp. ed. 1. 260. *A. folio incano*; Bauh. Pin. 428. *A. hirsuta*; Bauh. Matth. 133. *A. altera*; Clus. Hist. v. 1. 12. *A. n.* 1631; Hall. Hist. v. 2. 301. *Betula incana*; Linn. Suppl. 417. Ait. ed. 1. v. 3. 339. Ehrh. Arb. 116. Beitr. v. 3. 22. Willd. Arb. 45. *B. Alnus* β ; Linn. Sp. Pl. 1394.)

β , angulata; leaves green beneath, with green footstalks. Ait.

γ , pinnata; leaves pinnate, hairy beneath; young branches hairy. Willd.

(*Betula pinnata*; "Lundmark in Stockh. Transf. for 1790, 122. t. 5.")—Leaves elliptic-oblong, acute; downy beneath; the branching of the veins naked. *Stipulas* lanceolate.—Native of marshes and the banks of rivers throughout Lapland, *Linnæus*. It occurs also in alpine situations, in Germany, Switzerland, &c. The variety γ , of which we have specimens from Dr. Swartz, has been met with in one part of Sweden only, Waermland, and is increased by root only. The leaves are small, pinnate, and jagged. The usual appearance of *A. incana*, except its hoariness, and the glaucous hue of the back of its leaves, is not very unlike *A. glutinosa*. The leaves however are more acute, and their footstalks are reddish. This last character, as well as the glaucous hue just mentioned, is wanting in variety β . The general pubescence of the under side of the leaves renders it difficult to say how far the veins differ at their origin from those of the Common Alder, but though downy, they certainly want the glandular roughness so remarkable in that species. See BETULA, n. 7, for a further account of this tree.

4. *A. undulata*. Curl-leaved Alder. Willd. n. 4. Ait. n. 4. (*A. crispata*; Pursh n. 2. *Betula crispata*; Ait. ed. 1. v. 3. 339. Michaux Borel.-Amer. v. 2. 181.)—"Leaves oblong, acute; rounded at the base; veins hairy beneath, like the footstalks, but naked at their origin. *Stipulas* ovate-oblong."—In Canada, and on the high mountains of Pennsylvania, in swamps overrun with Bog-mosses, flowering in April. *A. strub.*, not above three or four feet high. *Leaves* doubly serrated. *Pursh*. See BETULA n. 13. Willd. denoms few that have unwarrantably changed the name of this species.

5. *A. ferrulata*. Hazel Alder. Willd. n. 5. Ait. n. 5. Pursh n. 3. (*Betula ferrulata*; Ait. ed. 1. v. 3. 338. Michaux Borel.-Amer. v. 1. 181. Willd. Arb. 45. Smith Inf. of Georgia v. 2. 183. t. 92. *B. rugosa*; Ehrh. Beitr. v. 3. 21. "Wangenh. Amer. 86. t. 29. f. 60.")—Leaves obovate,

obovate, finely ferrated; veins and their origin hairy beneath. Stipulas elliptical, obtuse.—Native of North America. Common every where in swamps, and by river sides, flowering in March. A *shrub*, from six to ten feet high, growing in close thickets. *Pursh*. See *BETULA* n. 12. The *leaves* do not appear to be glutinous, or at least not so much so as the Common Alder, from which also they differ in being regularly and finely ferrated, not notched, or jagged.

ALOEXYLUM, ἀλοξύλον, *Aloes-wood*, a name given to the tree which produces this precious wood, by Loureiro; Fl. Cochinch. 267. See **AGALLOCHUM**.—He refers it to the Clafs and Order, *Decandria Monogynia*, and its Natural Order seems to be *Lomentaceæ*, Linn. *Leguminosa*, Juff.

Gen. Ch. *Cal.* Perianth inferior, of four acute, hairy, deciduous leaves; the lowermost falcate, incurved, nearly twice as long as the rest. *Cor.* Petals five, unequal, longer than the calyx. *Stam.* Filaments ten; anthers *Pist.* Germen superior, elongated, curved, compressed; style thread-shaped; stigma *Peric.* Legume woody, smooth, falcate. *Seed* solitary, oblong, curved, tunicated.

Eff. Ch. Calyx of four acute deciduous leaves; the lower one longest. Petals five, unequal. Legume curved. Seed solitary, tunicated.

1. *A. Agallochum*. Fragrant Aloes-wood.—Native of the loftiest mountains of Cochinchina, near the great river which runs between that kingdom and Laosios. A large lofty tree, with erect branches. *Bark* fibrous, brown, smooth, not thick. *Leaves* alternate, stalked, lanceolate, flat, entire, smooth, rather coriaceous, eight inches long. *Flower-stalks* terminal, many-flowered. *Loureiro*. This genus is manifestly different from *AQUILARIA*. (See that article.) Loureiro describes the wood as white and inodorous, becoming resinous and fragrant in consequence of some injury, till the tree dies. No part of this tree is milky, nor poisonous. He adds, that all the sorts of genuine aloes-wood are produced by this tree, even the most precious, termed *Calambac*, which is found no where but on the mountains of Champagne, belonging to Cochinchina, situated about the 13th degree of north latitude. The inferior species, or rather varieties, are obtained in various places, sometimes in pieces weighing thirty pounds or more. "There are," says Loureiro, "other fragrant woods, called by ignorant persons *Agallochum*, and *Lignum Aloes*, differing greatly from each other, and the produce of different plants." The common writing paper of Cochinchina is made of the bark of this tree. Yet the plant itself seems rare, Loureiro having long enquired in vain for the flowers, and having obtained them but once, in a bruised and mutilated condition.

Whether the *Agallochum*, or *Calambac*, Rumph. Amboin. v. 2. 29, of which that author gives no figure, be the plant of Loureiro, we cannot positively determine, though it seems likely. The *Agallochum secundarium*, or *Garo*, of the same volume, 34. t. 10, is certainly the *Aquilaria*. We have received from Dr. Roxburgh specimens of the wood itself; as well as of the fruit, agreeing exactly with Rumphius's figure, and evidently the *Gyrinops Walla* of Gartner, v. 2. 276. t. 140. In Tr. of Linn. Soc. v. 11. 230, the writer of this has hinted at the probable affinity of *Aquilaria* to the *Euphorbia*.

ALONSOA, a genus established by Ruiz and Pavon, Fl. Peruv. Syst. 150, and adopted in Ait. Hort. Kew. v. 4. 27, is founded on two species of **HEMIMERIS**, (see that article,) nor can we discover the least possible character to distinguish them from the latter; which having been much confuted in its history, by Linnæus, was perhaps not understood by the authors of the *Flora Peruviana*. These species are our *H. urticifolia*, (*Alonsoa incissifolia*; Fl. Peruv.) and

H. linearis, (*A. linearis* of the same work.) Professor Willdenow, though he had never seen more than one *Hemimeris*, the montana, and that in a dried state, could not overlook the identity of these genera, nor can we account for its having escaped the learned editors of the Hortus Kewensis. But it is evident from their generic character of *Alonsoa* that they did not contrast the two genera; for these are proved the same by the character itself, which runs thus, and is equally suitable to both.

Calyx in five deep segments. Corolla nearly wheel-shaped, reversed, five-cleft; its uppermost segment largest. Stamens declining; with smooth filaments; and converging uniform anthers. Capsule of two cells.

Hemimeris, being a long-established Linnæan name, of appropriate and unexceptionable meaning, must, of course, be retained.

ALPINIA, the article already given requires reformation, in consequence of subsequent discoveries, chiefly owing to Mr. Rofcoe's investigations. (See **SCITAMINEÆ** and **ROSCOEÆ**.) Recurring to the original genus, founded by Plumier, and adopted by Linnæus, as the basis of the whole, we do not, in quoting various authors, who have followed these, consider as *Alpinia* all that they have included herein. We shall limit the characters after Mr. Rofcoe's principles, so as to exclude what does not belong to this very natural genus, and, on the other hand, to introduce what has, under other names, been improperly separated from it.—Linn. Gen. 3. Schreb. 4. Willd. Sp. Pl. v. 1. 11. Mart. Mill. Diét. v. 1. Ait. Hort. Kew. v. 1. 3. Rofcoe Tr. of Linn. Soc. v. 8. 343. t. 20. f. 7. Sm. Ex. Bot. v. 2. 93. Roxb. Afiat. Ref. v. 11. diff. 7. Juff. 63. Gært. t. 12. (*Alpinia*; Plum. Gen. 26. t. 11. Renealmia; Linn. Suppl. 7. Schreb. 2. Willd. Sp. Pl. v. 1. 6. Mart. Mill. Diét. v. 4. Catimbium; Juff. 62. Zerubet; Wendl. Serf. Hannov. t. 19. Jacq. Fragm. Diét. 50. t. 68.)—Linn. Clafs and order, *Monandria Monogynia*. Nat. Ord. *Scitamineæ*, Linn. *Canna*, Juff.

Gen. Ch. *Cal.* Perianth superior, of one leaf, tubular, irregularly splitting into two or three teeth. *Cor.* of one petal, irregular, tubular at the base: limb double, unequal; the outermost two-lipped, in three deep segments, of which the upper one is usually broadest, and concave, the two lower equal and narrower; innermost of a single lip, straight, as long or longer than the outer limb, dilated, lobed, or jagged, at the extremity, furnished at the base with a pair of awl-shaped teeth. *Stam.* Filament one, opposite to the lip, short and stout, quite simple; anther terminal, erect, thick, simple, without any appendage, convex at the back, emarginate, divided in front into two parallel, close, oblong lobes, bursting longitudinally. *Pist.* Germen inferior, elliptic-oblong, with three furrows; style thread-shaped, erect, smooth, the length of the stamen, embraced by the lobes of the anther; stigma peltate, umbilicated, hairy. *Peric.* Capsule fleshy, oval, abrupt, umbilicated, with three furrows, three valves, and three cells. *Seeds* numerous, tunicated, ovate, angular, abrupt, inserted into a pulpy receptacle.

Eff. Ch. Anther two-lobed, terminal, embracing the style, without any appendage. Inner limb of the corolla a simple lip. Capsule fleshy.

Dr. Roxburgh, who had opportunities of studying the various species of this, and many other Scitamineous genera, in their native situations, speaks of *Alpinia* as a good natural genus, having, besides the proper characters in the fructification, certain peculiarly striking ones in the habit. The roots are perennial, tuberous, strong, thick, crooked, running nearly horizontally, a little below the surface of the ground,

ALPINIA.

and strongly marked with annular scars where former leaves have been; these send down copious, long, thick, fibrous radicles. *Stems* either biennial or perennial, numerous, tufted, straight, erect, or more or less recurved at the summit, densely leafy, each terminating in a copious *cluster*, or *panicle*, of large gaudy flowers, "except *Cardamomum*," says Dr. Roxburgh; but that plant, which has a radical panicle, is now excluded from *Alpinia*, and called by Dr. Maton *Eleteria* in Tr. of Linn. Soc. v. 10. 249; having sufficient marks of generic distinction in the *filamen*. We shall endeavour to collect under one view the numerous species of this fine genus, of which we can find any account, or have seen any figures or specimens.

1. *A. racemosa*. Simple-clustered *Alpinia*. Linn. Sp. Pl. 2. Willd. n. 1. Ait. n. 1. Rofc. Tr. of Linn. Soc. v. 8. 345. Swartz Obs. 5. (*Alpinia racemosa* alba, cananorici foliis; Plum. Ic. 11. t. 20. Zingiber sylvestre minus, fructu e caulium summitate exeunte; Sloane Jam. v. 1. 165. t. 105. f. 1.)—Cluster simple, erect. Outer bractees lanceolate, longer than the flowers. Calyx bell-shaped, with three blunt equal segments. Germen smooth.—Native of rather mountainous shady woods in the West Indies. Notwithstanding Dr. Swartz's doubts, we have no scruple respecting Plumier's synonym. *Root* branching, fleshy, with the flavour of Ginger; used in Jamaica as a poultice for cancers and other sores, according to Sloane, with good success. *Stem* herbaceous, two or three feet high, round, smooth, slender, simple, leafy. *Leaves* alternate, elliptic-lanceolate, entire, smooth, pointed, a foot long, with narrow sheathing footstalks exceeding them in length. *Cluster* terminal, solitary, stalked, unbranched, smooth, many-flowered. *Outer bractees* lanceolate, blood-red; the lowest an inch and a half long, the rest about an inch; *inner* bell-shaped, containing one or two flowers, shorter than the calyx, permanent. *Calyx* red, with broad and shallow teeth. *Corolla* white; tube slender, longer than the calyx; outer limb with three nearly equal, ovate, erect segments; inner somewhat heart-shaped, three-lobed, the middle lobe notched. *Germen* bluntly triangular, quite smooth, as well as the *capsule*. *Seeds* shining.

2. *A. Galanga*. Galangale *Alpinia*. Rofc. Tr. of Linn. Soc. v. 8. 345. Roxb. n. 1. Willd. n. 2. (*Maranta Galanga*; Linn. Sp. Pl. 3. Swartz Obs. 8. *Amomum Galanga*; Loureir. Cochinch. 5? *Galanga major*; Rumph. Amboin. v. 5. 143. t. 63. Dale Pharmac. 276. Ger. Em. 33.)—Cluster compound, erect. Bractees all lanceolate, shorter than the flowers. Calyx bell-shaped, with three rather pointed equal segments. Germen slightly downy.—Native of various parts of the Malay Archipelago, communicated by the late Dr. Roxburgh, from the Calcutta garden, where this plant flowered during the hot season, and ripened seed, though very rarely, in November. The root proved to be the real *Galanga major* of the shops. The stem is said to be seven or eight feet high. Leaves eighteen or twenty-four inches long, soft to the touch, though scarcely conspicuously downy. Cluster large, with very numerous, crowded, short, racemose branches, all downy. Bractees uniform, lanceolate, downy; those at the base of each principal branch very small. Flowers white. Calyx besprinkled with minute resinous dots. Corolla elongated; lip externally downy, cleft at the extremity. "Capsule small, obovate, smooth, deep orange-red, not opening spontaneously. Seeds only two in each cell, even in the germen, bitter and nauseous, each three-fourths covered with a white tunic." Roxburgh. See GALANGAL.

3. *A. occidentalis*. Scaly-clustered *Alpinia*. Swartz Ind. Occ. 9. Rofc. Tr. of Linn. Soc. v. 8. 345. Willd.

n. 4. Ait. n. 2. (*Amomum minus*, scapo vestito, floribus spicatis; Browne Jam. 113, excluding Sloane's synonym. *Paco-ferosa* minor multicaulis; Plum. MSS. cum icone.)—Cluster compound, erect, on a scaly leafless stem. Partial bractees imbricated, sheathing, dilated, abrupt, hairy. Calyx turbinate, with three broad obtuse segments. Germen slightly downy.—Native of moist parts of the mountainous woods of Jamaica, flowering all the year, but especially in spring. Root knotty and fleshy. Barren stems six feet high, erect, herbaceous, simple, leafy. Leaves elliptic-lanceolate, acute, very smooth, attached by a short contraction to their sheathing footstalks, as in the other species. Flowering stems as tall as the others, round, smooth, erect, not leafy, but clothed from top to bottom with sheathing, oblong, obtuse scales, and terminating in a dense, erect, cylindrical, compound, many-flowered cluster, with hairy stalks. Flowers all turned upwards, crowded, their partial stalks concealed by concave, sheathing, abrupt, partial bractees, while each common stalk, or branch of the cluster, has at its base a very different, lanceolate, acute bractee, half its own length. Calyx coloured, hairy at the base; its segments smooth, rounded and obtuse. Corolla pale yellow; tube the length of the calyx; lip veiny, cleft at the end. "Capsule rather small, coriaceous and fleshy, of three valves, red when ripe, pulpy within. Seeds yellow, two or three in each cell." Swartz. We are indebted to Mr. Lambert for a drawing of this plant, copied from Plumier's sketches at Oxford.

The habit of this species may, at first sight, seem to invalidate the character of a leafy stem, with terminal inflorescence, attributed to this genus in our introductory remarks. We think however that the difference between this and the others is more apparent than real. The scales may be considered as abortive leaves, not perfected on the flowering stems, while those stems which luxuriate in foliage, do not also bear fructification. Perhaps the roots are more prolific than in other species.

4. *A. Alughas*. Ceylon *Alpinia*. Rofc. Tr. of Linn. Soc. v. 8. 346. Roxb. n. 2. Ait. n. 3. (*Hellenia Alughas*; Willd. Sp. Pl. v. 1. 4. Andr. Repot. t. 501. *Hertiera Alughas*; Retz. Obs. fasc. 6. 1. t. 1.)—Cluster panicled, erect. Calyx bell-shaped, two-lobed. Germen hairy. Lip two-lobed.—Native of the East Indies. Very common in Bengal, flowering throughout the rainy season, and ripening fruit in October and November. We received in 1786 a flower from Koenig's specimen of this plant, sent to professor David Van Royen by the name of *Grana Paradisi Zeylanica*. It appears without doubt to be the *Alughas* of Hermann, mentioned, but not ascertained systematically, in Linn. Zeyl. 207. n. 449, and it is said to be the *Mala-infibikua*, Rheede Hort. Mal. v. 11. t. 14. The illustrious sir William Jones has described it, by the Sanscrit name of *Taraca*, in the Asiatic Researches, v. 4. 240. The stem is two feet high, simple, leafy. Leaves lanceolate, pointed, smooth, with long sheaths. Cluster, or rather panicle, variously subdivided, lax, many-flowered, with densely downy stalks. Bractees smooth, for the most part very small, but those under the principal subdivisions of the inflorescence are sometimes elongated and lanceolate, and one or two of the lowermost occasionally become very large and leafy. Calyx downy, especially at the base, remarkable for having only two marginal acute segments. Segments of the outer limb of the corolla oblong, equal, coloured green by Mr. Andrews, crimson, like the lip, in Retzius's plate, but the latter is probably accidental, the author having had no living specimen. The lip is longer than those segments, and, like them, externally hairy; its two lobes appear to be sometimes cleft. Stamen long, with a large anther, reddish as well as the style. Fruit globose, purplish.

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purplish-black, with numerous tunicated seeds. This species was raised from seed by A. B. Lambert, eq., at Boyton, in Wiltshire, where it flowered very finely; but it is said to have been previously sent by Mr. Peter Good to Kew, in 1796.

5. *A. alba*. White Alpinia. Rofc. Tr. of Linn. Soc. v. 8. 346. (Hellenia alba; Willd. Sp. Pl. v. 1. 5. Heritiera alba; Retz. Obf. fasc. 6. 18. *Languas vulgare*; Koen. in Retz. Obf. fasc. 3. 64.)—Cluster panicled. Calyx bell-shaped, three-lobed. Lip two-lobed. Leaves callous and fringed at the margin.—Native of China; cultivated in the East Indies. Koenig terms this plant *Galanga alba*, and speaks of it as in much use among the Malays. The roots are white, thicker than the thumb. Stems taller than a man, tuberous at the bottom, a little drooping at the top. Leaves about eighteen inches long, and hardly three broad, two-ranked, smooth on both sides; their edges callous, whitish, and rather rough with hairs. Five or six of the lower sheaths are unaccompanied by leaves. Cluster oblong, with smooth stalks, except the partial ones, which are rather hairy. Bractees lanceolate, acute, rusty-coloured, deciduous. Calyx with snow-white segments. Outer limb of the corolla greenish-white; lip inversely heart-shaped, deeply two-lobed, jagged and crisped at the margin, white, with fine rose-coloured veins. Capsule scarlet, membranous, rather rigid, striated. Koenig's full and correct description of the flower, leaves no doubt as to the genus of this plant, though we have seen no specimens.

6. *A. chinensis*. Chinese Alpinia. Rofc. Tr. of Linn. Soc. v. 8. 346. (Hellenia chinensis; Willd. Sp. Pl. v. 1. 5. Heritiera chinensis; Retz. Obf. fasc. 6. 18. *Languas chinensis*; Koen. in Retz. Obf. fasc. 3. 65.)—Cluster panicled. Calyx bell-shaped, three-toothed, obtuse. Lip emarginate, finely-toothed. Leaves recurved at the point; membranous, and fringed with scattered hairs, at the margin.—Native of China? where at least it is cultivated, for medical use, in gardens. Root aromatic, with an acrid burning flavour, white, as thick as the middle finger. Stems two or three feet high, a little drooping at the summit. Leaves a span long, and two inches or two inches and a half broad, with a white rib and margin. Cluster narrow, three or four inches long, its stalks more or less clothed with clove-pressed hairs. Calyx green. Corolla yellowish; the lip marked with a broad orange-coloured longitudinal stripe, and transverse waves of the same colour, accompanied by four blood-red veins. Fruit a capsule. Koenig.

7. *A. aquatica*. Water Alpinia. Rofc. Tr. of Linn. Soc. v. 8. 346. (Hellenia aquatica; Willd. Sp. Pl. v. 1. 5. Heritiera aquatica; Retz. Obf. fasc. 6. 18. *Languas aquaticum*, l. *lylvestre*; Koen. in Retz. Obf. fasc. 3. 67.)—Panicle somewhat drooping at the top, with forked branches. Calyx bell-shaped, three-toothed. Lip four-toothed, erect; its lateral teeth with an oblong gland at the base, on each side.—Found in marshy places, among bushes, by the sides of rivulets in the East Indies, but not very common. Roots numerous, thread-shaped, white, sending forth runners. Stem about four feet in height; leafy; as thick as the finger. Leaves oblong, acute, coriaceous, of a beautiful green; rather roughly striated on the upper side; smooth at the back; the margin beset with minute callous teeth. Panicle slender, with two deciduous bractees at the base; flower-stalks forked, two-flowered, divaricated, round, smooth, white, shorter than the flowers. Bractees two or three, attached to the lower flower-stalks, linear-lanceolate, concave, membranous, whitish, deciduous. Calyx smooth, pure white, sometimes split at the inner side. Corolla white. Lip small, brown on the inner side,

rose-coloured near its union with the filament. Anther reddish, crowned with a small, coloured, erect, semi-orbicular membrane. Berry oval, smooth, black. Seeds five or more, triangular. Koenig. The membrane crowning the anther forms a small exception to the generic character, but can hardly invalidate it, or require the establishment of a separate genus; unless the fructification, when examined according to our present advanced knowledge, should afford other distinctive marks.

8. *A. malaccensis*. Malacca Alpinia. Rofc. Tr. of Linn. Soc. v. 8. 345. Roxb. n. 3. (Maranta? malaccensis; Willd. Sp. Pl. v. 1. 14. *Burm. Ind. 2. Galanga malaccensis*; Rumph. Amboin. v. 5. 176. t. 71. f. 1.)—Cluster simple, erect. Leaves villous beneath. Lip broader than long, toothed, concave, obscurely three-lobed; lateral lobes incurved.—Native of Chittagong, from whence it was brought to the botanic garden at Calcutta, and flowers there in April and May. "This," says Dr. Roxburgh, "is the most flatly and most beautiful of our Scitamineous plants. The flowers are particularly large; the bractees, and exterior limb of the corolla, pure, smooth, lucid white; the large lip variegated with crimson and yellow." Stem from twelve to fifteen feet high, villous. Leaves eighteen or twenty inches long, the breadth of five or six fingers, silky or downy beneath. Flowers about twelve, alternate. Rumphius, Burmann. This has not yet found its way to England, where it would doubtless be a great acquisition, as, by the above description, it seems to excel the magnificence and beauty of the following.

9. *A. nutans*. Drooping Alpinia. Rofc. Tr. of Linn. Soc. v. 8. 346. Sm. Exot. Bot. v. 2. 93. t. 106. Roxb. n. 4. Ait. n. 4. (Globba nutans; Linn. Mant. 2. 170. Willd. Sp. Pl. v. 1. 153. Redout. Liliac. t. 60. G. *lylvestris*; Rumph. Amboin. v. 6. 140. t. 62, 63. *Renalmia nutans*; Andr. Repof. t. 360. Edwards t. 1. Thort. Illuſtr. t. 13. *Zerumbet speciosum*; Wendl. Sert. Hannover. t. 19. Jacq. Fragn. Bot. t. 68.)—Cluster somewhat compound, drooping. Leaves smooth on both sides. Lip inflated, crisped. Calyx irregularly toothed, tumid, bursting at one side.—Native of the interior parts of Bengal. Roxburgh. Allo of Amboyna, and other places. It was introduced into the English stoves, in 1792, by Sir Joseph Banks, and flowering a few years after, excited the admiration of all beholders. The number of figures of this plant which have been published, prove it a general favourite. The tuberous odorous root is sometimes, as Dr. Roxburgh asserts, brought to England for *Galanga major*; see n. 2. Stem from five to eight feet high in India, but with us twelve to eighteen, perennial, erect, as thick as the finger, leafy. Leaves a foot long or more, with long sheaths, each sheath crowned with a stipula which is externally silky. The flower-buds: before they expand are of a shining white, tinged with rose-colour, and are enveloped in large, concave, toothed bractees of the same porcelain-like splendid whiteness, all together composing a dense pendulous cluster, like a bunch of oblong grapes. When the flowers open, they display the magnificent concave lip yellow at the margin, internally variegated and streaked with every shade of crimson. The stamens and its anther are short and thick. Germs hairy. Capsule spherical, opening at the sides. Seeds aromatic, as is likewise the young germs. Linnæus has greatly confounded the history of this plant, with which he had no acquaintance but from the work of Rumphius. Yet he subsequently cited the same synonym and figures under his *Renalmia exaltata*, which is indeed an *Alpinia*, as we shall presently shew, but a widely different species.

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The real genus *GLOBBA* is totally distinct from both; see that article.

10. *A. nutica*. Pointless Narrow-leaved *Alpinia*. Roxb. n. 5.—Cluster erect, compound. Leaves shortly stalked, linear-lanceolate, polished. Lip three-lobed; without a spur at the base. Capsule pulpy. Seeds numerous, angular, with an evanescent tunic.—Found by Mr. W. Roxburgh, the son of our ever-lamented East Indian botanist, in the forests of Prince of Wales's island, from whence being brought to the Calcutta garden, it flowered, more or less, during the whole year, but chiefly in the hot season, March, April, and May. This is also an elegant species, and holds a middle rank between *nutans* and *calcarata*. *Roxburgh*.

11. *A. calcarata*. Spurred Narrow-leaved *Alpinia*. Rofc. Tr. of Linn. Soc. v. 8. 347. Roxb. n. 6. Ait. n. 5. (*Renealmia calcarata*; Andr. Repof. t. 421. *Globba erecta*; Redout. Liliac. t. 174.)—Cluster erect, somewhat compound. Leaves linear-lanceolate, polished. Lip ovate-oblong, cloven at the point. Segments of the outer limb linear-oblong.—Native of China, from whence it was introduced into the Calcutta garden in 1799, according to Dr. Roxburgh, who communicated the plant to Mr. Lambert. The numerous stems are from three to five feet high. *Leaves* narrow, acute, smooth. *Cluster* three or four inches long, downy, rather dense, the stalks, though partly compound, some of them bearing two or three flowers, being so short that the whole cluster resembles a spike. *Leaves* twelve or fifteen inches long and one broad, pointed. *Bractææ* elliptical, concave, hardly equal to the *calyx*, which is tubular, white, split half way down at one side, and on the other very slightly and bluntly notched. Outer limb of the *corolla* pure white, the length of the tube, in three deep, equal, obtuse, flat, rather narrow segments. *Lip* nearly twice as long, concave, but not so tumid or inflated as in *A. nutans*; its upper side crimson, beautifully streaked; the extremity flattish, slightly cloven, more or less notched or curled. The base of the *lip* being furnished, as in *A. nutans* and some other species, with two small spurs, or awl-shaped appendages on the upper side, which are wanting in the last, seems to have occasioned the specific name, which is rather calculated to mislead. Dr. Roxburgh had once an intention of changing it to *spicata*, which would not have been more correct, and the above being printed by Andrews, it was suffered to remain. *A. angustifolia* would have been preferable to either.

12. *A. maculata*. Spotted-leaved *Alpinia*. Rofc. Tr. of Linn. Soc. v. 8. 347.—“Leaves ovate, spotted.”—Cultivated in the botanic garden at Liverpool. It is thus mentioned by Mr. Roscoe, but with a mark of doubt, nor have we met with any further information respecting this species.

13. *A. spicata*. Small Spiked *Alpinia*. Roxb. n. 8.—“Spike oblong, compactly imbricated, with narrow-lanceolate acute bractææ.”—Native of Sumatra. Brought by Mr. William Roxburgh, from Bencoolen to the Calcutta garden, in 1803. At the close of the rains of 1808, it blossomed for the first time, and was then only about two feet high, being the smallest of the genus ever seen by Dr. Roxburgh. This is all the account he has left us of the present species.

14. *A. Renealmia*. Surinam *Alpinia*. (*Renealmia exaltata*; Linn. Suppl. 79, excluding the synonym of Rumphius, and the account of the stem and leaves taken from that author. Willd. Sp. Pl. v. 1. 6. “*Neue Bot. Ann.* v. 3. 136.” *Myrsina* n. 64; Linn. Pl. Surinam. in *A. moen. Acad.* v. 8. 251. n. 3, excluding the synonym of

Merian, t. 54.)—Cluster lateral, compound. Calyx tubular, irregularly toothed.—Native of Surinam. The history of this plant is so confused, that we think it necessary to lay before the reader all the original materials. The generic description, Linn. Suppl. 7, and the specific one, p. 79 of the same work, beginning at the word *Racemus*, appear to have been made, with sufficient accuracy and fidelity, from specimens of a cluster of the *flowers*, and a quantity of the *fruit*, with a *leaf*, sent in bottles of spirits to Linnæus. The former was taken out and dried by Linnæus himself, for his herbarium, where it now lies, marked by him *Heliconia*, he having taken this specimen for Merian's t. 54, *Heliconia Bibat*, which it somewhat resembles in general aspect. The *flowers*, however, when examined, prove these plants totally different; but this mistake of Linnæus accounts for his erroneous reference to Merian. The spirits in the bottle of the *fruit* being gone, the latter is also dried; but enough remains to shew it has been a fleshy, very fibrous, oval, *capsule*, above an inch long, of three valves, strongly umbilicated, and containing numerous, roundish-obovate *seeds*, now of a shining brown. Their flavour is lost. A Dutch manuscript, sent from Surinam with the collection to which the above belonged, contains the following information. “No. 64 is a sort of reed, and has upon each stalk four such leaves as are here to be seen; two uppermost next to each other, and then the other two a span under the uppermost, and a span between these two, downwards to the fruit. The fruit is at first red; black when ripe. The seed in the fruit tastes exactly like Cardamom. The stalk to which the fruit grows is two feet and a half long, beset with twenty-five to twenty-seven fruits.” Such is as literal a translation as we could obtain. It seems undubitably to ascertain the situation of the *inflorescence* to be lateral, and in this point agrees with the following account given by Willdenow, we know not on whose authority. “A tree twenty feet high. *Leaves* five or six feet long, lanceolate, waved at the margin. The *cluster* originates from the *trunk*, above the root.” *Neue Bot. Ann.* as above. If this last description really belongs to the Linnæan *Renealmia*, our ideas of the plant are very incomplete. The lateral *inflorescence* would form a strong presumptive argument against its being an *Alpinia*; but we can assert, from a careful examination of one of the *flowers*, immersed in hot water, and compared with a living flower of *A. nutans*, that their structure agrees exactly, without the least mark of a generic difference, especially the essential part of the *anther*. This indeed appears from Linnæus's remarks in the *Supplementum*, without which our history would be incomplete. We shall leave the reader to compare it with the descriptions of other species, only observing beforehand that Linnæus considers the flower as reversed, placing the *nectary* uppermost.

Suppl. p. 7. *RENEALMIA*. Eff. Ch. *Corolla* three-cleft. *Nectary* oblong. *Calyx* of one leaf. *Anther* sessile, opposite to the *nectary*. *Berry* fleshy.

Nat. Ch. *Cal.* Perianth superior, tubular, of one leaf, bursting at the top into two or three irregular teeth. *Cor.* of one petal. Tube straight, cylindrical. Limb three-cleft: two upper (properly under) segments oblong, rounded, equal: lower segment scarcely longer, channelled, oblong. *Nectary* united with the tube, ascending under the upper segments, straight, the length of the corolla, oblong, with a tooth at the base on each side, and a hollow behind; dilated, and bluntly three-lobed, at the extremity. *Stam.* Filament none. *Anther* solitary, inserted into the mouth of the tube, in the bosom of the lower (upper) segment of the corolla, opposite to the *nectary*, unconnected, straight, linear,

linear, emarginate, marked with a furrow on the inner side, its length and breadth equal to the segment of the corolla. *Pist.* Germen inferior, oblong, obscurely triangular, smooth. Style thread-shaped, very smooth, erect; the length of the corolla. Stigma peltate, a little flat head, abrupt on the side towards the nectary, an orifice running into the style. *Peric.* Berry oblong, round, with three furrows, smooth, fleshy, with an umbilicated termination; three-celled in the centre; the cells soft and membranous. *Seeds* numerous, oblong, abrupt, quadrangular, very smooth.

P. 79. *R. exaltata.* Cluster with alternate, lanceolate, channelled, smooth, ribbed, deciduous bracteas. *Flower-stalks* in the bosoms of the bracteas, solitary, incurved, depressed, downy, short, each terminating in a sheath of one leaf, which bursts at the top, like the calyx, into two or three segments, to allow the flowers to protrude. Within this sheath is a flower, as well as another two-flowered sheath, so that each stalk bears three flowers. The calyx is exactly similar to these sheaths, inasmuch that it would be a sheath, if not feated on the top of the germen. Scarcely any other of the *Scitamineæ* has an anther so unconnected, and with so much of the common appearance of that organ. The fruit forms a compound pendulous cluster, resembling the fruit of *Momordica Elaterium* in size and figure; its cortical part thick and fleshy, hot, reddish; the triangular central cell has soft, juicy, membranous partitions. *Seeds* small, very smooth, black, very like those of *Anomium Cardamomum*. The preserved fruit is esteemed by the inhabitants of Surinam.

The following three species are lately added to *Alpinia* by Mr. Roscoe, from the inspection of some Chinese drawings, in the possession of the right honourable lord Stanley, V.P.L.S.

15. *A. pennicellata.* Pencilled *Alpinia*. Rofc. Tr. of Linn. Soc. v. 11. 280.—Cluster terminal, pendulous. Segments of the outer limb short, pointed. Lip emarginate. Leaves lanceolate, simple at the margin.—Native of China. The lip or nectary is broad, simple, emarginate, bright yellow regularly streaked with crimson. Leaves regularly nerved. The unfolded blossoms have, like some other species, the appearance of fine China ware.

16. *A. diffusa.* Cloven *Alpinia*. Rofc. *ibid.*—Cluster inclining. Segments of the outer limb ovate. Lip flat, panduriform. Leaves lanceolate, glaucous beneath. Stamen deeply cloven to the base.—Native of China. The margin of the leaves is strongly nerved. Lip broad, bright yellow, with a central rib, from which diverge crimson streaks. The filament is deeply cloven, each portion bearing its proper anther, (or rather we should say, one lobe of the anther,) between which rises the style, perfectly free, and not inclosed in a double anther, as in the rest of the proper *Scitamineæ*. This circumstance is so peculiar, that Mr. Roscoe thinks it may possibly entitle the plant to rank as a new genus; but being in other respects truly an *Alpinia*, he prefers retaining it here.

17. *A. bracteata.* Braçateated *Alpinia*. Rofc. *ibid.* 281.—Panicle loose. Leaves downy. Lip in three, nearly equal, lobes; spurred at the base.—From the same country. The stem is jointed, rather spiral. Footstalks of the upper leaves uniting with the bracteas. Calyx concave, ovate. Nectary broad, flat, nearly circular, deeply indented at each side, yellow, with purple rays diverging from its base. Anther ovate. "Habit rather of a *Costus* than an *Alpinia*, but the inflorescence is a loose panicle, not a bracteated spike, and the whole construction of the corolla seems decisive of the genus." Rofcoe.

A. Cardamomum, Roxb. n. 7, the valuable Cardamom

of the shops; *Anomium repens* of Sonnerat and other authors, Willd. Sp. Pl. v. 1. 9; is now properly, we believe, removed from *Alpinia*, and proposed by Dr. Maton, Tr. of Linn. Soc. v. 10. 249, as a new genus, distinguished by two transverse processes at the top of the filament, and called by him ELETTERIA, under which name we propose hereafter to treat of this plant.

ALQUIER. Add—The fanega, which is the 15th part of the moyo, is = 4 alquiers = 8 moyos = 16 quarters = 32 outavas = 64 mequias. The alquier measures 675 French, or 817 English cubic inches; so that 21 alquiers are nearly = 1 English quarter; or, more correctly, 50 alquiers = 19 English bushels.

ALSOPHILA, in Botany, so named, we presume, from *αλωε*, a grove, or forest, and *φιλον*, to love; alluding to the favourite situation of the beautiful tribe of Tree Ferns, to which this belongs.—Brown Prodr. Nov. Holl. v. 1. 158.—This genus is founded on our *Cyathea aspera*, *C. extensa* of Swartz, *Polypodium lunulatum* of Forster, and some other allied species; but we scarcely think the deeper segments of the bursting involucre, or the situation of the *fori* at the division, instead of the side, of a vein, can authorize a separation of these from CYATHEA. See that article.

ALSTEAD, in Geography, a town of America, in New Hampshire, and county of Cheshire, having 1694 inhabitants.

ALSTONIA, in Botany, received that name from Mr. Brown, in memory of Dr. CHARLES ALSTON, formerly Professor of Botany at Edinburgh. (See that article.) The genus originally dedicated to this gentleman, in the Supplement of Linnæus, is now sunk in SYMLOCOS. (See that article, and ALSTONIA.)—Brown Tr. of the Werner. Soc. v. 1. 75.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Coniaria*, Linn. *Apocinea*, Juss. Brown.

Gen. Ch. Cal. Perianth inferior, of one leaf, small, in five deep, rather blunt, tubegments, permanent. Cor. of one petal, falver-shaped; tube cylindrical, many times longer than the calyx, somewhat tumid near the top, pervious, destitute of scales in the throat or mouth; limb horizontal, in five deep segments, folding over each other at the base, mostly shorter than the tube. Nectary none. Stam. Filaments five, short, inserted into the tube, and not reaching to its summit; anthers lanceolate, unconnected with the stigma, bursting longitudinally, enclosed within the tube. *Pist.* Germens two, simple; style solitary, central, thread-shaped, swelling at the top; stigma nearly conical. *Peric.* Follicles two, cylindrical, long, each of one cell and one valve. *Seeds* oblong, peltate, fringed, bearded with long hairs at each end.

Ess. Ch. Corolla falver-shaped, pervious; limb in five deep oblique segments. Nectaries none. Anthers lanceolate, within the tube, bursting lengthwise, unconnected with the stigma. Follicles two, cylindrical. Seeds fringed, bearded at each end.

This genus consists of trees, often of great height, with milky juice. Leaves either whorled or opposite, ribbed, smooth. *Cymes* terminal, panicled. Flowers for the most part white. Follicles generally very long. They grow in the East Indies, the Malay Archipelago, and the Society islands. *Alstonia* has little affinity to ECHITES, (see that article,) with which Linnæus would probably not have confounded it, had he examined the fruit, or attended to the figure in the Hort. Malab., of which work indeed he had not a copy. Brown.

1. *A. scholaris.* Tablet *Alstonia*. Br. n. 1. (Echites scholaris; Linn. Mant. 53. Willd. Sp. Pl. v. 1. 1241. Lignum scholaræ; Rumph. Amboin. v. 2. 246. t. 82. Pala;

Pala; Rheede Hort. Malab. 81. t. 45, not 46.)—Leaves several in each whorl, obovate-oblong, obtuse, ribbed, furrowed with a marginal vein. Cymes stalked. Limb of the corolla but partially bearded. Follicles very long and slender.—Native of Malabar and the Molucca islands, in sandy ground, flowering in January. A very tall and spreading tree, whose wood, Rumphius tells us, is used by school-boys in India, as slates are with us. The leaves are from five to seven in each whorl, stalked, with numerous, parallel, transverse veins, or ribs. Cymes many-flowered, compound, spreading, downy. Flowers small, about half an inch long, whitish, sweet-scented, but oppressive to the head. Corolla downy on the inside and out, but not densely bearded, or shaggy, except around the mouth. Follicles eighteen inches long, not so thick as a wheat straw. Seeds furnished at each end with a tuft of very long silky hairs.

2. *A. spectabilis*. Handsome *Altonia*. Br. n. 2.—“Leaves four in a whorl, elliptic-oblong, ribbed, somewhat pointed, without any marginal vein. Cymes stalked, shorter than the leaves. Limb of the corolla bearded. Follicles very long.”—Observed by Mr. Brown, in April 1803, in the island of Timor, near Coepang, bearing flowers and fruit. Very nearly akin to the foregoing, but distinct; not ill-represented by Rumphius’s plate, t. 82, but his description agrees best with *A. scholaris*. Brown. We would observe, that the number of the leaves in this figure agrees best with *scholaris*, and that the omission of the marginal nerve, so little conspicuous in nature, is rather to be attributed to inaccuracy of the engraver, if not of the draughtsman.

3. *A. venenata*. Poisonous *Altonia*. Br. n. 3.—Leaves four in a whorl, lanceolate, pointed; tapering at the base. Cymes forked. Tube of the corolla swelling upwards. Limb beardless, shorter than the tube. Follicles tapering at each end, scarcely so long as the leaves.—Native of the East Indies. Dr. Roxburgh. We received a specimen from the Rev. Dr. Rottler, gathered at Nundydroog, March 17, 1806. The leaves are crowded towards the ends of the branches, stalked, very smooth, three inches or more in length. Flowers like those of a *Tabernemontana*, their limb an inch broad, with oblong, oblique, rather blunt than acute segments; tube an inch and a half long, inflated in the upper part, very smooth, as well as the limb. The calyx is a little downy, or fringed. Flower-stalks quite smooth. We have not seen the follicles.

4. *A. costata*. Ribbed *Altonia*. Br. n. 4. (Echites costata; Forst. Prodr. 20, excluding the synonym. Willd. Sp. Pl. v. 1. 1240.)—“Leaves opposite, elliptic-oblong, pointed, ribbed. Cymes loose. Segments of the limb lanceolate, beardless, longer than the tube. Follicles very long.”—Native of the Society Isles. Forster. Gathered by Sir Joseph Banks in Otahitè and Ulaieta, between the summits of hills (called by the natives *Atahé*). Brown. We presume the plant, not the hills. A moderate-sized tree. The seeds are fringed, but, according to Mr. Brown, the silky hairs at each end are not so remarkably elongated as in other species. Kametti-Valli, Hort. Malab. v. 9. t. 14, is a climber, having short follicles, with winged naked seeds, and therefore cannot, as Forster thought, be synonymous with this.

ALTAI MOUNTAINS. See ALTAI.

ALTERNANTHERA, in Botany, so called by Forskall, from the stamens being, as he thought, alternately furnished with anthers, and without them.—Forsk. Ægypt.-Arab. 28. Brown Prodr. Nov. Holl. v. 1. 416.—Class

and order, *Pentandria Monogynia*. Nat. Ord. *Holeraceæ*, Linn. *Amaranthi*, Juff.

Gen. Ch. Cal. Perianth inferior, of one leaf, in five deep, coloured, pointed, spreading, permanent, and finally hardened, segments. Cor. none. Stam. Filaments five, capillary, shorter than the calyx, inserted into a membranous ring, surrounding the base of the germen, with more or less remarkable intermediate teeth; anthers simple, oval, of one cell, generally wanting on two or three of the filaments alternately. Pist. Germen ovate, acute; style very short; stigma capitate. Peric. Capsule membranous, inversely kidney-shaped, compressed, of one valve and one cell, inflated, not bursting, enclosed in the cartilaginous calyx. Seed solitary, roundish, pointed.

Eff. Ch. Calyx in five deep segments, cartilaginous. Corolla none. Stamens partly imperfect, inserted into a membranous ring, with intermediate teeth. Anthers single-celled. Stigma capitate. Capsule kidney-shaped, of one cell, without valves. Seed solitary.

Obs. Mr. Brown properly retains the name of *ILLECEBRUM*, (see that article,) for *I. verticillatum* and its allies, from which we can scarcely separate *I. Paronychia*, &c. He would divide the present genus, which agrees very nearly in habit with *Illecebrum*, into two sections. These we shall here adopt, according to his suggestion, for the distribution of the species.

SECT. 1. Two of the filaments deprived of anthers. Intermediate teeth very short, or obsolete.

1. *A. sessilis*. Sessile-flowered *Alternanthera*. Fork. Ægypt.-Arab. 28. (*Illecebrum* sessile; Linn. Sp. Pl. 300. Mant. 345. Willd. Sp. Pl. v. 1. 1209. Ait. Hort. Kew. v. 2. 61. Vahl Symb. v. 1. 22. *Amaranthoides humile maderasatanum*, capitulis candicantibus, folio molli; Pluk. Phyt. t. 133. f. 1. *Amaranthus humilis*, foliis oppositis, flosculis in alis conglomeratis; Burm. Zeyl. 17. t. 4. f. 2.)—Calyx smooth; segments ovate, pointed, almost twice the length of the capsule. Leaves elliptic-lanceolate, nearly entire, bearded at their insertion. Stem procumbent, hairy on two opposite sides.—Native of Arabia and the East Indies. A biennial, or perhaps annual herb, whose branching stems spread on the ground, in every direction, to the length of a foot or more, and are leafy, bluntly quadrangular; the opposite furrows densely hairy. Leaves opposite, stalked, spreading or reflexed, from one to two inches long, bluntnish, nearly or quite entire, single-ribbed, smooth, bright green, rather fleshy. Footstalks very short, bearded, and connected by intermediate stipulaceous bristles. Heads of flowers sessile, axillary, solitary, obtuse, half an inch, more or less, in length, white and shining, like everlasting flowers. Calyx single-ribbed, strongly keeled, pellucid. Capsule broadly heart-shaped, finely reticulated. The leaves occasionally vary to an obovate, or spatulate figure.

2. *A. denticulata*. Toothed *Alternanthera*. Br. n. 1.—Calyx smooth; segments ovate, pointed, almost twice the length of the capsule. Leaves narrow-lanceolate, finely toothed, smooth; bearded at their insertion. Stem procumbent, smooth.—Gathered by Mr. Brown in the tropical part of New Holland, as well as in New South Wales, and Van Diemen’s island. We have seen no specimen.

3. *A. nodiflora*. Knotty-flowered *Alternanthera*. Br. n. 2.—Calyx smooth; segments narrow-lanceolate, pointed, thrice the length of the capsule. Leaves linear-lanceolate, finely toothed, smooth; bearded at their insertion. Stem diffuse, square, smooth; its ultimate branches only downy on two opposite sides.—Discovered by Mr. Brown, in the tropical district of New Holland. These three species appear to be all nearly allied.

4. *A. angustifolia*. Narrow-leaved Alternanthera. Br. n. 3.—Calyx externally woolly; segments ovate, acute, the length of the capsule. Heads nearly globose. Leaves linear, very smooth. Stem erect, angular.—Found by Mr. Brown, in the tropical part of New Holland.

5. *A. nana*. Dwarf Alternanthera. Br. n. 4.—Calyx smooth; segments ovate, slightly pointed, twice the length of the capsule. Leaves obovate-oblong, hairy; tapering at the base. Stem diffuse, hairy.—Found in the same country as the two last, by Mr. Brown.

SECT. 2. *Five of the filaments with perfect anthers; five intermediate ones conspicuous, without any.*

6. *A. Achyrantha*. Creeping Alternanthera. (Illecebrum Achyrantha; Linn. Sp. Pl. 299. Willd. Sp. Pl. v. 1. 1208. Ait. Hort. Kew. v. 2. 61. Achyrantha repens, foliis bliti pallidi; Dill. Elth. 8. t. 7. f. 7.)—Stem creeping. Leaves ovate; densely downy when young. Calyx with somewhat spinous points.—Native of Buenos Ayres, from whence it was sent to Sherard, before the year 1732. We have specimens from the Paris garden. There is reason to doubt whether Linnæus ever saw this species.

The root is perennial. Stems prostrate, from one to two feet long, repeatedly forked, leafy, most hairy at opposite sides, creeping by means of fibrous radicles from their lower joints. Leaves stalked, from one to two inches long, entire; nearly smooth, and of a bright green, when full-grown; the young ones covered on both sides with dense, itarry, hoary hairs, such as compose the pubescence of the stems, and especially of the younger branches. Heads small, from the forks of the stem, partly stalked, round, of but few flowers. Calyx brownish-white; segments three-ribbed, unequal, strongly keeled, partly hairy, accompanied as it seems occasionally with smaller smoother scales.

7. *A. polygonoides*. Persicaria-leaved Alternanthera. (Illecebrum polygonoides; Linn. Sp. Pl. 300. Willd. Sp. Pl. v. 1. 1208. Ait. Hort. Kew. v. 1. 61. Herniaria hirsuta repens, ad nodos alternos florida; Browne Jern. 184. Amaranthoides humile curassavicum, foliis polygoni; Herm. Par. 17, with a figure. Sloane Jam. v. 1. 141. t. 86. f. 2. A. marina hirsuta, halimi folio; Plum. Ic. 12. t. 21. f. 2.)—Stem creeping, hairy. Leaves elliptic-lanceolate, tapering at the base, stalked, all smooth. Calyx ovate, single-ribbed, unarmed; hairy at the bottom.—Native of South America. A smaller plant than the preceding, except the flowers; with longer, much narrower, leaves smooth at every period of their growth, on long stalks. Calyx of a brilliant white; its segments ovate, pointed, but not spinous, the mid-rib less prominent than in the foregoing; the base only beset with conspicuous hairs. Plumier's plant scarcely requires to be called a variety. The stem indeed is represented more hairy than it appears in our gardens, but it is always more or less so, and the hairs are always simple, not flattened like those of *A. Achyrantha*.

8. *A. ficoidea*. Ribbed Alternanthera. (Illecebrum ficoideum; Linn. Sp. Pl. 300. Willd. Sp. Pl. v. 1. 1208. Gomphrena ficoidea; Linn. Sp. Pl. ed. i. 225. Jacq. Amer. 88. t. 60. f. 4.)—Stem creeping, smooth. Leaves ovate-lanceolate, tapering at the base, stalked. Calyx lanceolate, unarmed, three-ribbed, hairy at the back.—Native of South America. Cultivated by Linnæus at Upsal, Jacquin's figure more resembles the last, closely according with Browne's specimen, which indeed Dr. Solander, who sent it to Linnæus, marked *Gomphrena ficoidea*; but the latter found it to be his own *Illecebrum polygonoides*. The plant before us, from the Upsal garden, is a truly distinct species, with broader leaves, an inch and a half or two inches long, roughish with callous points; a smooth stem; and very

different flowers. The segments of the calyx are much narrower, brown at the base, with three strong ribs, and clothed at the back, more than half way up, with prominent hairs; their points are tapering, but not spinous.

Mr. Brown speaks of some American nondescript species, referable to this section. Whether the following be among them we know not, but they appear to be nondescript.

9. *A. villosa*. Woolly-branched Alternanthera.—Stem decumbent, hairy; shaggy at the joints. Leaves obovate, stalked, nearly smooth. Calyx ovate, single-ribbed, smooth.—Sent to Linnæus by Thouin, from the Paris garden, without any mention of its native country. Stems above a foot long, with ascending very hairy branches, bent at each joint. Leaves an inch or more in length, bluntish, dotted, rarely besprinkled with a few long hairs. Footstalks accompanied, above their insertion, with very dense stipular tufts, of long shaggy hairs, jointed, like all those on the stem and foliage. Of the flowers we have seen only one small axillary head, apparently not come to perfection, but its glumes are evidently unlike all the preceding, broadly ovate, even and smooth, acute but not spinous, with a simple mid-rib.

10. *A. echinata*. Prickly-headed Alternanthera.—Stem prostrate, hairy. Leaves roundish-oval, smooth. Calyx spinous-pointed; outer segments lanceolate, elongated, partly three-ribbed, smooth; two inner shorter, gibbous, hairy at the back.—Gathered by Commerçon at Monte Video, and sent by Thouin to the younger Linnæus. This remarkable species is among the largest we have seen. The leaves indeed are not above an inch long, but they are nearly as much in breadth, tapering at the base, their surface dotted with little points, not hairy. Heads sessile, axillary, somewhat aggregate, globose or oblong, pale brown, shining, distinguished by the length and sharp thorns of their three outer calyx-segments, one of which is strongly three-ribbed, and by the tufted hairs of the two inner ones, projecting very conspicuously between them.

ALTMICKLIC, in Commerce, a Turkish silver coin = 60 paras.

ALTON, in America. Add—The town contains 1279 inhabitants.

ALTUN-KUPRI, or the Golden Bridge, a town of Persia, in the pachalic of Bagdad, about the size of Kupri, (which see,) situated on a fine plain, on the northern bank of the Little Zab, 32 furlongs from Mosul.

ALUMINA, in Chemistry, an earthy substance, described as elementary, but which Sir Humphrey Davy has rendered probable to be a compound of a metallic basis with oxygen. See ALUMINUM *infra*.

We have little to add to the description of alumina, except the curious fact observed by Sauffure, that this substance does not give out the peculiar earthy smell which has been considered as characteristic of it, except it be mixed with oxyd of iron.

ALUMINA, Salts of, the compounds formed by the different acids with alumina. By some accident, the description of most of the salts of alumina has been omitted. We shall therefore take the opportunity of introducing them here.

Nitrate of Alumina. See NITRATE of Alumina.

Carbonate of Alumina. The existence of this salt has been usually admitted by chemists. Bergman, however, could not form it artificially, though he allows its existence, because when alum is mixed with an alkaline carbonate, part of the alumina remains in solution till the carbonic acid be driven off. Sauffure has more recently shewn, that water saturated with carbonic acid is capable of dissolving alumina, but that this combination is destroyed by simple exposure to the air. Carbonate of alumina, therefore, cannot exist in a dry

dry flate. What had formerly been considered as dry carbonate of alumina is a triple compound of alumina, carbonic acid, and the alkali employed in precipitating the alumina.

Phosphate of Alumina. This salt may be formed by saturating phosphoric acid with alumina. According to Fourcroy, who is the only chemist that has examined it, the phosphate of alumina is a tasteless powder, infoluble in water. When diffused in excess of phosphoric acid, it yields a gritty powder and a gummy solution, which by heat is converted into a transparent glass.

Sulphate of Alumina. See ALUM and SULPHATE of Alumina. In addition to what has been said under these articles, we may add the following analysis of alum by Vauquelin, Thenard and Roard, and Berzelius.

	Vauquelin.	Thenard and Roard.	Berzelius.
Sulphuric acid	30.52	26.04	34.23
Alumina -	10.50	12.53	10.86
Potash -	10.40	10.02	9.81
Water -	48.58	51.41	45.00
	100.00	100.00	99.90

The analysis of Berzelius is probably most accurate, and is equivalent to

Sulphate of alumina - - -	36.85
Sulphate of potash - - -	18.15
Water - - - - -	45.00
	100.00

Which nearly coincides, according to Dr. Thomson, with three atoms of sulphate of alumina, one atom of sulphate of potash, and twenty-three atoms of water.

According to the experiments of Thenard and Roard, alum usually contains a little sulphate of iron, and the goodness of its qualities as a mordant in dyeing, according to these chemists, depends entirely upon the proportion of that salt present. The more free it is from it the better. The purest alum examined contained about $\frac{1}{2000}$ th part of its weight of sulphate of iron; the impure about $\frac{1}{1000}$ th. When freed from sulphate of iron, every species of alum tried acts exactly in the same manner as a mordant.

Sulphite of Alumina. See SULPHITE of Alumina.

Borate of Alumina. This salt may be formed by mixing together the solutions of borate of soda and sulphate of alumina. It is said to be scarcely soluble in water.

Arsenate of Alumina. See ARSENATE of Alumina.

Tungstate of Alumina. A white powder infoluble in water.

Acetate of Alumina. See ACETATE of Alumina.

Benzoate of Alumina. This salt crystallizes, is soluble in water, and deliquesces on exposure to the air.

Succinate of Alumina. Wenzel states, that this salt crystallizes in prisms, and is easily decomposed by heat.

Camphorate of Alumina. This salt may be formed by heating together newly precipitated alumina and camphoric acid. It is a white powder, of an acid bitterish taste, and slightly astringent. Water dissolves about $\frac{1}{1000}$ th part of its weight of this salt: it is not soluble in boiling water, but separates as the water cools. Cold alcohol dissolves very little of it; but by the assistance of heat that fluid takes up a considerable quantity, which separates on the cooling of the alcohol. This salt undergoes but little change from the action of the air. Exposed to heat the acid volatilizes; and when the salt is thrown on burning coals it takes fire, and burns with a blue flame.

Suberate of Alumina. This salt does not crystallize. It has a yellowish colour, and always contains an excess of acid. On exposure to the air it attracts moisture. When heated the acid is volatilized, and the alumina left in a state of purity.

Oxalate of Alumina. Oxalic acid readily dissolves alumina, and forms an uncrystallizable deliquescent salt, with excess of acid, of a yellowish colour, and sparingly soluble in alcohol. It is said to be composed of

Oxalic acid and water - -	56
Alumina - - - - -	44
	100

Mellate of Alumina. This salt exists in the form of a white flaky powder.

Tartrate of Alumina. See TARTRATES.

Tartrate of Potash and Alumina. This triple salt may be formed by saturating tartar with alumina. It nearly resembles the last salt. Neither the alkalies nor alkaline carbonates, according to Thenard, produce precipitates in this salt.

Saccharate of Alumina. A white powder, infoluble in water.

Urate of Alumina. A white powder, closely resembling in its appearance the uric acid.

Malate of Alumina. This salt is almost infoluble in water; hence Mr. Chenevix has proposed the malic acid as a means of separating alumina from magnesia.

Sorbate of Alumina. From the experiments of Mr. Donovan, the discoverer of sorbic acid, it appears that this salt has no existence.

Zumate of Alumina. A gummy mass, not altered by exposure to the air.

Gallate of Alumina. According to sir Humphrey Davy, a solution of galls, in which alumina has been diffused, deposits after some time transparent prismatic crystals, which are the super-gallate of alumina. The quantity of alumina they contain is so small as not to disguise the properties of the acid.

Dr. Thomson is disposed to consider the salts of alumina in general as composed of one atom of alumina and one atom of the respective acids, and if this be admitted their composition may be readily ascertained.

With respect to the uses of the salts of alumina, see ALUM, DYEING, MORDANT, TAWING, &c.

ALUMINITE. See MINERALOGY, *Addenda*.

ALUMINUM, in *Chemistry*, the metallic basis of alumina. Sir Humphrey Davy shewed, that when potassium is passed through alumina heated to whiteness, a considerable proportion of it is converted into potash, and grey metallic particles are perceived in the mass, which effervesce in water and air, and are converted into alumina. When a globe of iron is fused by galvanism in contact with moist alumina, it forms an alloy with aluminum, which effervesces slowly in water, and becomes covered with a white powder. These metallic particles Davy considered as the basis of alumina, and in conformity to this view denominated it *aluminum*. The above, however, is all we know at present respecting this metal.

ALYXIA, in *Botany*, (see GYNOPOGON,) which latter will probably give way, as in such a case it ought, being founded in error, to the former. Brown Prodr. Nov. Holl. v. 1. 469.

AMADAN. Add—The present town contains in 10,000 meanly-built houses more than 40,000 inhabitants. It is famous

famous for its manufacture of leather; and it is also a mart of commerce between Ispahan and Bagdad, and between Bagdad and Tekroun. N. lat. 35° 51'. E. long. 48°.

AMADIA, Add.—This town does not contain above 600 houses; but the plain, at the foot of the hill, is covered with dependent villages. It is nominally dependent upon the pacha of Bagdad, but pays him no tribute.

AMANDA, a township of Ohio, in the county of Fairfield, having 836 inhabitants.

AMANITA, in *Botany*, *αμανίτις*, an old Greek name for *Fungi* in general, is used by Haller, after Dillenius, for the whole Linnean genus of *AGARICUS*, (see that article,) or nearly so. Perfoon adopts it for such species only as are furnished with a *volva*, which, on that account, he considers generically distinct.—Perf. Syn. Fung. 246.—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Eff. Ch. Stalk with a wrapper at the base. Head fleshy. Gills crowded, nearly undivided.

Obf. The head is generally warty, and the stalk elongated, either naked, or furnished with a ring. Perfoon describes seventeen species, partly wrong numbered, all which, being more or less remarkable, and some of them very much so, we shall in order enumerate, with the addition of one.

SECT. 1. Stalk surrounded at the base with a distinct wrapper; but destitute of a ring at the top.

1. *A. livida*. Livid Egg-Agaric. Perf. Disp. Meth. 66. (*Agaricus plumbeus*; Schæff. Fung. v. 4. 37. t. 85, 86. With. Bot. Arr. v. 4. 244. Fl. Dan. t. 1014. *A. vaginatus*; Bulliard t. 512. f. M, according to Perfoon.)—Head bossed, flatfish, striated, livid lead-coloured. Gills white, as well as the long stalk.—Not uncommon in autumn, after rain, about the skirts of woods, and borders of fields. The wrapper bursts irregularly. The stalk is hollow, and rather long in proportion, about twice the diameter of the head, which is protuberant and brownish in the middle, greyish-lead-coloured and striated at the margin. Some individuals are much thicker than others. Schæffer gives a good representation of the various states and forms of this species. The head is sometimes studded with angular warts, at least when young, as represented by Battarra, *Leucomyces gemmatas*, Batt. Fung. Arim. 28. t. 6. f. B. commended highly in Withering; and by Micheli, t. 78. f. 2. These figures exhibit a state and habit of the plant, the reverse of what appears in the *Fl. Dan.* and especially in Bulliard. This is generally allowed to be a poisonous fungus. Some varieties are indicated by Perfoon, one with yellowish gills, Schæff. t. 244; and another with a browner head, and tapering stalk, found in fir woods, which seems to connect the present with the following species.

2. *A. spadicea*. Tawny-brown Egg-Agaric. Perf. Disp. Meth. 66. (*Agaricus badius*; Schæff. Fung. v. 4. 63. t. 245. With. v. 4. 227. *A. fulvus*; ib. t. 95. *A. vaginatus*; Bulliard t. 512, f. N?)—Head somewhat bell-shaped, bossed, striated, brittle, orange-brown. Gills white. Stalk pale brown, scaly.—Found in dry woods, about August, in various parts of England and Germany. Akin to the foregoing, but much more delicate in texture. We should scarcely think it more than a variety.

3. *A. incarnata*. Flesh-coloured Egg-Agaric. Perf. n. 3. (“*Agaricus incarnatus*; Batich. Elench. Fung. 51.” *Fungus magnus esculentus*; e. volva erumpens, pileolo villosulo albo, lamellis carneis, pediculo cylindrico glabro, pariter albo; Mich. Gen. 182. t. 76. f. 1; not f. 2 as Perfoon has it.)—Head hemispherical, white, hairy. Gills flesh-coloured. Stalk white, cylindrical.—Found by Micheli, on old half-decayed trees, in the woods of Viareggio near Florence, in

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June. No other botanist seems to have met with this fungus; at least not in the state described by Micheli. He represents it of very large dimensions, the head full six inches broad, while in its convex state, and covered with fine hairs. Wrapper much divided and jagged, tumid. Stalk six inches high, smooth, thick, and very straight.

Albertini and Schweiniz, in their very learned *Conspectus Fungorum*, 142, speak of what they deem a variety of this, whose head is smooth, scarcely bearing any minute fibres or scales, by no means hairy or shaggy. Every other part agrees with Micheli's account. The undivided gills are white, soon assuming a rosy flesh-colour from the seminal powder. Head never becoming quite flat; the border neither furrowed nor striated.

4. *A. virgata*. Striped Egg-Agaric. Perf. Disp. Meth. 18 and 66. (*Agaricus volvaceus*; Bulliard t. 262. Sowerb. Fung. t. 1. With. v. 4. 286. Relh. Cant. 507. *A. latus*; With. v. 4. 231?)—Aggregate. Head conical-bell-shaped, somewhat hairy, grey streaked with black. Gills reddish-cinnamon-coloured.—This occurs chiefly on the rotten tan of hot-beds, in summer. The stalk is often a foot high, slender in proportion, of a dirty white, bursting from a large pale-olive wrapper. Head about three inches broad, splitting into several unequal portions. Perfoon esteems Schæffer's *Agaricus bombycinus*, t. 98, as perhaps a mere variety of the above, with a yellowish wrapper, and a shaggy-coated head. Dr. Withering distinguishes between the plants of Bulliard and Sowerby. The latter is certainly Relhau's.

5. *A. pusilla*. Small Egg-Agaric. Perf. Obf. Mycol. v. 2. 36. t. 4. f. 4, 5. (*Agaricus volvaceus minor*; Bull. t. 330, not 530.)—Head hemispherical, bossed, pellicid, of a pearly white, somewhat cottony. Gills flesh-coloured. Stalk white, rather longer than the breadth of the head.—Native of gardens and woods in autumn, in a southern exposure. Bulliard. We have not heard of this species in Britain. Its appearance is elegant and delicate. Head an inch, or inch and a half, in diameter. Wrapper turbinate, much divided, permanent.

SECT. 2. Stalk proceeding from a lax wrapper, and furnished at the upper part with a ring.

6. *A. verna*. Vernal Egg-Agaric. Lamarck Dict. v. 1. 113. Perf. n. 6. (*Agaricus bulbosus verus*; Bulliard t. 108. Fungus totus candidus, pileolo ampliore, glutine limacino infecto, pediculo tenuiori cylindrico, annulo strictione cinctio; Mich. Gen. 171? at the suggestion of Lamarck.)—Pure white in every part. Head at length concave, somewhat funnel-shaped. Ring pendulous. Stalk elongated, solid, cylindrical.—Common in woods in France during the spring. Bulliard says many persons have died from eating this fungus by mistake for the white-gilled variety of the Common Mushroom. It may be kept in the mouth for eight or ten minutes, before its acrimony, resembling pepper, becomes perceptible. If the wrapper at the base be attended to, the plant can never be confounded with any eatable Agaric.

7. *A. porphyria*. Purple Egg-Agaric. Albert. and Schwein. Confp. 142. n. 401. t. 11. f. 1.—Head convex, naked, smooth, of a livid purplish-brown. Ring nearly of the same colour. Gills and stalk white.—Not rare in moist, turfy, mossy spots, in fir woods more especially, over which it is scattered in September and October. Habit of *A. viridis*, n. 9, but only half the size. Stalk three or four inches high, too dark-coloured in the figure. Head almost as much in breadth, never found with warts; very rarely and slightly striated at the margin.

8. *A. bulbosa*. White Bulbous Egg-Agaric. Perf. n. 7. P p Albert.

Albert. and Schw. Confp. 143. (*Agaricus bulbosus*; Schæff. Fung. v. 4. 61. t. 241. With. v. 4. 217. *A. ovoides albus*; Bulliard t. 364. *Leucomyces speciosior*; Battar. Arim. 28. t. 6. f. A.)—White in every part. Head convex. Stalk elongated, tapering; bulbous at the base.—Frequent from spring to the end of autumn, in rich soil, in woods, gardens, about hot-beds, &c. Its size is considerable. Bulliard speaks of his plant as having a very agreeable flavour, and therefore we presume it to be one of the eatable *fungi*. In the fourth of France it is known by the name of *Agaric orange blanche*, to distinguish it from the *A. orange vrai*; see n. 11. The bulbous base of the nearly solid stalk is a characteristic mark. The ring is broad, loosely pendulous, permanent. Head almost hemispherical, rarely with a slightly indicated boss. Schæffer's plate is too much coloured. The gills, if not absolutely white, are semi-pellucid, or watery, in their appearance.

9. *A. citrina*. Lemon-coloured Egg-Agaric. Perf. n. 8, not 7. Disp. Meth. 66. Albert. and Schwein. Confp. 143. (*Agaricus citrinus*; Schæff. Fung. v. 4. 11. t. 20.)—Head smooth, convex, lemon-coloured. Stalk and gills white.—This is described as not unfrequent on the continent, in beech or oak woods, where the ground is sandy. Whether it be found in England, we are doubtful. Mr. Sowerby has exhibited in his t. 286, a pale yellow variety of *Agaricus muscarius*, see n. 13, for Schæffer's *citrinus*; but this is not quite conclusive to us. Perfoon cites *Agaricus Mappa*, Willd. Berol. 381. Batch. Elench. 57, as a variety of the present *Amanita*, distinguished by a darker colour of the head, and yellow gills: he speaks also of brownish warts on the head. Willdenow says the gills of his plant are whitish. Albertini and Schweiniz, accurate practical observers, say, "we find the warts upon the head not very rare. The ring, and frequently the stalk, is distinguished by a palish lemon-colour. The whole fungus is sometimes half a foot high, in which case the head is four inches broad, or more." Perfoon notices apparently a still different variety, on rotten trunks of trees, distinguished by its elegant sulphur-colour, flattish head, and acid flavour.

10. *A. viridis*. Green Egg-Agaric. Perf. n. 9, not 8. Disp. Meth. 67. Albert. and Schwein. Confp. 143. (*Agaricus bulbosus*; Bulliard t. 2, and t. 577. *Fungus phaloides annulatus, fordide virens et patulus*; Vaill. Parif. 74. t. 15. f. 5.)—Head convex, dull green, mostly naked. Stalk and gills white.—Found in sandy moist shady woods, from August to October, in France and Germany. The wrapper is inflated, whitish. Head four or five inches broad, convex, not bossed, of a more or less bright green, variegated occasionally with brown, and turning olive-brown in decay, when, according to Bulliard, it exhales an intolerable cadaverous smell, being a very dangerous species, though when young destitute of any bad scent or flavour. The head sometimes retains fragments of the wrapper, in the form of warts or broad patches, but this seems far from being universal or frequent.

11. *A. caesarea*. Imperial Egg-Agaric. Perf. n. 10, not 9. (*A. aurantiaca*; Perf. n. 11, not 10. *Agaricus cæsius*; Scop. Carn. v. 2. 419. Schæff. Fung. v. 4. 64. t. 247. *A. aurantiacus*; Bulliard t. 120. *Fungus planus orbicularis aureus*; Bauh. Pin. 371. Mich. Gen. 186. t. 77. f. 1. *F. ovinus*; Sterbeek Fung. 64. t. 4. f. D, E, F. *Fungorum efulentorum* genus 17; Cluf. Hist. v. 2. 272.)—Head convex, naked, deep orange-coloured; striated at the margin. Gills yellow, convex. Wrapper dilated upwards.—Native of Italy, France, Carniola, Bohemia, &c., but never observed in England. The wrapper is white, with a dilated entire border. Stalk hollow; nearly cylindrical, yellowish-white, or pale yellow, from four to six inches high.

Head from four to six inches wide, almost hemispherical when young, of a rich deep orange, smooth and naked, scarcely ever warty, striated near the edge, turning brownish or purplish in fading, as in Schæffer's figure, where it is drawn somewhat bossed, which we have never seen. The gills are usually of a delicate lemon-colour, as well as the ring. Perfoon rightly suspected his *A. caesarea* and *aurantiaca* not to be distinct species; they do not appear to us to be even varieties, Schæffer's plant being only in a more forward state than Bulliard's. We retain the oldest specific name, which is that of Scopoli. It serves to commemorate an historical fact, that the emperor Claudius was murdered by poison given with this fungus, to which the Romans applied the name of *Boletus*, and which Nero called "the food of the gods," because Claudius had eaten it, who was subsequently, like his sacred compeers, become a god! The Agaric before us is esteemed the most delicious and delicate of all *fungi*. The writer of this has examined and eaten it in Italy, where it is far from rare in summer, though so much in request, as to find a place chiefly at the tables of the great. Clusius tells of his supping some soup, at a distinguished man's table in Hungary, made of this fungus, to have been coloured with saffron. Dr. Withering has confounded Schæffer's plate with *Agaricus xerampelinus* of the same author, v. 4. 49. t. 214. Sowerb. Fung. t. 31. With. v. 4. 214. Hence he was led into the further mistake of supposing, as his *A. xerampelinus*, though eatable, is strong and disagreeable, that *Agaricus deliciosus* was what Claudius feasted upon. The latter is indeed a very favourite food, but destined to the vulgar in France and Italy, being by far more abundant than our *Amanita caesarea*. The oversight committed by Dr. Withering, respecting this famous fungus, and his own, as well as Schæffer's, *Agaricus xerampelinus*, is the more remarkable, as the latter has neither a wrapper nor a ring. Such errors are rare in this excellent writer. Mr. Sowerby has avoided the same mistake, though he has not explained it. We decline citing *Elvela Ciceronis*, Battar. Fung. Arim. 27. t. 4. C, because no ring is there expressed; but we do not doubt the identity of the plant.

SECT. 3. Stalk with an obliterated wrapper at the base, and a ring at the upper part. Warts on the head small, and generally equal. To this section Perfoon gives the name of *Myoperda*, because some of the species are used for killing flies. All of them perhaps are dangerous.

12. *A. muscaria*. Fly Egg-Agaric. Perf. n. 12, not 11. Albert. and Schwein. Confp. 143. (*Agaricus muscarius*; Linn. Sp. Pl. 1640. Hudf. 612. With. v. 4. 184. Schæff. Fung. v. 4. 13. t. 27, 28. Sowerb. Fung. t. 286. *A. pseudo-aurantiacus*; Bulliard t. 122. *Fungus bulbosus, e volva erumpens, pileolo supernâ parte aereo, ad ora striato, infernâ, et annulato pediculo, albis, rufis, rubro; Mich. Gen. 188. t. 78. f. 2. Fungi lethales*; Ger. Em. 1581, fig. on the left, at the bottom.)—Head scarlet, thinning, convex, at length flattish, variously studded with white warts. Gills, ring, and stalk pure white. Wrapper with scarcely any remaining border.—Common in woods in autumn, especially under fir-trees. A large species, conspicuous for the splendid orange-red hue of its fatten-like head, contrasted with the stalk and gills, and with the prominent angular white or cream-coloured warts, scattered, more or less abundantly, over its surface. These warts are formed from the wrapper, torn off close to the base of the stalk, which Bulliard well observed, as a specific mark between this and our last. It is highly important to discriminate them, *A. muscaria* being venomous in a great degree. When dried, it renders milk poisonous to flies and bugs, killing them very expeditiously;

for which purpose it is preserved in some countries all the year round. Bulliard records, that he ate two ounces of this fungus raw, without any harm whatever, though he found it fatal when given to cats or dogs. Perfoon mentions a variety by the name of *A. formosa*, whose warts were loofe and yellowish, the *stalk* likewise being yellowish, very long, and loofely fealy. Allo another, called *A. puella*, which is smaller, mostly naked, or only bordered with the warty substance; this is Schæffer's t. 28. Dr. Withering reduces the two following, perhaps, to the same species; but so many authors have kept them separate, especially Albertini and Schweiniz, that we shall follow Perfoon in the same measure.

13. *A. umbrina*. Brown Warty Egg-Agaric. Perf. n. 13, not 12. Albert. and Schw. Consp. 143. (*Agaricus verrucosus*; Hudf. 613. Curt. Lond. fasc. 5, t. 72. *A. maculatus*; Schæff. Fung. v. 4. 39. t. 90. *Fungus muscas interficiens fuscus, maculis albis*; Buxb. Hallen. 121.)—Head of a footy or tawny brown, flattish, variously ludded with white warts. Gills, ring, and stalk white.—More common than the preceding, but often accompanying it, in dry sandy woods, fields and pastures, especially under beech-trees, through the autumn. Withering, Curtis, and Light-foot consider this as a mere variety of *A. muscaria*, differing in the brown colour of its *head*, often tinged with yellow, or faintly with red. The size of the whole plant is usually somewhat smaller. We have made no particular observations on this subject. Colour in this tribe often affords good specific characters, and we should, moreover, be careful, in all the departments of natural history, not to be led away by any one very peculiar mark, like the warts in the present instance, to consider every thing, that has such a mark, as one species. Even Linnæus often fell into this error. We know not how the question is to be decided respecting these *fungi*, their artificial propagation by seed being attended with so much difficulty. It is sufficient that we here register their names and distinctions, under the correction of any person who may find good reasons for uniting them. The poisonous quality of *A. umbrina*, with respect to flies, is acknowledged in the above synonym of Buxbaum. Curtis however found the base of the stalk to be the favourite food of a nondescript species of *Tipula*, smaller than the *plumosa*, whose *larvæ* soon devour that and every other part of the plant.

14. *A. rubescens*. Blush-coloured Egg-Agaric. Perf. n. 14, not 13. Albert. and Schweiniz. Consp. 144. (*Agaricus pustulatus*; Schæff. Fung. v. 4. 39. t. 91.)—Head convex, opaque, reddish. Warts crowded, white like the gills. Flesh turning red when broken.—Native of beech woods in Germany, in autumn. We know nothing of its occurrence in Britain, for Dr. Withering's fifth variety of the *muscaria* may probably be different from what is before us. Albertini and Schweiniz assert that the *head* and *stalk* invariably turn red, sooner or later, after being broken, and that this is a sure specific test. The *head* seems more convex than that of *A. umbrina*. Its hue, according to the authors just quoted, is occasionally reddish, livid, smoky, or inclining to a liver-colour. *Stalk* two inches high. *Taste* scarcely any. We conceive this to be distinct from both the foregoing, whatever may be the case between them with regard to each other; and its usual appearance is very elegant, owing to the delicate tawny flesh-colour of the *head*, studded with copious white, or pale flesh-coloured, warts. Perfoon has a variety under the name of *circinnata*, for which he cites with doubt *Agaricus myodes*, Schæff. Fung. v. 4. 69. t. 261. The character given by Perfoon is, "Head hemispherical, somewhat umbilicated, reddish. Warts oblong, whitish, circularly disposed. Gills flattish, whitish. Stalk bulbous,

fealy, the colour of the head." He adds that the *stalk* is two inches long, solid, always perforated by worms (or insects) at the base. *Gills* obovate, sometimes decurrent in a tooth-like form. Substance reddish under the cuticle. Taste not unpleasant. It occurs, but rarely, in woods during autumn. Schæffer's figure exhibits a most elegant blush-coloured *fungus*, internally red, when cut, which we can have no hesitation in considering one species with Perfoon's *circinnata* and *rubescens*.

15. *A. virescens*. Greenish Egg-Agaric. Perf. n. 15, not 14.—"Head fleshy, flat, palish-green. Warts thick, whitish, with many angles. Stalk stoutish, white, with shaggy scales."—In woods, but extremely rare. *Stalk* three or four inches long, clothed with soft shaggy scales. *Wrapper* nearly obliterated. Substance of the *head* spongy, from four to six lines in thickness, not unpleasant to the taste.

16. *A. ampla*. Broad Egg-Agaric. Perf. n. 16, not 15.—"Head fleshy, very broad, mouse-coloured; smooth at the margin. Warts thickish, paler. Stalk white, solid, very stout. Gills narrow, rather thick."—Found in fir woods in Germany, but rarely. Perhaps the largest of its genus. *Stalk* four or five inches long, transversely fealy at the summit. *Gills* thick, about three lines only in breadth. *Head* minutely, in some degree, fibrous, and after the warts fall off, cellular. Taste like the Common Mushroom, *Agaricus campestris*. Perfoon.

17. *A. aspera*. Rough-headed Egg-Agaric. Perf. n. 17, not 16. Obs. Mycol. v. 2. 38. ("Agaricus asper; Abbild. der Schwämme, fasc. 3, with a plate." *A. verrucosus*; Bulliard t. 316. *A. myodes*; Bolt. Fung. v. 4. t. 139, excluding both synonyms.)—Head hemispherical, fleshy, compact, dusky red, rough with crowded pointed warts. Gills white, crowded. Stalk rather bulbous.—Not rare in woods, about July, August, or September, growing dispersed. It has been observed in Germany, France, and England. Perfoon says the scent is powerful; Bulliard, on the contrary, describes this species as inodorous, with a salt taste, partaking but little of a mushroom flavour, and he presumes it to be poisonous. This author justly adverts to the affinity of his plant to our *Amanita muscaria*, observing that it is white or reddish under the skin, never, like the *muscaria*, yellow. Perfoon in his excellent *Obs. Mycol.* gives the following account. "Head at first ovate, inclining to cylindrical; when expanded six inches broad, half an inch thick, compact in substance, strong in scent, often streaked with white at the margin, from cracks in the cuticle. Warts small, erect, pointed. Gills, as usual with this genus, thin, unconnected. Stalk from four to six inches high, solid, marked towards the base, with little fealy warts, like rudiments of the wrapper. Ring sometimes almost obliterated, and hanging in fragments to the edge of the head."

The wrapper in all the species of this third section is, indeed, so closely united to the base of the stalk, as to constitute a kind of bulb, but there is a marginal dilatation, less visible in *A. aspera* than any other, which evinces the true nature of the part in question. This species, though generally so very convex, even hemispherical, appears by Bulliard's plate, to assume a concave cup-shaped form in advancing towards decay.

AMARANTHI, the 30th natural order in Jussieu's system, being the first of his seventh class. See NYCTAGINÆ for the characters of this class. The following are the characters of the *Amaranthi*.

Calyx divided, more or less deeply, often surrounded by scales at the base. *Stamens* definite, sometimes distinct, sometimes monadelphous; in some genera there are scales alternate with the filaments; in others the combined fila-

ments form a tube or sheath. *Germen* simple; style or stigma simple, or double, or triple. *Capsule* of one cell, with an unconnected receptacle, and either bursting at the summit, or splitting all round, containing one or many seeds. The *coraculum* is curved round a farinaceous mass. *Flowers* capitate or spiked. *Leaves* generally undivided and pointed; in some alternate; in others opposite; in a few instances accompanied by *stipulas*. *Stem* for the most part herbaceous. *Stamens* and *pistils* sometimes in separate flowers.

SECT. 1. *Leaves alternate, without stipulas.*

Under this section Jusſieu enumerates *Amaranthus* and *Cloſofa* of Linnæus; with *Arcua* of Forſkall, a genus formed of alternate-leaved ſpecies of *Illecebrum*; and *Digera* of the ſame author, to which *Achyranthes muricata* of Linnæus is ſuppoſed to belong.

SECT. 2. *Leaves oppoſite, without ſtipulas.*

Conſiſts of *Irgſine*, *Achyranthes*, *Gomphrena*, and *Illecebrum*.

SECT. 3. *Leaves oppoſite, with ſtipulas.*

Under this ſection are ranged *Paronychia* of Tournefort, ſeparated from the Linnæan *Illecebrum*; and *Herniaria* of all authors.

This order, as Juſſieu candidly obſerves, is very nearly related to that of the *Caryophylleæ*, which, on account of its having petals, he is obliged to place in a far diſtant part of his ſyſtem. He remarks, on this ſubject, that the abſence or preſence of a *corolla* does not always afford an eſſential, or eminently natural, diſtinction; which is very true, but there is no character of natural orders without ſome exception, and hence Linnæus was led to deny the poſſibility of defining really natural orders by words, or any eſſential characters.

Juſſieu, in the *Annales du Muſeum*, v. 2. 131, has publiſhed ſome additions to the preſent order, which, according to a recent alteration, and perhaps an improvement, in the nomenclature of natural orders, he there terms *Amaranthaceæ*. A tranſlation of his paper may be ſeen in Sims and König's *Ann. of Bot.* v. 2. 274. The author here makes but two ſections of the order in queſtion, one having naked, the other ſtipulated, leaves. To the firſt he adds a new genus by the barbarous name of *Pupalia*, founded on the Linnæan *Achyranthes lappacea*, called in Rheede's *Hortus Malabaricus*, v. 7. t. 43, *Pupal-Valli*. Of this we are ſurpriſed to find Juſſieu had never ſeen the fruit, and we cannot but obſerve that its generic characters are rather weak, being chiefly taken from the inſloreſcence and bractæes.

To the ſection with ſtipulated leaves, this eminent botaniſt adds three new genera. 1. *Anychia* of Michaux, to which belongs *Queria canadensis* of Linnæus. 2. *LITHOPHILA* of Swartz. 3. *POLYCHROA* of Loureiro. The two laſt are already deſcribed in their proper places. See alſo *QUERIA*.

Juſſieu proceeds to remark, that *Cyatula* of Loureiro, a plant of this order, is really an *Achyranthes* with a many-cleft ſtigma; but that *POLIA* of the ſame author, (ſee that article and *HAGÆA*), ſuppoſed to belong to the *Amaranthi*, is really one of the *Caryophylleæ*.

VOL. II.

AMBOISE, AMBASIA, or *Ambacia*, in *Geography*, a town of France, in the department of the Indre and Loire, and chief place of a canton in the diſtrict of Tours, ſituate at the conflux of the Loire and Amaffe. The place contains 5100, and the canton 14,415 inhabitants; the territory comprehends 322½ kilometers, and 16 communes.

AMDOA, in *Geography*. See THIBET.

AMEDNAGUR, l. 1, Soubah, now called Dowlatabad. Add—This city has generally been placed 50 miles to the S.E. of its true poſition.

AMELIA, l. 5, for including *r.* excluſive of; l. 6, *r.* 10,594 and 7186. Add—Nottaway contains 9278 inhabitants, of whom 6368 are ſlaves.

AMENTACEÆ, in *Botany*, of which term mention has already been made in its place, as designating a Linnæan natural order, is alſo the appellation of the 99th order in Juſſieu's ſyſtem, the fourth of his fifteenth claſs; correſponding for the moſt part, though not entirely, with that of Linnæus, and ſo called from *Amentum*, a Catkin, in alluſion to the nature of its fructification. See EUPHORBIÆ for the characters of this fifteenth claſs of Juſſieu, and remarks thereon. He thus defines his *Amentaceæ*.

Flowers monoecious or dioecious, (rarely with ſtamens and piſtils in the ſame,) all deſtitute of petals. The male, or barren, flowers diſpoſed in a catkin, conſiſting either of ſcales, into which the ſtamens are inſerted, or each of thoſe ſcales has a *calyx* attached to it, which bears the *ſtamens*. The latter are either definite, or indefinite, with diſtinct filaments. (We would here obſerve that two or three ſpecies of *Salix* are remarkable for their combined, or monadelphous, filaments.)—The female, or fertile, flowers are either amentaceous, or faciculated, or ſolitary; ſometimes furniſhed with a ſingle-leaved *calyx*, ſometimes with only a ſcale. The *germen* is ſuperior, either ſimple, or in ſome rare inſtances more than one, of a certain determinate number. *Style* one or more. *Stigmas* generally feveral. *Seeds* either naked, or enclosed in ſuperior *capſules*, which are either of a coriaceous or bony texture, as many in number as the germens, and for the moſt part of a ſingle cell. *Coraculum* deſtitute of *albumen*, with a ſtraight radicle. *Stem* arboreous, or ſhrubby, rarely of humble growth. *Leaves* alternate, accompanied by *ſtipulas*, moſtly ſimple.

SECT. 1. *Flowers with ſtamens and piſtils.*

Here Juſſieu ranges *Fothergilla*, *Ulmus*, and *Celtis*; of which the two latter are placed by Linnæus among his *Scabridæ*. *Hamamelis*, which the laſt-named author has, in manuſcript, referred to his *Amentaceæ*, and which is ſurely next akin to *Fothergilla*, is reckoned by Juſſieu among his *Berberidæ*, or at leaſt among ſeveral genera ſuppoſed related to that rather miſcellaneous order.

SECT. 2. *Flowers dioecious.*

This contains *Salix*, *Populus*, and *Myrica*.

SECT. 3. *Flowers monoecious.*

A larger aſſemblage of genera, if not of ſpecies, conſiſting of *Betula*, *Carpinus*, *Fagus*, *Quercus*, *Corylus*, *Liquidambar*, (under which laſt the genus now called *COMPTRONIA*, ſee that article, is hinted at,) and *Platanus*. There is no appendix of doubtful genera, as in moſt other orders of Juſſieu, but a ſuſpicion is expreſſed reſpecting *Liquidambar* and *Platanus*.

The *Amentaceæ* of Linnæus are, *Salix*, *Populus*, *Platanus*, *Sloanea*, with a juſt indication of doubt, *Fagus*, *Juglans*, *Quercus*, *Corylus*, *Carpinus*, *Betula*, *Myrica*, *Piſtacia*, and *Cynomorium*. *Brabejum* is, in the Linnæan manuſcript, inſerted immediately before *Fagus*; *Hamamelis* before *Betula*, after which *Brabejum* is again written; an evident indication of great uncertainty in the mind of the writer, who knew this genus but imperfectly, and who had conceived no idea at all of the order *Protaceæ*, to which it clearly belongs, and which makes for ſtriking a figure in the works of Juſſieu; and eſpecially of our countryman Mr. Brown. See *Prodr. Nov. Holl.* v. 1. 363, and *Tr. of Linn. Soc.* v. 10.

AMERCOTE, in *Geography*, a fortified place, which formerly belonged to the country of Scind, but is now in the poſſeſſion of the rajah of Joudpore. Situated S.E. of Hydrabad, and about 25 miles from the eaſtern branch of the Indus.

AMERICA, NORTH. See UNITED STATES.

AMES, a township of Ohio, in the county of Athens, having 608 inhabitants.

AMESBURY, a town of the Massachusetts, in Essex county, having 1890 inhabitants.

AMHERST, l. 3, r. 10,548; l. 4, r. 5207.

AMHERST, l. 6 from the bottom, r. 1554. Add—Alfo, a town of Massachusetts, in the county of Hampshire, having 1469 inhabitants.

AMIA, in *Ichthyology*, a genus of the abdominal fishes, the characters of which are, that the head is bony, naked, rough, with conspicuous fures; teeth, both in the jaws and palate, close-set and sharp; the two cirri near the nostrils; the gill-membrane twelve-rayed; and body scaly. There is one species, *viz.*

CALVA; the Carolinian Amia, with a black spot at the base of the tail. This is a small fresh-water fish, inhabiting some parts of Carolina. Described by Linnæus, from a specimen sent from Carolina by Dr. Garden.

AMITY, in *Geography*, a township of Pennsylvania, in the county of Berks, containing 1090 inhabitants.

AMMODYTES, in *Ichthyology*. Add—The ammodytes tobianus is the lance with the lower jaw longer than the upper. It conceals itself about a foot in the sand, with its body rolled into a spiral form; it is dug or drawn up, and used by the fishermen as a bait; it is also considered as a delicate article of food. The general length is from eight to ten inches. The lance lives on worms, water-insects, and small fishes, and even occasionally on those of its own species. It is itself preyed upon by the larger fishes, and particularly by the mackerel. It spawns in the month of May, depositing its eggs in the mud near the edges of the coast. The swimming bladder is wanting, so that the animal is fitted only for a littoral residence; and its scales are so small that they have been wholly overlooked, and their existence disputed by some ichthyologists. Shaw.

AMMONIA, in *Chemistry*. The following additions to our knowledge, respecting the volatile alkali, have been made since that subject was treated in the Cyclopædia. Water, as has been already stated, by absorbing ammoniacal gas increases in bulk, and becomes specifically lighter. The following table by Mr. Dalton exhibits the quantity of ammonia contained in ammoniacal solutions of different specific gravities.

Specific Gravity of Liquid.	Grs. of Ammonia in 100 Water-grain Measures of Liquid.	Grs. of Ammonia in 100 grs. of Liquid.	Boiling Point of the Liquid.	Volumes of Gas condensed in a given Volume of Liquid.
.65	30	35.3	26°	494
.86	28	32.6	38	450
.87	26	29.9	50	419
.88	24	27.3	62	382
.89	22	24.7	74	346
.90	20	22.2	86	311
.91	18	19.8	98	277
.92	16	17.4	110	244
.93	14	15.1	122	211
.94	12	12.8	134	180
.95	10	10.5	146	147
.96	8	8.3	158	116
.97	6	6.2	173	87
.98	4	4.1	187	57
.99	2	2.0	196	28

When potassium or sodium is heated in ammoniacal gas, the metal becomes changed to an olive-green colour, and loses its metallic lustre; at the same time a portion of the gas is absorbed, and a quantity of hydrogen emitted, exactly equal to the quantity that would be evolved if the potassium or sodium were put into water. If the olive-green matter be heated, it gives out three-fifths of the ammonia absorbed, two-fifths in the state of ammoniacal gas, and one-fifth in the state of hydrogen gas and azote. Sir Humphrey Davy, having heated the olive-coloured matter strongly in a platinum tube, obtained nearly the whole of the ammonia absorbed, though about three-fifths of it were in the state of azotic and hydrogen gas. If the olive-coloured matter be placed in contact with a very little water, it is converted into potash, or soda and ammoniacal gas, and the gas is just equal to what the metal had absorbed. If it be placed in contact with a metal and heated, an alloy of the metal with potassium or sodium is obtained.

For these curious facts we are indebted to Gay Lussac and Thenard, and Davy. Dr. Thomson thinks they shew that potassium and sodium have the property of decomposing ammonia, and combining with its azote, while the hydrogen of the ammonia is set at liberty; and the *azoturet* formed, he thinks, combines with a portion of the remaining undecomposed ammonia. He acknowledges, however, that there are some objections to this opinion; and the facts accord better with the opinion, that an unknown compound of azote and hydrogen unite with the alkaline metal, while the compound thus formed combines with a portion of undecomposed ammonia.

A curious experiment made by Berzelius and Pontin induced Berzelius to draw the conclusion that ammonia is composed of an unknown metallic basis, which he has called *ammonium*, united to oxygen. This experiment has been since confirmed by sir H. Davy, Gay Lussac, and others, and is as follows:

When mercury is brought in contact with ammonia at the negative end of a galvanic battery, it gradually increases in volume, and is converted into a soft solid, having all the appearances of an amalgam. The experiment succeeds better if sal ammoniac slightly moistened be substituted for liquid ammonia. This amalgam, at the temperature of 70° or 80°, is a soft solid, of the consistence of butter; at 32° it is a firm crystallized mass, having a specific gravity below 3. When exposed to the air, it soon becomes covered with a crust of carbonate of ammonia. When thrown into water, hydrogen is evolved equal to half its bulk, the mercury is revived, and the water becomes a weak solution of ammonia. When confined in a given portion of air, the air increases in bulk, and pure mercury appears. Ammoniacal gas, amounting to $1\frac{1}{2}$ or $1\frac{2}{3}$ the volume of the amalgam, is evolved; and a quantity of oxygen equal to $\frac{1}{3}$ th or $\frac{1}{4}$ th of the ammonia disappears. When thrown into muriatic acid gas, it becomes coated with muriate of ammonia, and a little hydrogen is disengaged. In sulphuric acid it becomes coated with sulphate of ammonia and sulphur. All attempts to preserve this amalgam failed, from the impossibility of obtaining it free from water. When put into a glass tube, or when confined under naphtha or oils, the mercury separated, ammonia was formed, and a quantity of hydrogen evolved.

Gay Lussac and Thenard considered this amalgam as a simple compound of mercury and ammonia; but no analogous compound is known to chemists, as mercury when it unites to other substances, except metals, always loses its metallic lustre. These reasons induced Berzelius to form the above opinion. Most chemists at present agree with Gay Lussac and Thenard; but if their opinion be well founded, we must alter the notions entertained respecting amalgams.

The opinion at present entertained respecting the composition of ammonia is, that it is composed of three volumes of hydrogen and one volume of azote condensed into two volumes. Hence its specific gravity compared with that of common air is .590; 100 cubic inches at a mean temperature and pressure weigh 18 grains, and the weight of its atom is 21.25; that of oxygen being considered as 10.

AMMONIA, Salts of. These have been omitted in the usual place, namely, under AMMONIA; but most of them will be found in a subsequent part of the work, under SALTS. Those described elsewhere will be referred to here, and those remaining to be described will be now noticed.

Sulphite of Ammonia. See SULPHITE of Ammonia.

Chromate of Ammonia. This salt may be formed by saturating chromic acid by ammonia. It usually exists in the form of dendritical crystals of a fine yellow colour. When slightly heated, it is decomposed, even when in solution, brown flocks of chromic oxyd precipitating.

Arseniate of Ammonia. See ARSENATE of Ammonia.

Molybdate of Ammonia. This salt dissolves readily in water. The solution does not crystallize. When heated, the ammonia is partly driven off, partly decomposed, and the acid is reduced to the state of an oxyd.

Tungstate of Ammonia. This salt may be formed by dissolving tungstic acid in carbonate of ammonia. It is soluble in water, and crystallizes. Its taste is metallic, and it is entirely decomposed by heat.

Benzoate of Ammonia. This salt crystallizes with difficulty. It deliquesces, and is very soluble in water. It has been recommended by Berzelius as an excellent re-agent for precipitating iron from its solution. It throws down this metal of an orange colour, and occasions no insoluble precipitates with any of the other bases, except tellurium and mercury, and perhaps copper, all of which are thrown down white.

Succinate of Ammonia. See SUCCINIC Acid. This salt has also been much recommended for precipitating iron when in the state of peroxyd.

Camphorate of Ammonia. This salt may be prepared by dissolving carbonate of ammonia in hot water, and adding camphoric acid slowly till the alkali is saturated. It crystallizes with difficulty; is sparingly soluble in cold water, but much more soluble in hot. It is completely soluble in alcohol. Most of the calcareous salts form triple compounds with this salt.

Citrate of Ammonia. See CITRATE of Ammonia. The remaining salts of ammonia are so totally devoid of interest, or so little known, that we do not think it necessary to enumerate them.

AMMYRSINE, in Botany, a new genus of Mr. Pursh's, more happily circumstanced in its characters, perhaps, than in its name. The latter is formed from *αμυρς*, sand, and *μυρτιν*, a dwarf myrtle; but *Myrsine*, being an established generic name, cannot, with propriety, make a part of another. Linnæan law, (see *Phil. Bot. sect.* 225,) and good sense, are both against it; and if some similar innovations have, from peculiar causes, crept in, they are not to be imitated, though for the present they may be tolerated. The genus in question is founded on *Ledum buxifolium*, (see LEDUM, n. 3,) and stands in the Class and Order *Pentandria Monogynia*, in Mr. Pursh's *Flora* 280 and 301, agreeing, of course, in Natural Order with *Ledum*. The following are its characters.

Calyx in five deep segments. Petals five. Stamens prominent. Capsule of five cells, bursting at the summit.

Ledum is characterized.

Calyx minute, five-toothed. Corolla flat, in five deep segments. Capsule of five cells, bursting at the base.

AMNIOS, Liguor of the, Chemical Properties of. The peculiar acid principle termed by Vauquelin and Buniva *amniotic acid*, does not appear to exist during all the periods of gestation in the liquor amnii of the cow. Dr. Prout examined this fluid taken from an animal which had been slaughtered in an early period of her gestation, but was not able to detect any of the acid in question. See *Annals of Philology*, vol. v. p. 416.

AMOMUM, in Botany, *αμμοιον* of the Greeks, most probably derived from its Arabic denomination *bhamâmâ*, as De Theis writes it, is the ancient name of a sort of aromatic grain, or fruit, included, according to all appearance, among the species of the present AMOMUM of botanists. (See our former article, where this genus comprehends a much more extensive range of species than are now understood to belong to it.) Linnæus, and his immediate followers, included under *Amomum* almost every plant of the *Scitamineæ* that they knew not how otherwise to dispose of; and Gertner, though he altered the name for the worse, to ZINGIBER, (see that article,) threw no new light upon the characters or history of the genus, but rather, like every body else, added to their confusion. Mr. Roscoe first defined this genus, like the rest of the SCITAMINEÆ, as the reader will find under that head, by a clear distinctive character; and while he greatly reduced the number of species, rendered the whole perfectly clear and intelligible. We shall, as we have done with ALPINA, give a full view of this genus, as at present understood, and while we make considerable retractions, shall have something new to add in their place.—Roscoe *Tr. of Linn. Soc.* v. 8. 351. t. 20. f. 11. *Dryandr.* in *Ait. Hort. Kew.* v. 1. 8. Linn. *Gen.* 2. Schreb. 3. *Willd. Sp. Pl.* v. 1. 6. Mart. *Mill. Dict.* v. 1. Carey *Hort. Bengal.* 1. Roxb. *Monard.* 23. *Juff.* 67. Lamarck *Illustr.* t. 2. f. 1. (Zingiber; Gertner, t. 12. f. 1, 2, 3, 6.)—Class and order, *Monandria Monogynia*. Nat. Ord. *Scitamineæ*, Linn. *Canna*, Juff.

Gen. Ch. Cal. Perianth superior, of one leaf, tubular, sheathing, membranous, coloured, splitting at one side about half way down. *Cor.* of one petal; tube shorter than the calyx, cylindrical, erect; outer limb in three nearly equal, oblong-lanceolate, concave, erect segments much longer than the calyx; inner of one large, undulated lip, with a short concave claw. *Stam.* Filament one, rather longer than the claw, stout, oblong, depressed, somewhat incurved, with a lanceolate, acute, ascending lobe, about half its own length on each side, at the base, and a pair of similar, erect or transverse, lobes, forming a crest at the summit, with either an intermediate prominence, or a notch; anther of two distinct, elliptic-oblong, lobes, attached by the back, below the summit. *Pist.* Germen inferior, small, roundish, somewhat furrowed; style thread-shaped, lying close to the filament, between the lobes of the anther; stigma funnel-shaped, fringed, erect, projecting a little beyond the filament. *Peric.* Capsule either ovate-oblong, or nearly globular, of three cells, and three coriaceous, somewhat striated, valves; the partitions membranous. *Seeds* numerous, oblong, roundish, or slightly angular, each enveloped in a soft pulpy tunic, which becomes membranous, or evanescent, when dry.

Ess. Ch. Anther of two distinct lobes. Filament with a lobed crest, above the anther. Outer limb of the corolla in three oblong lobes; inner a single lip. Capsule of three cells and three valves. *Seeds* tunicled.

One of the most natural genera that can exist, in any natural order, and the best defined in habit, as well as character.

AMOMUM.

character. The *root* is perennial, tuberous, jointed, and somewhat creeping, with strong and deep fibres. *Stems* at least biennial, erect, simple, invested with the sheaths of the two-ranked, simple, elliptic-oblong, striated, vertical *leaves*. *Spikes* invariably radical, simple, rather lax, stalked, their stalks scaly. *Bractæes* large, concave, coriaceous, more or less closely imbricated, single-flowered. *Flowers* large and handsome, white or reddish, remarkable for the broad, rounded, undulated, generally crenate *lip*, often yellowish at the base. *Capsules* large, with very numerous, in general powerfully aromatic, or very pungent, *seeds*. Every part of the plant is commonly aromatic. We have improved our knowledge of the *fruit*, and the nature of the *tunic* of the *seeds*, from Dr. Roxburgh's observations in India. Gertner speaks of the *capsule* as not burbling, because he had chiefly examined specimens gathered before they were ripe, like all the Cardamoms of the druggists' shops, some of which belong to the genus before us. The same able author has also mistaken the top for the bottom, in his figure called *A. sylvæstre*.

We know not how it has happened that only one species of *Amomum* appears in *Hort. Kew.* *A. Afzeli*; with another, *A. grandiflorum*, (published long before) in the *Addenda* to that work. *A. Granum-Paradisii*, raised from seeds brought from Sierra Leone by Dr. Afzelius, has long been cultivated in England, though we have never heard of its flowering; and there are several more in the same predicament. They are stove plants, requiring a considerable degree of heat. No collection perhaps is so rich in this genus, or in the whole natural order, as that of the Botanic Garden at Liverpool, where the plants have every advantage of skill of cultivation, and where nothing that may occur, relative to their growth or history, can escape the eye of that illustrious writer and botanist, who first reduced them to order.

All the known species appear to be natives either of equinoctial Africa, Madagascar, or the East Indies; nor have we any from America, or the West Indies.

1. *A. Cardamomum*. Cluiter Cardamom, or True Amomum. Linn. Sp. Pl. 2. Willd. n. 7. Loureir. Cochinch. 3. Retz. Obf. fasc. 3. 59. Rofc. n. 1. Roxb. n. 1. (A. n. 2; Linn. Mat. Med. 1. A. verum; Ger. Em. 1548. f. 6. Amomum; Dale Pharmac. 277. Barrel. Ic. t. 571. f. 1. Amomo legitimo degli antichi; Pona Baldo, 50. Cardamomum minus; Rumph. Amboin. v. 5. 152. t. 65. f. 1. Bont. Hist. Nat. 126, with a figure (the oblong capsule excepted, which belongs to Cardamomum medium of the shops). Zingiber minus; Gært. t. 12. f. 6.)—Leaves lanceolate. Spikes lax, many-flowered. Bractæes lanceolate, acute. Lip three-lobed. Crest of three, nearly equal, erect lobes. Capsule globular.—Native of the Malay islands, where the inhabitants use the seeds as a substitute for the Malabar, or Lesser, Cardamom. Dr. Charles Campbell sent plants from Sumatra to the Calcutta garden, where they blossom in May, just before the rains begin. Roxburgh. Rumphius speaks of this species as cultivated plentifully, but not wild, in Amboyna and the neighbouring islands. It is certainly the true original *Amomum* of the shops, still to be met with at Venice and in other parts of the south of Europe, though generally supplanted by the more valuable Lesser Cardamom, *Amomum repens* of Sonnerat, which Linnæus confounded herewith, and of which we propose to treat by the name of *ELETTARIA* hereafter. Nothing is more rare, with collectors of the *Materia Medica*, than the capsules of this *A. verum* in their native clusters or spikes. We were fortunate enough, after ransacking the druggists' shops at Marseilles and Venice, to

meet with two or three such specimens, accompanied by *bractæes*, very important as determining the identity of this plant with the Linnæan specimens of *A. Cardamomum*. By macerating the *flowers* of these last, we have also ascertained their structure, which agrees with Dr. Roxburgh's account, the summit, or crest, of the *filament* being three-lobed. The lateral lobes are short and erect, not much elevated above the central one; neither are they transverse, awl-shaped, and elongated, as in *A. Afzeli*, *grandiflorum*, and some others. The two lobes of the *anther* stand near the edges of the *filament*, remote from each other, but meet round the *style*. Dr. Roxburgh speaks of the *flower-spikes* as even with the earth. But however this may be, they are elevated above the *root*, each on a simple wavy *stalk*, two inches long, clothed with sheathing, elliptical, ribbed, abrupt, barren scales. The *spike* is an inch or an inch and a half long, sometimes two inches when in seed, with many pale, smooth, imbricated, elliptic-lanceolate *bractæes*, near an inch in length, one to each *flower*. The *germen*, *calyx*, and *common receptacles*, are hairy, or rather brittle. *Capsules* sessile, the size of a black currant, globular, somewhat depressed, obscurely three-lobed, striated, crowned with a blunt protuberant scar. *Seeds* roundish, angular, dotted, brown, aromatic and pungent, resembling in flavour the *Elettaria*, but less powerful, and rather less agreeable. The *leaves* of this species are rather narrower than in others of the genus, except perhaps the following; but our leading distinctions throughout must be taken from the *bractæes*, *flowers*, and *fruit*.

2. *A. angulifolium*. Greatest Cardamom, or Madagascar Amomum. Sonnerat Ind. Or. v. 2. 242. t. 137. Willd. n. 6. Rofc. n. 2. Roxb. n. 2. (A. madagascariense; Lamarck Dict. v. 1. 133. Cardamomum majus; Matth. Valgr. 25, but not Dale Pharmac. 276.) Camer. Epit. 11. f. 1. Barrel. Ic. obf. 1394. t. 971, the largest fruit. Grana Paradisi; Ger. Em. 1542, the figure, as being copied from Matthioli, but not the description. (See also Bauh. Hist. v. 2. 204, and Lob. Ic. v. 2. 204, where the same error is committed, as well as in Chabr. Stirp. 128.)—Leaves lanceolate. Spikes capitate. Bractæes ovate. Lip obovate, undivided. Lateral lobes of the crest tapering, horizontal. Capsule ovate, pointed, striated. Seeds globular, abrupt at the base.—Native of marshy ground in Madagascar, where it was first ascertained and figured by Sonnerat. It is cultivated at the Mauritius, and from thence was carried by captain Tennent to the Calcutta garden, where it blossomed during the cool season. Dr. Roxburgh says, "the *flowers* possess a considerable share of spicy fragrance, and are showy, the upper *bractæes*, and exterior border of the *corolla*, being red, and the large lip yellow." This writer terms the *leaves* broad-lanceolate; which does not answer to Sonnerat's figure, name, or description, but perhaps this circumstance is variable. The *flower-stalks* rise above the ground, and are seven or eight inches high, clothed with tubular scales. *Flowers* in a short crowded *spike*, with a concave *bractæa* to each, near an inch and a half long. The *capsule* and *seeds* we have already described, (see *MELLEGETTA*;) where some other species are mentioned, which we shall here attempt to arrange systematically, but need not repeat the minute remarks there given.

3. *A. macrospermum*. Large-seeded Guinea Amomum. (Zingiber Melegueta; Gært. t. 12.)—Spikes capitate. Bractæes ovate, as long as the fruit. Capsule ovate, pointed, somewhat striated. Seeds obovate, with a prominent, bordered, crenate scar.—Native of Sierra Leone, in the burying-ground of the settlement, from whence seeds were brought us by professor Afzelius; but having

uluckily

unluckily not observed the plant or its *flowers*, nor gathered more than one *capsule*, he was unable to give us any further information than what these *seeds* afford. Their flavour is very slightly aromatic. Their lead-coloured hue is well noticed by Gærtner, though his figure represents them scarcely half large enough. The *bractæes* appear twice the size of the last, to which unquestionably this species is next akin. This is *Amomum*, n. 1. of professor Afzelius's MSS. The natives call it *Mabooboo*.

4. *A. Clusii*. Long-seeded *Amomum*. (Fructus 14; Clus. Exot. 37, 38, with a figure. Grænis Paradyfi, five Mellegetta affinis fructus; Bauh. Pin. 413.)—Spikes capitate. Bractæes ovate, much shorter than the fruit. Capsule ovate, pointed, striated. Seeds cylindrical, highly polished, with a bordered, crenate scar.—The native country of this species is unknown, Clusius's specimen having been collected by an apothecary, who died in the course of his voyage, and left no memorandum respecting this point. (See MELLEGETTA for a description of a specimen, which we accidentally met with in a druggist's shop, in a chest of Great Cardamoms, *A. angustifolium*, if we mistake not, and which therefore probably came from Madagascar.) The cylindrical, dark-brown, highly polished *seeds*, appearing as if varnished, clearly distinguish it from both the two last. The short *bractæes* in Clusius's figure, unless the upper ones had been stripped off, afford a no less striking distinction. The *seeds* had only a slight pungency from the first. Those of our Great, as well as Clusier, Cardamoms, are as high flavoured as ever, though at least twenty-five years old.

5. *A. Grana-Paradyfi*. Grains of Paradise *Amomum*, or Mellegetta Pepper.—Spikes capitate. Bractæes ovate, rather shorter than the fruit; lower ones crowded. Capsule oblong, bluntly triangular, minutely hispid. Seeds ovate. Stipula entire, fringed. (See MELLEGETTA for the history and synonyms of this species.) The brown *seeds*, distinguished by a peculiar and very hot flavour, are very different from the following, and the *bractæes* have a short, thick, dorsal spine.

6. *A. grandiflorum*. Large-flowered Cardamom. Sm. Exot. Bot. v. 2. 103. t. 111. Ait. Epit. 363.—Spikes capitate. Bractæes elliptical, shorter than the fruit; lower ones distant. Capsule oblong, bluntly triangular, minutely hispid. Seeds ovate. Intermediate lobe of the filament entire. Stipula cloven, smooth.—Native of Sierra Leone. Seeds, brought by professor Afzelius, have produced flowering plants in England. The root is perennial, woody, creeping. Leafy stems about three feet high, erect, round, smooth, very slender. Leaves several, elliptic-lanceolate, long-pointed, recurved, often tinged with red, very smooth: the long, narrow, polished *sheaths* each crowned with a somewhat cloven, rounded *stipula*, whose edges are quite smooth, not fringed with bristly hairs, as in *A. Grana-Paradyfi*. *Flowers*-stalks erect, two inches high, striated, downy. Lower *bractæes* elliptical, concave, spreading, and so far distant that the stalk is usually visible between them; upper much larger, though of a smaller proportion than those of our second or third species, and not above half so long as the *flower* or *fruit*, membranous, finely ribbed, scarcely spinous, somewhat coloured, permanent. *Flowers* in a short, dense, capitate cluster, large and handsome, whether fragrant or not we have no information, but when dried, and moistened again, they are highly aromatic. *Galyx* rose-coloured, above an inch long, with a blunt spreading point. Outer limb of the *corolla* of the same hue, twice as long; *lip* of a broad rounded kidney-shape, waved, plaited, crenate, slightly notched, but not divided, nor

deeply lobed, near two inches broad, white, with a yellow spot at the base. *Stamen* white, not half so long as the *lip*, furnished at the bottom with two awl-shaped divaricated lobes, and at the top with two nearly horizontal ones, of the same size and figure, having between them a central, short, rounded, quite entire lobe. The *capsule* is very like that of *Grana-Paradyfi*, in size, shape, and pubescence. The *seeds* are also similar in size and shape to that species, but differ in being grey or lead-coloured, much less polished, and in having a totally different flavour resembling camphor, which they equal in warmth and pungency. As a stimulant, or cordial, these *seeds* appear equal to any Cardamom whatever. When the *flowers* of *Grana-Paradyfi* become known, which is now one of our greatest botanical desiderata, there probably will be more distinctive characters discovered between that species and the present.

7. *A. Afzelii*. Sweet-scented *Amomum*. Rofc. n. 8. Ait. n. 1. (*A. excapum*; Sims in Ann. of Bot. v. 1. 548. t. 13.)—Spikes capitate, of few flowers. Bractæes shorter than the fruit. Capsule oblong, triangular. Stipula smooth? Intermediate lobe of the filament cloven.—For this also we are indebted to Dr. Afzelius, who brought the seeds from Sierra Leone. From them Mr. Loddiges at Hackney raised plants, which flowered in his stove in June 1804, and were described by Dr. Sims. The original name, *excapum*, not being exactly correct, has been changed for one to which no lover of science or of personal worth can object. The leaves are as broad as the last, nor does the herbage of these plants in general afford many distinctive marks. We presume, from the figure, that the *stipulas* are smooth. The *flower*-stalk, though not wanting, is much shorter than any of the former, and there seem to be no more than two external *bractæes*, besides some membranous ones close to the flowers, apparently less firm and durable than usual. The outer limb of the *corolla* is pale flesh-coloured. *Lip* rather more oblong, and plaited lower down, than in the last, crenate at the edges, white, with a yellow central spot. *Stamen* essentially different from *A. grandiflorum*, in having its middle lobe in two deep acute segments. What we have for the *capsule* of this species is ovate, pointed, triangular, nearly or quite smooth, rather larger than either of the two last. Seeds obovate, dark brown, highly polished, with a prominent-bordered scar, as in *A. macrospermum* and *Clusii*, totally unlike the two foregoing. These *seeds* have scarcely any flavour, and are not at all aromatic. The *flowers* are fragrant only when dried, as in *grandiflorum*.

8. *A. srobilaceum*. Cone-bearing *Amomum*.—Spikes capitate. Outer bractæes numerous, elliptical, gradually larger upwards; floral ones scarcely longer, membranous, striated, rough at the extremity. Stipula abrupt, nearly smooth.—Native of Sierra Leone, from whence we were favoured with a specimen by Dr. Afzelius. This has very slender leafy stems. The leaves are elliptic-ovate, pointed, very smooth. Stipula rounded, scarcely cloven, very slightly, if at all, fringed. *Flower*-stalks several inches high, smooth, covered with numerous, imbricated, elliptical, very broad, concave, sheathing *bractæes*, gradually larger upwards, with broad dorsal points; the lowermost not quite an inch long, the upper two inches; all finely striated, very smooth to the touch, of a bright chestnut colour when dry. Within the two uppermost are the proper *bractæes*, accompanying the head of *flowers*, much narrower, hardly at all longer, flatter, more membranous, hairy in the upper part, abrupt with a small point. Of the *flowers* we know nothing, nor are we certain of the *fruit*. The only unappropriated *capsules* of any *Amomum*, communicated from Sierra Leone

by Francis Borone, (see the article *RUTACEÆ*), are those of *A. n. 2.* of Afzelius, called by the natives *Massaba*, which are very likely to belong to the present plant, though we have no proof of it. These agree with the outer *bracteas* in colour and smoothness, and are ovate-oblong, only half the size of the last, with which their *seeds* very precisely accord, both in appearance and in want of flavour. Indeed they are so alike, and such a coincidence between the *seeds* of different species of *Amomum* is so unusual, that we could almost presume the *capsule* above described for *A. Afzelii*, might be a very large one of this *n. 2.* We do not however form any such conclusion, the seeds of *A. Clusii*, undoubtedly a distinct species from both these, having *seeds* precisely like them, only rather larger.

10. *A. villosum*. Rough-fruited Amomum. Loureir. Cochinch. 4. Willd. n. 8. Rofc. n. 5. (*Globba crispa rubra*; Rumph. Amboin. v. 6. 137. t. 61. f. 2.)—Spike ovate, stalked. *Bracteas* linear-lanceolate, elongated. *Capsule* globular, obscurely triangular, rough with scattered bristles.—Native of Java, Amboyna, and the Molucca islands, as well as of Cochinchina, in hilly situations. The *seeds* are exported in great quantities to China, for medical use, being, according to Loureiro, stomachic, warm and strengthening. The *root* is woody and creeping; its fibres aromatic. *Leafy stems* six feet (Rumphius says fourteen to sixteen feet) high, weak, erect, perennial. *Leaves* smooth. *Flower-stalk* four inches long, slender, reclining. *Spike* nearly ovate, with linear, imbricated *bracteas*. *Flowers* pale. *Capsule* nearly globular, half an inch in diameter, rather pulpy and sweet, reddish, clothed with numerous thick protuberances. *Seeds* angular, brown. The whole plant has an aromatic, but not powerful, odour. This description of Loureiro's is not unfitting to the above synonym of Rumphius, to which he refers, except that the latter describes the roughness of the *fruit* as consisting of short feathered spines, or bristles.

11. *A. uliginosum*. Marsh Amomum. Retz. Obf. fasc. 3. 56. Rofc. n. 6.—Cluster stalked. *Bracteas* ovate-oblong. *Capsule* globular, obscurely triangular, shaggy. Intermediate lobe of the filament in two rounded segments.—Found by Kœnig at Raput-Nok, in Tranquebar, in shady wet situations, flowering about the middle of May. *Leafy stems*, a yard or more in height. *Leaves* smooth on both sides, with hairy *stipulas*. *Flower-stalks* somewhat curved, clothed with ovate-oblong, smooth, red scales. *Flowers* white, variegated with red and yellow. *Stamen* crowned with four lobes, the two lateral ones narrowest and smallest, the two middle ones broad and rounded. *Capsule* clothed, before it is dried, with blood-coloured *cirrhii*, or threads. *Kœnig*.

12. *A. echinatum*. Hedge-hog Amomum. Willd. n. 9. Rofc. n. 7. (*Globba crispa viridis*; Rumph. Amboin. v. 6. 137. t. 61. f. 1.)—Spike capitate, nearly sessile. *Bracteas* membranous. *Capsule* globose, all over spinous.—Native of Amboyna, the Molucca islands, &c. Rumphius. *Leafy stems*, according to Rumphius, ten or twelve feet high. *Leaves* twenty inches long, of the breadth of four or five fingers. *Fruit* larger than that of *A. villosum*, always of a deep green, and armed with spines like a Thorn-apple, growing in dense sessile clusters or tufts at the root. We know nothing of this species but from Rumphius, for after much perplexity and consideration, we are decidedly of opinion that *Amomum n. 2.* of Kœnig, Retz. Obf. fasc. 3. 50, cannot belong to it. See *A. maximum* hereafter.

13. *A. aculeatum*. Prickly Oval Amomum. Roxb. n. 3.—Spikes obovate, on short stalks. *Bracteas* lanceolate. Crest of the filament abruptly three-lobed. *Capsules* oval,

prickly. *Leaves* nearly sessile, lanceolate; heart-shaped at the base.—Native of the Malay Archipelago, from whence it was brought to the Calcutta garden, and flowers freely there in April and May, ripening feed in October. The *capsule* is perfectly destitute of grooves, and its coat of a soft fleshy texture. Roxburgh.

14. *A. maximum*. Great Winged Amomum. Roxb. n. 4. (*A. n. 2*; Kœnig in Retz. Obf. fasc. 3. 50?)—Spikes oval, on short stalks. *Bracteas* lanceolate. Crest of one semi-laral lobe. *Capsules* globose, with nine wings. *Leaves* stalked, lanceolate, villous beneath.—Native of the Malay Archipelago. Long cultivated in the Calcutta garden, where it blossoms in April and May, ripening feed in September and October. The *flowers* are nearly white, with a small tinge of yellow on the middle of the *lip*. The *seeds* have a warm pungent aromatic taste, not unlike the real Malabar Cardamom, (see *ELETARIA*), but by no means so grateful. Roxburgh. The author appears to have confused himself between *Globba crispa rubra* of Rumphius, and t. 60, of that writer, but we readily agree with him, though not exactly for the reasons he gives, that neither of these synonyms belong to his *A. maximum*.

15. *A. Rumphii*. Angular-winged Amomum. (*Globba longa*; Rumph. Amboin. v. 6. 134. t. 60.)—Spikes ovate, on stalks thrice their own length. *Bracteas* ovate. *Capsule* globose, with many angular-notched wings. *Leaves* stalked, smooth.—Native of valleys, and at the foot of mountains, in a cold, wet, clay, or stony soil, throughout the Malay Archipelago, and all the eastern parts of India. The barren *stems* are a yard high before they expand into *leaves*, after which they attain the height of twelve or fifteen feet. *Leaves* thin and smooth, two feet or two feet and a half in length, two palms broad. *Flower-stalks* a foot high, scaly, each bearing a dense, ovate, many-flowered spike, three or four inches long. *Bracteas* ovate, acute, reddish, spotted. *Calyx* with a very long three-cleft tube. *Corolla* reddish externally, with a white *lip*, soon fading. *Capsule* nearly globular, with many unequal, yellowish, irregularly and sharply toothed wings. *Seeds* black, enveloped in a silvery pulp, of a gratefully acid flavour, very fragrant, but not acrid or aromatic to the taste. Rumphius.

We cannot reduce this plant to any of the species of Rofcoe, Roxburgh, or Kœnig. We feel indeed great scruples in referring the *Amomum n. 2.* of the latter to *A. maximum*, and shall therefore venture to propose it here as distinct, with that diffidence which must always attend the definition of a species taken up from description.

16. *A. Kenigii*. Single-fruited Amomum. (*A. n. 2*; Kœnig in Retz. Obf. v. 3. 50.)—Spikes sessile. *Bracteas* ovate, membranous. *Capsule* solitary, globose, deeply furrowed, with intermediate wings, and somewhat tuberculated. Crest of three lobes; the middle one rounded, finely toothed. *Leaves* downy beneath.—Native of dense woods in the East Indies. *Leafy stems* two feet high. Spikes or tufts of *flowers* sessile at the root, each perfecting but one *capsule*, the size of a large cherry, containing rarely more than nine seeds.

Although we have made out a far more ample list of species, of genuine *Amomum*, than has ever been attempted before, we are aware that several may yet exit, of which imperfect traces are to be found in various authors, so that it is more likely our number should be augmented than diminished by future enquiry. This genus ought perhaps to be divided into two families, the first with spiked or raemose *flowers*, globular *fruit*, and angular *seeds*; the second with capitate *flowers*, ovate pointed *fruit*, and ovate or oblong, even *seeds*. To the first belong *A. Cardamomum* and many

of our latter species; to the latter the Cardamom tribe, comprising the second and all after it to the eighth inclusive.

AMPHIBOLE, or HORNBLLENDE. See MINERALOGY, *Addenda*.

AMPHIGENE. See LEUCITE.

AMPHIPOGON, in *Botany*, ἀμφί and πογών, as having a beard, or awns, upon both valves of the corolla.—Brown Prodr. Nov. Holl. v. 1. 175.—Clafs and order, *Triandra Digynia*. Nat. Ord. *Gramina*.

Efl. Ch. Calyx of two nearly equal valves, fingle-flowered. Corolla of two valves; outer valve with three fegments; inner with two; all the fegments fetaceous, awned, uniform.

A genus of graffes, growing in patches, with creeping roots, fasciculated stems, and fetaceous leaves. The flowers compofe an equal spike, which fometimes affumes the form of a roundifh head.

SECT. 1. *Spike capitate, the outermoft flowers abortive, colored, conflituting a kind of involucrem. Calyx hairy.*

1. *A. laguroides*. Hare's-tail Amphipogon.—Head globose. Calyx-glumes hippid, with hairs dilated at the bafe; outer valve twice the length of its point.—Gathered by Mr. Brown, on the fourth coast of New Holland.

2. *A. turbinatus*. Turbinate Amphipogon.—Head obovate. Calyx-glumes clothed with shaggy hairs, fimple at the bafe; outer valve fcarcely longer than its point.—From the fame country.

SECT. 2. *Spike oblong. Calyx fmoth.*

3. *A. striatus*. Stiff Amphipogon.—Calyx-glumes fringed, undivided, fhorter than the fmoth corolla. Awns and leaves ftraight.—Found by Mr. Brown, near Port Jackson, New South Wales.

4. *A. debilis*. Weak Amphipogon.—Calyx-glumes three-cleft, fhorter than the fmoth corolla. Awns ftraight. Leaves rather flaccid.—Gathered by the fame on the fourth coast of New Holland.

5. *A. avenaceus*. Oat Amphipogon.—Calyx-glumes pointed, undivided, longer than the filky corolla. Awns fpreading.—Native of the fame country as the laft.

We have feen no fpecimens, and therefore are indebted to Mr. Brown for all the above information. We would obferve that this genus affords an exemplification of what fpecific characters ought to be, under the hand of a mafter, with nothing ambiguous or fuperfluous, but fuch a contrail of diftinctions between all the fpecies, as can leave no doubt in the mind of a ftudent.

AMPHORA. Add—As a wine meafure at Venice, contains 4 bigoncia, and a bigoncia contains 4 quantari, 116 fecchie, or 256lbs. peso grofo; but a bigoncia of brandy is only 14 fecchie, or 56lbs.

AMSTERDAM, in *Geography*, an ifland in the Indian fea, lying in S. lat. 38° 42'. E. long. 76° 54'. This ifland is of volcanic origin, and fill in a ftate of inflammation. The great crater on the eastern fide, now full of water, is by far the largeft here, or, perhaps, elfewhere, and is of an aftonifhing fize, confiderably exceeding in diameter thofe of Etna or Vefuvius. Its length from N. to S. is upwards of four miles; its breadth from E. to W. about 2½ miles; and its circumference 11 miles, comprehending a furface of about eight fquare miles, or 5120 acres, almoft the whole of which is covered with a fertile foil. The ifland is inaccessible, except on the eaft fide, where the great crater forms a harbour, the entrance into which is deepening annually, and might, by the aid of art, be made fit for the paffage of large fhips. The tides run in and out at the rate of three miles an hour; and rife perpendicularly eight or

nine feet on the full and change of the moon. Their direction is S.E. by S., and N.E. by N. A northerly wind makes the higheft tide. The water is eight or ten fathoms deep almoft clofe to the edge of the crater. The fea fupplies this ifland with excellent fifh, particularly a kind of cod, and cray-fifh in abundance. Nevertheless, fharks and dog-fifh, of uncommon fize, were very numerous in the fame place. The penguin, diftinguifhed in the Linnæan fyftem by the name of “Chrylocoma,” having large yellow feathers, forming two femi-circles over the eyes, like eyebrow, is found here in great abundance. Of the larger birds, here are alfo feveral fpecies of the albatros, and alfo the large black petrel, or “procellaria equinoctialis” of Linnæus; the blue petrel, or “procellaria Forfteri;” and the stormy petrel. The fmalleft of the feathered tribe, inhabiting or vifiting this ifland, was the filver kind, or “Isterna hirundo,” about the fize of a large fwallow or fwift, with a forked tail. The ifland St. Paul's, lying to the northward of Amfterdam, prefented no very high land, or any rifing in a conic form. In fir George Staunton's Embaffy to China, we have a view and plan of the ifland of Amfterdam, and of the great crater on its eaftern fide.

AMUL, an ancient city of the Perfian empire, in the province of Mazanderan, fituated in an agreeable plain at the foot of a mountain, on the banks of a river, and celebrated for a handfome bridge of twelve arches, an old fortrefs, and a palace of Shah Abbas the Great.

AMURATH (or MORAD) III., in *Biography*, fucceeded his father fultan Selim II. in 1575, commencing his reign with caufing his five brothers to be ftangled in his prefence. His reign was eventful in military tranfactions; but as he took no part in them, he is not much noticed by the Turkish hiftorians. Amurath contributed to the election of Stephen Batori, as king of Poland; and this circumftance favoured his own defigns againft Perfia. The invafion of this empire by the Turks began in 1578, and after much flaughter, terminated in Amurath's poffeffion of Tauris, and three contiguous provinces of Perfia. The Krim Tartars, who revolted from the Turkish dominion, were reduced. In 1590, Amurath being at peace with the other powers declared war againft the emperor of Germany, which was the caufe of much devaftation and bloodfhed; and the Turks triumphed in the capture of the important town of Raab, in Upper Hungary. During this war, Amurath died, in January 1596, at the age of 52. Chriftian authors reprefent him as of a mild difpofition, a lover of juftice, zealous in his religion, and a friend to temperance and order. Mod. Univ. Hift.

AMURATH (or MORAD) IV., furnamed *Ghazi*, or the Valiant, was fon of Achmet I., and fucceeded his depofed uncle Muftapha in 1622, in his 13th year. He loft Bagdad at the beginning of his reign; and after many unfeceful attempts to retake it, he marched, in 1637, at the head of a numerous army, and after thirty days continual affault, and an immense lofs of lives, ftormed the place. On this occafion he fhewed the brutal ferocity of his temper, not only by driving on his men with a fcytetar to the attack, but by flaughtering 30,000 Perfians who had furrendered at difcretion after the capture of the town. It is faid, that the only perfon who efaped was a famous harp-player, who requefted the executioners to permit him to fpeak to the fultan before his death. When introduced into his prefence, and ordered to give a fpecimen of his powers, he touched his inftrument fo fweetly, accompanying the ftrains with pathetic lamentations on the tragedy of Bagdad, and artful praifes of Amurath, that the tyrant was foftened

softened to tears, and not only saved him but the rest of the survivors. Habits of debauchery broke down the sultan's constitution in the prime of life, and he sacrificed his life in a revel at the feast of Bairam, in February 1640, at the age of 31. — Mod. Univ. Hist.

AMUSKEAG FALLS, l. 10, for acrofs r. a little below.

AMWELL. Add—Also, a township of Hunterdon, in New Jersey, containing 5277 inhabitants.—Also, a township of Pennsylvania, in Washington county, having 1673 inhabitants.

ANADENIA, in *Botany*, so named by Mr. Brown, from α , without, and $\alpha\delta\eta\nu$, a gland, because the nectariferous glands, usual in some neighbouring genera, are wanting.—Brown Tr. of Linn. Soc. v. 10. 166. Prodr. Nov. Holl. v. 1. 374.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceæ*, Juss. Brown.

Gen. Ch. Cal. none. Cor. Petals four, equal, regular, cohering by their lower part into a tube, linear, at length revolute; their summits dilated, concave, bearing the stamens. Stam. Filaments four, very short, inserted into the hollow near the tip of each petal; anthers roundish, sunk in the fallid hollow. Pist. Germen with rudiments of two seeds, superior, stalked, half-ovate, erect, without any gland at the base; style cylindrical, incurved; stigma vertical, conical. Peric. Follicle stalked, of one cell, crowned with the style. Seed solitary, compressed, without a wing.

Eff. Ch. Petals four, regular. Stamens sunk in the cavities of the limb. Nectariferous glands none. Stigma conical. Follicle of one cell. Seed solitary, without a wing.

A shrubby genus, akin to GREVILLEA. (See that article.) Leaves either pinnatifid or lobed, their outline wedge-shaped. Spikes terminal or lateral; flowers in pairs, each pair accompanied by a single bractea, the uppermost sometimes earlier than the rest.

1. *A. pulchella*. Elegant Anadenia.—Leaves pinnatifid, slightly hairy; lobes wedge-shaped, three-cleft or pinnatifid at the extremity. Spikes flowering from the top downwards. Follicles glutinous.—Native of stony hills in Lewin's land, on the fourth coast of New Holland, where this, as well as the two following species, were gathered by Mr. Brown.

2. *A. trifida*. Three-cleft Anadenia.—Leaves wedge-shaped, triple-ribbed, without veins, three-cleft; silvery beneath: lobes entire, or the lateral ones with two or three teeth.—Found in woods, on a sandy soil, in Lewin's land. Leaves only the length of the finger-nail. "Perhaps a distinct genus, the corolla being irregular, stigma a little different from the rest, and the follicle woody, splitting into two parts." Br. in Tr. of Linn. Soc.

3. *A. ilicifolia*. Holly-leaved Anadenia.—Leaves wedge-shaped, veiny; silvery beneath; tapering at the base; pinnatifid half way down.—Found on the sandy sea-coast of Flinder's land, on the fourth coast of New Holland, with unexpanded flowers, and no fruit. Leaves an inch long. Brocan.

ANAGNORISIS. See CATASTROPHE.

ANALCIME. See ZEOLITE.

ANALYSIS, in *Chemistry*. The analysis of minerals, including earths, stones, and the ores of metals, and the analysis of organized bodies, or vegetable and animal substances, have been omitted; we shall, therefore, introduce a summary account of these subjects here, and at the same time endeavour to supply what has been omitted under other analogous heads.

Analysis of Minerals.—The particular methods of ana-

lyzing different minerals and ores are given under their respective heads: our object here is to give a summary view of chemical analysis in general, a subject often referred to in the Cyclopædia, but which has been unaccountably omitted.

"The progress," says Dr. Thomson, "which the art of analysing minerals has made within these last thirty years is truly astonishing. To separate five or six substances intimately combined together, to exhibit each of them separately, to ascertain the precise quantity of each, and even to detect the presence of the weight of substances which do not approach the five-hundredth part of the compound, would, at no very remote period, have been considered as a hopeless, if not an impossible task; yet this can now be done with considerable accuracy."

Margraff of Berlin was the first who undertook the analysis of minerals. He was followed by Bergman and Scheele, who very much improved this department of chemistry. The indefatigable and ingenious Klaproth succeeded, to whom the present improved state of the analysis of minerals is more indebted than to any other individual. To Vauquelin and Berzelius likewise we are much indebted, as well as to many other eminent living chemists. In short, this interesting branch of chemistry is still daily making rapid progress, and will doubtless ere long become much more perfect than it is even at present.

Minerals of a saline nature, and soluble in water, may be analysed by the methods pointed out in the article WATER, *Mineral Analysis* of.

Hard stony minerals are first to be reduced to a state of powder. When they are extremely hard, they may be heated to redness, and then thrown into cold water, which will cause them to crack and fly to pieces; and this process may be repeated, if necessary. The mineral is then to be reduced to a coarse powder, in a steel or agate mortar (see LABORATORY); and when thus reduced, a given weight of it, 100 grains for example, is to be reduced in a similar mortar (one of agate is preferable) to an impalpable powder. The powder, after this operation, will be generally found heavier than before, owing to the abrasion of the mortar; and this addition in weight is to be carefully noticed, and allowed for. If the mortar employed was agate, the addition in weight may be considered as filix.

Crucibles of platinum and silver, evaporating dishes of glass or porcelain, and other apparatus and requisites, will be necessary for the subsequent processes, all which are described under the article LABORATORY above referred to. In the class of minerals commonly denominated *stones* and *earths*, the ingredients usually met with are, silica, alumina, zirconia, glucina, lime, and magnesia; and the oxys of iron, manganese, nickel, chrome, and copper. Seldom more than four or five of these, however, enter the composition of a mineral at the same time; though, to avoid repetition, we shall suppose them all to exist at once.

When a mineral of the above description is to be analysed, 100 grains of it in fine powder are to be mixed with three times their weight of pure potash and a little water, and then introduced into a silver crucible, and exposed to a red heat for upwards of half an hour. Care must be taken to stir the mixture well till all the water be driven off, lest, by the ebullition, any of the compound should be forced out of the crucible.

From the appearances presented during this step of the operation, some conjectures may be usually formed respecting the nature of the stone, so as to afford some assistance in the future steps of the analysis. If the matter melts completely, it may be concluded that the mineral is chiefly

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siliceous. If it remains thick and opaque, the other earths are most abundant. If it assumes the form of a pulverulent bulky white powder, the stone is mostly argillaceous. If the colour be dull green or brownish, oxyd of iron is present. A bright grass-green indicates the presence of manganese, and yellowish-green chrome. When a stone is aluminous and very hard, potash acts very feebly upon it; and in this case, borax was used with great advantage by Mr. Chenevix.

The crucible being now removed from the fire, and cleaned externally, is to be placed in a porcelain capsule, and filled with water; and this is to be repeated till the whole of the matter is separated. A portion of the compound of potash, with the flux and alumina of the mineral, is taken up by the water, which would indeed dissolve the whole if added in sufficient quantity.

The detached matter is then to be dissolved in muriatic acid: at the commencement of the solution, an abundant precipitation takes place of a flocculent matter, which had been held in solution by the alkali, with which the acid combines. Then an effervescence takes place from the decomposition of the alkaline carbonate formed after and during the fusion, and at the same time the precipitate is redissolved. The portion of matter also not dissolved by the water, and which had remained at the bottom in the form of a powder, is dissolved; this not being attended with any effervescence, if it be alumina or flux; but if it contains lime, an effervescence takes place. If the muriatic solution be colourless, we may conclude that it contains very little or no metallic oxyd. If its colour be purplish-red, it is a further proof that manganese is present; orange-red indicates iron; and golden-yellow, chrome.

This solution is now to be evaporated to dryness upon a sand-bath, in a flat porcelain vessel loosely covered with paper. Towards the end of the operation, the fluid becomes gelatinous, and requires to be constantly stirred with a silver or porcelain rod, to facilitate the disengagement of the water and acid, and to render the exsiccation uniform throughout the whole. If this precaution be not observed, there is a risk of a portion of the alumina, from which the acid has been expelled, remaining with the flux; and with the alumina of a portion of flux being retained in solution; by the acid on account of its not being sufficiently dissipated.

When the matter is almost reduced to the form of a dry powder, a large quantity of distilled water is to be poured upon it; the whole is then to be gently heated, and thrown upon a filtre. The powder remaining on the filtre is to be washed with water, until the last portions added give no precipitate with solution of silver. This powder is *flux*. It is to be carefully dried between folds of blotting paper, exposed afterwards to a red heat, and weighed while warm. It ought to be a fine white powder, insoluble in acids. If it be coloured, the presence of a metallic oxyd is indicated, which is a proof that the heat towards the end of the evaporation had been raised too high. To remove this oxyd, the powder is to be boiled with an acid, and afterwards washed and dried, and the liquor must be added to the filtered fluid above-mentioned.

The solution is then to be evaporated till its quantity does not exceed an English pint. A solution of carbonate of potash is to be poured in, till no farther precipitation takes place; and in order to render the separation more complete, the whole should be boiled for a few minutes. When all the precipitate has collected at the bottom, the supernatant liquor is to be decanted off; and water being substituted in its place, the precipitate and water are to be thrown upon a filtre. When the water has passed

through, the filtre with the precipitate upon it is to be placed upon some folds of bibulous paper; and when the precipitate has acquired a little consistence, it is to be carefully collected with an ivory knife, and mixed with a solution of pure potash, and boiled in a porcelain crucible. If any alumina or glucina be present, they will be dissolved in the potash, while the other substances remain untouched in the form of a powder.

The solution of alumina in the potash is to be super-saturated with an acid, that is, so much acid is to be added as is sufficient to redissolve any precipitate that may be formed. Carbonate of ammonia is then to be added in excess, so as to be sensible to the smell. This will precipitate completely the alumina, if any be present, while the glucina will remain in solution. The alumina is to be collected on a filtre, washed with distilled water, and then dried at a red heat, and weighed. To determine if it be really alumina, dissolve it in sulphuric acid, and add a sufficient quantity of sulphate or acetate of potash; if it be alumina, the whole of it will be converted into crystals of alum. If glucina be present in the remaining liquor, it will fall down on boiling it for some time, so as to dissipate the excess of ammonia. After being washed and dried as before, it is to be accurately weighed.

The matter remaining undissolved by the solution of potash above-mentioned may consist of lime, magnesia, yttria, and the metallic oxyds. If yttria be suspected, add carbonate of ammonia, which will dissolve the yttria, and leave the other bodies. Then let the whole be dissolved in dilute sulphuric acid, and the solution be afterwards evaporated to dryness, so as to dissipate any excess of acid. A little water is to be added to the solid residuum, which will take up the metallic sulphates and the sulphate of magnesia, but leave the sulphate of lime, which is to be dried at a red heat, and weighed; and from its weight the quantity of lime present may be readily estimated. The substances retained in solution by the sulphuric acid may be magnesia and the oxyds of iron, manganese, chrome, and nickel. To separate these, the solution is to be diluted with a large quantity of water, a slight excess of acid added to it; and then a solution of carbonate of potash saturated with carbonic acid is to be poured in. The oxyds of iron, chrome, and nickel, will be precipitated, while the magnesia and manganese will remain in solution with the carbonic acid. To separate these, hydro-sulphuret of potash well saturated with sulphuretted hydrogen is to be added to the solution, which will precipitate the manganese in the state of hydro-sulphuret, while the magnesia will still remain in solution. The magnesia may then be separated by a solution of pure potash, and its weight estimated after it is washed and dried at a red heat. To obtain the weight of the *oxyd of manganese*, its precipitate must be calcined with the admission of air to expel the sulphuretted hydrogen.

There still remain to be separated the oxyds of chrome, iron, and nickel. To do this, the precipitate is boiled in successive portions of nitric acid, to bring the oxyd of chrome to the state of acid. It is then heated for a few seconds with potash, and after being heated the liquid is poured off. The undissolved matters are to be washed with water, which washings are to be added to the other liquid. The chromic acid remains in solution combined with the potash; muriatic acid is added to it, so as to be in excess; it is then evaporated until it assumes a green colour. If pure potash be then added, the *oxyd* will be precipitated, and it may thus be collected, and its quantity ascertained.

The undissolved matter of the preceding experiment may consist of the oxyds of iron and nickel. To separate them, they

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they are dissolved in muriatic acid, and ammonia is added in excess. The *oxyl of iron* will be thus precipitated, and its weight may be ascertained. The excess of ammonia will retain the *oxyl of nickel* in solution, which may be lastly obtained separately by driving off the ammonia by heat.

When the different constituent principles of a fossil have been thus obtained separately, their united weight ought of course to be equal to the original weight of the fossil itself. If they correspond, or differ only by .03 or .04 of a part, we may conclude that the analysis has been properly performed. But if the loss of weight be considerable, the analysis must be repeated; and if the result be still the same, it may be concluded that the stone has contained some principle either volatile or soluble in water, which must, therefore, be sought for. A proportion of the stone being broken to pieces, is first to be exposed to a strong heat in a retort of porcelain, to which a receiver is adapted. If it contains water, or any other volatile substance, this will be collected in the receiver, and its nature and quantity may be ascertained. But if it sustain no loss by this operation, or a loss not equivalent to the loss indicated by the analysis, it is probable that it contains some substance soluble in water.

To ascertain the quantity of *potash* present in a mineral, Vanquelin (from whom the above account of the analysis of stony bodies has been chiefly extracted) recommends that the stone reduced to an impalpable powder should be cautiously heated with sulphuric acid, and the mass digested with water. The solution properly concentrated is set aside for some days. If crystals of alum make their appearance, the stone contains *potash*. If no crystals appear, the solution is to be evaporated to dryness, and the residue exposed to a moderate red heat. It is then to be digested in water, and the solution mixed with carbonate of ammonia, and filtered. It must be then again evaporated to dryness, the residue exposed to a heat of 700°, and redissolved. The solution by proper concentration will yield crystals, either of sulphate of soda or of potash, which may be readily distinguished. The presence or absence of potash may be also ascertained by means of the muriate of platinum.

The following method has been recommended by Rofe for detecting and distinguishing the fixed alkalis in minerals, and is easier than the above. He fused one part of the mineral with four parts of nitrate of barytes in a porcelain crucible. A spongy mass of a light blue colour, and completely soluble in muriatic acid, was obtained. The yellow-coloured solution formed was mixed with a sufficient quantity of sulphuric acid, not only to precipitate the barytes, but to expel the muriatic acid; and the liquid was evaporated to dryness. The mass was digested in water, and thrown upon a filter. The sulphate of barytes and silica remained behind. The solution was now saturated with carbonate of ammonia, which separated all the earthy and metallic bodies, leaving in the solution only the sulphates of fixed alkali and ammonia, the latter of which was then expelled by heat. The fixed alkaline sulphate thus obtained was redissolved in water, and decomposed by means of the acetate of barytes. The sulphate of barytes formed was then separated by the filter, and the liquid evaporated to dryness. The other salt was acetate of a fixed alkali, which was exposed to a red heat in a crucible, the charry residue dissolved in water, filtered, and crystallized; and thus a fixed alkaline carbonate was obtained, easily distinguished by its properties.

Sir H. Davy adopted still a different method. He fused one part of the mineral with two parts of boracic acid, dissolved the fused mass in diluted nitric acid, and concentrated the solution to separate the silica. The liquid was

then mixed with carbonate of ammonia in excess, and boiled and filtered; by which means all the earthy and metallic ingredients were separated. The liquid was then mixed with a sufficient quantity of nitric acid, and evaporated till the whole of the boracic acid separated. Nothing now remained but the nitric acid, combined with the alkaline constituents of the mineral, and with ammonia. The nitrate of ammonia was dissipated by heat, and the nature of the alkaline nitrate left was easily distinguished by its properties.

When the mineral contains *fluoric acid*, Klaproth ascertained its presence by heating the mineral with sulphuric acid in a glass retort. The corrosion of the retort, and the siliceous deposit in the water of the receiver, sufficiently demonstrate the presence of that principle. To determine its quantity, the mineral was fused with potash, and the silica separated as usual. The remaining liquid was precipitated by means of the carbonate of potash; and the liquid being neutralized was mixed with lime-water. The precipitate of fluuate of lime thus obtained was heated to redness, and from its weight the quantity of fluoric acid present in the mineral was estimated.

Those fossils in which earths are combined with acids, forming compounds not soluble in water, require different modes of analysis. The earthy carbonates are analyzed by calcination by heat, with or without charcoal, or by solution in dilute nitric or muriatic acid; estimating the quantity of carbonic acid disengaged, by collecting it, and discovering the base by the nature of the salt obtained by evaporation; or by precipitation by re-agents, and estimating by the same modes their quantities. Earthy sulphates may be decomposed by boiling with carbonate of potash for a considerable time: the sulphuric acid unites with the potash, and its quantity may be estimated by precipitating with barytes: the carbonic acid is attracted by the earthy base, and the carbonate thus obtained may be decomposed in the same manner as a native carbonate, or the quantity of earth which it contains may be estimated by its weight. Phosphate of lime, which is the only earthy phosphate that has been discovered, may be dissolved in diluted nitric acid by the assistance of heat; the lime may be then precipitated by sulphuric or oxalic acid; the phosphoric acid remaining in solution may be obtained concrete by evaporation; or its quantity may be estimated by combining it with lead, a solution of acetate of lead being added for the purpose.

Analysis of Ores.—Metallic minerals, in general, admit more easily of analysis in the humid way than the earthy fossils, from their being less hard. In the dry way also, their composition may be sometimes ascertained by expelling the mineralizing substance by heat, and reducing the metal to its metallic state.

Proper specimens of the ore, free from all foreign matters, should be chosen; and if the object be to ascertain the quantity of metal it may contain, different specimens taken from different parts of the metallic vein should be examined, as it often happens that different parts of the same vein vary much in richness. The ore being powdered, the general process, in the dry way, consists in calcining it at a low red heat in an earthen vessel loosely covered, to expel the sulphur or other volatile matter. Or this operation may be performed in an earthen retort and receiver, when the object is to ascertain the nature and quantity of the substance expelled. The residual matter in either case being weighed, to ascertain the loss of weight it has suffered, is mixed with three times its weight of black flux, and exposed in a crucible, to a heat sufficiently intense for its reduction and fusion. Sometimes borax, pounded glass, or lime, are used

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as fluxes. The metallic matter, when the operation is well conducted, is collected in a button at the bottom of the crucible, and its nature and composition may be ascertained in the humid way in the usual manner by means of the proper re-agents, &c.

In submitting an ore to analysis in the humid way, the general process is to digest it previously reduced to powder in different acids. Sulphur, if present, is precipitated, or is sometimes partially converted into sulphuric acid. If the quantity of sulphur be large, it is best previously separated as much as possible by roasting the ore as above. The residual matter is then submitted to the action of the different acids, these being often applied successively; so that different metals, if present, are separated by their proper solvents. The solutions afford by evaporation the metallic salts they contain, or each metal is detected in the solution by its proper test: it is also precipitated by the alkalis and other re-agents, and the precipitate is reduced to the metallic state, as before, by the aid of fluxes and heat; or sometimes it may be thrown down at once in the metallic state, by another metal having a stronger attraction for oxygen.

These are almost all the general rules that the analyses of ores will admit of, as the processes required for different ores differ extremely from one another, and are often very complicated. We refer our readers, therefore, for the analysis of particular earthy fossils and ores, to the different articles in the Cyclopædia, where they are described.

Analysis of organized Bodies, including vegetable and animal Substances.—The older chemists attempted the analysis of organic compounds by distillation, and thus obtained a variety of resulting substances equally or perhaps more complicated in their nature than the original substance to be analysed. When the theory of chemistry was changed by Lavoisier, that illustrious chemist began to consider the composition of organic substances in a proper point of view, and he endeavoured to discover the elements of these bodies, and to determine their proportions. He discovered the nature of their elements, though he was not so successful in determining their properties. Lavoisier's principle of analysis was to oxidize organic bodies till he converted them into binary oxys, the composition of which was known, and to perform the experiment in such a manner, that the quantity of these binary compounds with oxygen could be correctly determined. His mode of operating was to burn organic substances in oxygen gas; but this method, though just in principle, did not enable him to determine by the balance with much accuracy, either the quantity of water or of carbonic acid formed by the combustion; so that his results could be only considered as approximations.

Some chemists, after Lavoisier, endeavoured to determine the exact quantity of the products of dry distillation, and to calculate from them the composition of the body. Such was the attempt of Fourcroy and Vauquelin on the composition of urea, and of Dr. Higgins on the acetic acid. But the composition, and probably also the quantity of the products of distillation, being only imperfectly known, it is obvious that such experiments, however exact, can only afford data for calculations hereafter, when the products of the distillation come to be better examined and more accurately known. Theodore de Saussure has analysed alcohol and ether in Lavoisier's manner, and the results he obtained probably approach nearer the truth than any preceding analysis of a ternary compound. Thenard has also analysed different species of ether in the same manner.

The first grand step, however, towards proportion in the analysis of organic substances, was made by Gay Lussac and Thenard. These celebrated chemists, in an

interesting memoir on the subject, after pointing out the difficulties and sources of inaccuracy of the methods then generally employed, gave a description of a new method of proceeding, by which they considered they were able to combine the hydrogen and carbon with the utmost quantity of oxygen with which they can unite; and thus, by proper data, to eliminate the proportion of their constituent parts, and of oxygen existing in the compound analysed. The substance selected to furnish oxygen was the oxymuriate of potash, and the matter to be analysed was mixed with this salt, and deflagrated in an apparatus contrived for the purpose, consisting of a thick glass tube, A, (*Plate XXI. fig. 3. Chemistry.*) set vertically in a fire, with a lateral tube, B, to conduct the gases produced to a mercurial apparatus; and a cock, C, above, the stopper of which was not perforated, but contained a depression, D, into which a portion of the material to be analysed was introduced; and by turning the cock downwards, this portion fell into the tube, and was there deflagrated. E is a vessel containing ice, to keep the upper part of the tube cool. The proportion of the oxymuriate requisite to burn completely the substance analysed was ascertained by previous trials in an open crucible; so much of the salt being required, that the residue after deflagration should be quite white, or at least not carbonaceous; and in the actual experiment a considerable excess of the oxymuriate was employed. The materials were then completely dried, by submitting them for a considerable time to a temperature of 212°, and afterwards accurately weighed and mixed in a mortar, with a little water, so as to form an adhesive mass, which was divided by being thrust into a brass mould, and the pieces shaped by the fingers into little balls, that they might drop clean from the stopper of the cock down into the deflagrating tube. These balls were dried again at the same temperature before they were thus burnt.

The oxymuriate of potash was itself analysed before it was used; and in order to insure uniformity in its composition, a considerable quantity of it was fused and pulverised, and kept for use. If the substance to be analysed was a vegetable acid, it was combined with lime or barytes before it was mixed with the salt; and this calcareous or barytic salt was separately analysed, and the carbonic acid remaining united with the earth after deflagration was properly estimated. The earthy or other incombustible matter belonging to the substance to be examined was also separately estimated, by calcining this substance by itself in a platinum vessel, and lixiviating the residue.

The authors, in their memoir, have given at length all the precautions required in the management of the apparatus, both in preparing for the deflagration, and in the estimation of the gases obtained; and after the operation the results of the analysis were made out in the following manner: "The proportion of combustible matter in the substance examined was previously found by calcination of another portion of the same; the actual quantity of oxygen employed in the deflagration was known by that of the oxymuriate used; the carbonic acid was absorbed by potash, and its carbon estimated; the excess of oxygen was found by subsequent detonation with hydrogen; the hydrogen of the substance was presumed to form water with all the oxygen unaccounted for; and the azote existed in the residual azotic gas."

Soon after the method of Gay Lussac and Thenard was published, Berzelius turned his attention to the same subject; and after bestowing, in his admirable essay, some just encomiums on the merits of his predecessors, proceeds to point out some defects in the apparatus and methods they employed, and proposes new ones of his own. The essential

tial principle of Berzelius's method is the same as that of Gay Lussac and Thenard, *viz.* the complete combustion of the substance to be analysed with the oxy-muriate of potash; but the apparatus he employed was very different, and certainly much better adapted for the purpose. It consisted of a glass tube, between one-half and five-eighths of an inch in diameter, and of a length sufficient to contain the mixture of the salt and substance to be analysed. This tube was hermetically sealed at one end, and at the other of the shape represented at A 1, (*Plate XXI, fig. 4, Chemistry*), in order to facilitate the introduction of the mixture. When the mixture was introduced, this end was drawn into the shape A 2, in order to adapt its introduction into the small thin receiver B. C is a tube about twenty inches long, and a quarter of an inch in diameter, filled with dry muriate of lime in a state of coarse powder; from one extremity of this, a bent tube D was connected with a small mercurial gageometer E; in this was introduced a small globular glass vessel F, containing caustic potash, with the view of absorbing the carbonic acid. All the joinings in this apparatus were made by small caoutchouc tubes, prepared by cutting thin pieces of that substance into the requisite shape, and pressing the newly cut edges together, which unite readily. The tube exposed to the fire was surrounded by a thin piece of tin plate, secured by wire to prevent its bursting. The apparatus was so managed, that by shifting the piece G the whole length of the tube could be heated in succession by the fire H, and thus the slow and uniform combustion of the whole substance be ensured. The other parts of the apparatus will be readily understood from inspection of the figures. At the end of the operation, the greater part of the water formed was found collected in the small receiver B; the remainder of course was found in the tube C, absorbed by the muriate of lime; and by subtracting the known weights previously ascertained of these portions of the apparatus, from their weights after the experiment was concluded, the quantity of water was accurately determined. The greater portion of the carbonic acid was attached to the potash in the vessel F, and its quantity ascertained by weight. The minute portion adhering to the soda derived from the oxy-muriate of soda was ascertained as nearly as possible by estimation. The substances analysed were all carefully dried at 212° in a vacuum with sulphuric acid, and were generally combined with oxyd of lead. The quantity burnt was from five to eight grains of the substance with thirty or forty grains of the oxy-muriate of potash. For further particulars we refer our readers to Thomson's *Annals of Philosophy*, vols. iv. and v.

Berzelius was induced to adopt the use of the oxy-muriate of potash from the recommendation of Gay Lussac and Thenard. Before that time he had employed the brown oxyd of lead.

In the analysis of animal substances, and all compounds into which azote enters, the use of the oxy-muriate of potash is very troublesome, and liable to great objections from the uncertain state of oxydation of the azote. It became, therefore, an object of the first importance to possess a substance that would oxydize hydrogen and carbon, but not azote; such a substance has been happily lately pointed out by Gay Lussac. This is the black oxyd of copper, which at a low heat, scarcely amounting to redness, parts readily with its oxygen to hydrogen and carbon, but not to azote. Berard, Dr. Prout, and others, have taken advantage of this in their recent analyses of several animal substances, as will be mentioned under their proper heads. The apparatus employed by Dr. Prout closely resembles that of Berzelius described above, but is more simple.

Dr. Prout in general prefers making separate experiments for ascertaining the gaseous and aqueous products, for the former of which he uses a simple tube only; for the latter, a tube with a small ball, analogous to the receiver of Berzelius, connected with a tube filled with dry muriate of lime. See for further particulars *Medico-Chirurgical Transactions*, vol. viii.

ANALYSIS of Soils. See SOILS.

ANALYSIS of Mineral Waters. See WATER.

ANAMENIA, in Botany, a name corrupted by Ventenat, *Jard. de la Malmaison*. t. 22, from the Arabian appellation of some flowers of the family of *Adonis* and *Anemone*, *Anabamen*, to which the present genus is related. See KNOWLTONIA.

ANARHICHAS, l. 6. The species of this genus enumerated by Gmelin are, *Lupus, Minor, Pantherinus*, and *Strigofus*.

LUPUS; shark, or wolf-fish. (See *LUPUS Marinus*.) This fish commonly frequents the deep parts of the sea, but in spring-time approaches the coasts, in order to deposit its spawn among the marine plants, &c. It is taken both in nets and by the line; and though the flesh is tolerable, its disgusting appearance prevents its being much used as food, except by the fishermen. The Greenlanders, however, eat it, both fresh and dried, and make convenient fatchels of the skin, in which they keep various kinds of utensils.

MINOR. Cinerous, black, with sharper cartilaginous teeth: found near Greenland.

STRIGOSUS, with transverse dusky bands, racemose and somewhat less regular than usual; supposed by Dr. Shaw to be merely a variety: found in the British ocean.

PANTHERINUS; Panther wolf-fish, marked over the whole body with round brown spots. This is allied to the first species, but differs much in colour, being of a deep yellow, variegated with numerous, round, deep-brown or blackish spots of different sizes, the largest being on the back, upper part of the sides, and dorsal fin: its length is about three feet or more. A native of the Northern seas.

ANARTHRIA, in Botany, from *anarthros*, destitute of joints, because the stems are, in the unbranched species of this genus, destitute of knots, or articulations.—Brown *Prodr.* Nov. Holl. v. i. 248.—Class and order, *Dioecia Triandria*. Nat. Ord. *Tripetaloideae*, Linn. *Junci*, Juss. *Reflicoseae*, Brown.

Edl. Ch. Male, Petals six, nearly equal. Filaments distinct. Anthers didymous, cloven at each end.

Female, Petals six, nearly equal. Styles three. Capsule three-lobed, three-celled. Seeds solitary.

The root is perennial. Stems compressed, simple, sometimes branched in a proliferous manner; when simple they are without joints, and without sheaths, having at the base vertical, equitant, two-ranked leaves. Spikes terminal, compound, each branch subtended by a sheathing deciduous bractea; sometimes they are simple, or the flowers are solitary. The capsules in some species form a kind of catkin, scarcely bursting. The structure of the flowers and fruit comes nearest to *Elegia*, but the want of sheaths upon the stem, and the equitant vertical leaves, make a wide difference. This genus agrees with *LYGINIA*, (see that article,) in having twin anthers, but differs altogether in habit.

1. *A. scabra*. Rough-edged *Anarthria*.—Stems perfectly simple, flat, rough-edged as well as the leaves. Petals of the male linear; of the female the three innermost are smallest.—Found by Mr. Brown on the fourth coast of New Holland.

2. *A. leviss*. Smooth-edged *Anarthria*.—Stems perfectly simple, flattish, smooth-edged as well as the leaves. Petals of

of the male elliptic-lanceolate; of the female all nearly equal.—From the same country.

3. *A. gracilis*. Slender Anarthria.—Stems perfectly simple, thread-shaped, compressed, resembling the leaves, and likewise smooth-edged. Spike racemose, divided. Petals lanceolate, keeled, nearly equal.—Native of the same country.

4. *A. pauciflora*. Slender-clustered Anarthria.—Stems simple, thread-shaped, compressed, nearly resembling the solitary leaf, and likewise smooth. Cluster loose, of few flowers. Flower-stalks in pairs, unequal, shorter than the sheathing bractea.—The male plant only was gathered by Mr. Brown, on the southern coast of New Holland.

5. *A. prolifera*. Proliferous Anarthria.—Stems branched in a proliferous manner, two-edged, leafy. Flowers either solitary or somewhat spiked.—Found in the same part of New Holland as all the preceding. *Brown*.

ANATHO. For ANAH *r.* ANNA.

ANATOMY, *Picturesque*, col. 4, l. 15, for head *r.* face.

ANCHOR, in *Architeûre*, &c. l. 3, for Tufcan *r.* Doric.

ANDALUSITE. See MINERALOGY, *Addenda*.

ANDANTE, l. 2, *dele* or *graziioso*; l. 5, *r.* or rather *graziioso*.

ANDERSONIA, in *Botany*, received that denomination from the pen of Mr. Brown, in honour of three different botanists of the name of Anderson. First, Mr. William Anderson, surgeon in the navy, the companion of captain Cook in two separate voyages, during the latter of which he died. Although most devoted to the study of man, and of the animal kingdom, in those new and remote regions which it was his lot to visit, he did not overlook the vegetable world. Several of his manuscript descriptions exist in the Banksian library, where characters of some new genera, since published under other names, are to be found. The genus in question also serves to commemorate Mr. Alexander Anderson, curator of the botanic garden at St. Vincent's, so important, in a national point of view, as a nursery for tropical plants, and for their interchange between our several colonies. Thirdly, this genus is well merited by a most assiduous and observing cultivator and botanist, Mr. William Anderson, F.L.S., now superintendent of the Apothecaries' celebrated garden at Chelsea. Let the writer of this be allowed to subjoin to Mr. Brown's list of these botanical worthies, the name of his lamented friend Mr. George Anderson, F.L.S., whose early death, owing to a melancholy accident, January 10th, 1817, is a real loss to science. No one had paid more attention to the cultivation and distinction of the different kinds of British *Salices*, or the beautiful exotic tribe of *Pæonia*; on which last subject a paper in the Linnæan Society's *Trans.* v. 12. 283, published under the care of his able friend Mr. Sabine, will always evince Mr. George Anderson's just claim to botanical commemoration.—*Brown Prodr. Nov. Holl.* v. 1. 553. *Dryand*, in *Ait. Hort. Kew.* v. 1. 321.—Class and order, *Pentandria Monogynia*. *Nat. Ord. Ericæ*, Juss. *Epariideæ*, *Brown*.

Gen. Ch. Perianth inferior, of one leaf, chaffy, coloured, in five deep, equal, lanceolate segments, erect after flowering, permanent, accompanied at the base by two, or more, imbricated scales. *Cor.* of one petal, wheel-shaped, in five very deep, linear-lanceolate, equal segments, nearly as long as the calyx, each of them bearded at the base. Nectary of five scales, below the germen, sometimes combined. *Stam.* Filaments five, inserted into the receptacle, linear, hairy, shorter than the corolla; anthers vertical, oblong, distinct. *Pist.* Germen superior, roundish; style simple, cylindrical, about as long as the stamens; stigma obtuse, crenate. *Peric.*

Capule oblong, with five furrows, five valves, and five cells, the partitions longitudinal, from the centre of each valve. *Seeds* several, small, erect, inserted into the angles of the short central column.

Eff. Ch. Calyx in five deep segments, permanent, coloured, with two or more imbricated scales at the base. Corolla wheel-shaped, the length of the calyx; segments bearded at the base. Stamens inserted into the receptacle. Anthers unconnected. Nectary of five scales at the base of the germen. Capule of five valves and five cells, the partitions from the middle of each valve.

This genus consists of small shrubs, with squarrose, half-sheathing leaves, no annular scars remaining on the denudated branches. Flowers terminal, either spiked or solitary, erect. Receptacles from the bottom of the capule, short. *Seeds* but few brought to maturity. *Brown*.

In habit, as well as in the general structure of the fructification, nothing can be more absolutely like our *SPRENGELIA* (see that article); inasmuch that no person could, at first sight, form any idea of a difference between the two genera. (See also *PONCELETIA*.) The presence of scales at the base of the calyx, so unlike it as to be more properly termed, with Mr. Brown, *bractæas*, but in that case not entitled to enter into the generic character; the five nectiferous scales, wanting in *Sprengelia*; and the bearded base of the segments of the corolla; these are the distinctive marks of *Andersonia*. Similar differences serve to subdivide the original genera of *EPACRIS* and *STYPHELIA* (see those articles); but, as it seems to us, the genera thence derived are better defined, and accompanied with some distinctions in habit. In the present instance, with the greatest deference to the acute and learned author of *Andersonia*, we should be inclined to reduce to one genus, under one essential character, plants so strikingly alike, and so different from all others. *Genus dabit characterem*. One thing is certain, that we are in no danger of being suspected of wishing, by this means, to get rid of the name *Andersonia*, though *Sprengelia*, having been long previously established, must be preferred to it. Its character indeed must be reformed, because we were originally acquainted with but one species, the only one, it seems, whose anthers are connected. Such is the case with some species of *Gentiana*, but not with all. The following are Mr. Brown's six species of *Andersonia*, ranged in two sections.

SECT. 1. *Flowers with two scales, spiked.*

1. *A. sprengelioides*. Spreading-leaved *Andersonia*. *Br. n. 1.* *Ait. n. 1.*—Leaves spreading; with a flat point. Flowers spiked.—Found by Mr. Menzies, at King George's sound, on the south-west coast of New Holland. Sent to Kew, by Mr. Good, in 1803. It is said to flower most part of the year, being treated as a green-house plant. We received specimens from Messrs. Lee and Kennedy's green-house in 1814, but this little shrub is far from being generally cultivated, nor has it yet been figured. The stem is a foot or more in height, determinately branched, round, rigid, smooth, all the branches covered with numerous, rigid, glaucous, sessile, smooth, ovate, spinous-pointed, entire leaves; roughish at the edges; clasping the stem at their base; each about a quarter of an inch long, permanent. Flowers pale rose-coloured, scentless, in dense, short, leafy, terminal, upright spikes, not separately stalked, or racemose, as in *Sprengelia incarnata*, but otherwise very nearly resembling, in size and colour, the elegant blossoms of that plant.

2. *A. parvifolia*. Small-leaved *Andersonia*. *Br. n. 2.*—“Leaves close-pressed; with a triangular point.”—Discovered by Mr. Brown, on the southern coast of New Holland. We have not seen this species. The spinous point of each

each leaf is somewhat triangular in the former, though with an obtuse keel.

SECT. 2. *Flowers with many scales, solitary at the ends of small branches.*

3. *A. cerulea*. Blue *Anderfonia*. Br. n. 3.—“Leaves moderately spreading; by the younger ones, as well as the calyx, externally downy.”—Found by Mr. Brown, in the same part of New Holland as the last.

4. *A. squarrosa*. Squarrose *Anderfonia*. Br. n. 4.—“Leaves prominent, divaricated and recurved, smooth; naked at the edges. Calyx and style smooth. Stem erect.”—Native of the same country, where it was gathered by Mr. Brown. We have not seen this, nor either of the two preceding.

5. *A. depressa*. Procumbent *Anderfonia*. Br. n. 5.—Leaves prominent, divaricated, twisted and recurved, downy; fringed at the edges. Calyx smooth. Style hairy in the middle. Stem depressed.—Gathered at King George's sound, on the south-west coast of New Holland, by Mr. Archibald Menzies, to whom we are obliged for specimens. Mr. Brown also met with this species in the same country. The root is long and tapering. Stem hardly a span long, much branched, for the most part in an alternate manner, thickly covered with imbricated, spreading, rigid, minutely pungent, lanceolate, variously twisted and projecting leaves; smooth and somewhat glaucous on both sides; dilated at the lower part, where especially the edges are fringed. Flowers larger than in the first species, sessile at the ends of the little lateral leafy branches, solitary, apparently flesh-coloured. Corolla densely clothed internally with long white hairs. Style just perceptibly hairy about the middle.

6. *A. micrantha*. Small-flowered *Anderfonia*. Br. n. 6.—“Leaves close-pressed. Style downy below the middle.”—Found in the same part of New Holland as the rest, by Mr. Brown. We have seen no specimen.

ANDERTON, in *Geography*, a township of Ohio, in the county of Hamilton, having 1358 inhabitants.—Also, a township of East Tennessee, having 3959 inhabitants, of whom 260 are slaves.

ANDOVER, 2d article, l. 3, r. 3164; 3d article, l. 2, r. 1259; 4th article, l. 3, r. 957.

ANDOVER, *Eaß*, a township of Maine, in the county of Oxford, having 264 inhabitants.

ANDRÆA, in *Botany*, a very curious and distinct genus of Mosses, is thus named by Ehrhart, in honour of his friend JOHN GERHARD REINHARD ANDRÆ. (See that article.) This genus was intended to have been inserted by its author into the *Supplementum* of Linnæus, with the printing of which he was entrusted. (See LINNÆUS, or VON LINNÆ, CHARLES.) Such was the case with many others, belonging to the same natural order, and now well-established, though the younger Linnæus then forbade their admission into his book. Ehrhart called it *Andræa*, but the above orthography is justified by many similar examples among learned botanists.—Ehrh. *Hannov. Mag.* for 1778, 1601. *Bic-träge* v. 1. 15 and 180. *Hedw. Sp. Mufc.* 47. *Turn. Mufc. Hib.* 13. *Sm. Fl. Brit.* 1178. *Comp. ed.* 3. 153. *Hooker Tr. of Linn. Soc.* v. 10. 381. *Mufc. Brit.* 1. t. 1. —Class and order, *Cryptogamia Mufci*. *Nat. Ord. Mufci*.

Gen. Ch. Male, terminal, bud-like. *Anth.* three to seven, nearly cylindrical, somewhat stalked, interperfed with numerous, jointed, succulent threads, swelling upwards, taller than themselves.

Female, terminal, sessile. *Sheath* of several imbricated concave scales, shorter than the *fruit-stalk*, which is cylindrical, scarcely longer than the capsule, tumid at its base. *Peric.*

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Capsule on a turbinate fleshy base, ovate or cylindrical, somewhat quadrangular, of four equal oblong valves, separating longitudinally, cohering at their points, under the permanent lid: column cylindrical, about as long as the valves: lid minute, conical, permanent, confining the points of the valves. Veil membranous, pellucid, bell-shaped, torn irregularly from its base, and finally turned to one side, crowned with the slightly prominent style. Seeds minute, spherical, brown.

Elf. Ch. Capsule of four valves, cohering at the summit, crowned by the permanent lid. Veil irregularly torn.

Ehrhart first removed this genus from *Jungermannia*, with which it had been confounded, and properly referred it to the order of *Mufci*. But he mistook, as he well might, the valves of the capsule for its fringe or teeth; an error first corrected by Mr. W. Hooker, who, in the *Transf.* of the Linn. Soc., has first given a just and clear view of the subject. In his *Muscologia Britannica* the same author remarks, that the supposed *fruit-stalk*, as he himself had heretofore called it, is merely an elongated receptacle, bearing some abortive *pisillia*. This is certainly true, but we conceive it nevertheless to be analogous to the more extended *fruit-stalk* of the generality of Mosses, truly wanting in *Sphagnum*. All the known species of *Andræa* are British, and amount to four.

1. *A. alpina*. Chocolate Alpine *Andræa*. *Hedw. Sp. Mufc.* 49. *Fl. Brit. n. 2.* *Engl. Bot. t.* 1278. *Turn. Mufc. Hib.* 13. *Hook. Tr. of Linn. Soc.* v. 10. 388. t. 31. f. 1. *Mufc. Brit. n. 1.* t. 8. (*A. petrophila*; *Ehrh. Beitr.* v. 1. 192. *Crypt. 67.* *Roth Germ. v.* 3. 359. *Jungermannia alpina*; *Linn. Sp. Pl.* 1601. *Fl. Dan. t.* 1002. f. 1. *Lichenastrum alpinum atro-rubens* *terres*, *calycibus squamosis*; *Dill. Mufc.* 506. t. 73. (not 83.) f. 39.)—Stems branched. Leaves obovate, obtuse with a small point, concave, ribbed, imbricated every way.—Found in the crevices of alpine rocks, in Ireland, Wales, and Scotland, but, according to Mr. Hooker, not common. Ehrhart gathered it likewise in Sweden and Germany. The numerous stems form little dense tufts, usually of a very dark chocolate brown, but varying somewhat in hue, as well as in density. The minute leaves are concave, straight, neither keeled nor falcate, nor turned to one side. Capsule elliptic-oblong, on a paler base, raised on its white fleshy *fruit-stalk* a little above the numerous scales of the sheath.

2. *A. rupestris*. Dusky Rock *Andræa*. *Hedw. Sp. Mufc.* 47. t. 7. f. 2. *Engl. Bot. t.* 1277. *Hook. Tr. of Linn. Soc.* v. 10. 391. t. 31. f. 2. *Mufc. Brit. n. 2.* t. 8. (*Jungermannia rupestris*; *Linn. Sp. Pl.* 1601, excluding the synonym of Dillenius.)—Stems branched. Leaves ovate, taper-pointed, ribbed; upper ones falcate.—On rocky mountains throughout Great Britain. *Hooker*. Smaller and greener than the former, with which it agrees in the want of a mid-rib; but differs from it in the tapering, more or less curved, leaves. All botanists confounded this species with the following, till Dr. Roth distinguished them chiefly by the presence of the mid-rib in that species.

3. *A. Rothii*. Black Mountain *Andræa*. *Mohr Crypt. Germ.* 385. t. 11. f. 7—9. *Hooker Tr. of Linn. Soc.* v. 10. 393. t. 31. f. 3. *Mufc. Brit. n. 3.* t. 8. *Engl. Bot. t.* 2162. (*A. rupestris*; *Fl. Brit. n. 1.* *Turn. Mufc. Hib.* 14. *Lichenastrum alpinum nigricans*, *foliis capillaceis reflexis*; *Dill. Mufc.* 507. t. 73. (not 83.) f. 40.)—Stems slightly branched. Leaves lanceolate, keeled, curved to one side, single-ribbed. Scales of the sheath without a rib.—This, according to Mr. Hooker, is common on alpine rocks. We have often gathered it in dry exposed situations, in Westmoreland, as well as Scotland, where it composes little dense tufts, of a very dark or blackish hue. The same

is also found in Germany, and doubtless in other mountainous parts of Europe. Like both the foregoing, it bears *capsules* in the spring and summer. The presence of a strong rib in the *leaves* clearly distinguishes it from those species, though the paler, blunt, and more oblong, scales of the *sheath* have no rib. The *stems*, generally almost simple, are occasionally much branched, as in *Engl. Bot.*

4. *A. nivalis*. Tall Slender Andraea. Hook. Tr. of Linn. Soc. v. 10. 395. t. 31. f. 4. Musc. Brit. n. 4. t. 8. Engl. Bot. t. 2334. (not 2507).—Stems branched. Leaves loosely imbricated, lanceolate, single-ribbed, curved towards one side. Scales of the sheath similar.—Gathered by Mr. Hooker and Mr. Borrer, on rocks upon the highest summit of the Scottish mountain Ben Nevis, at the eastern end. It is, like all the rest, perennial, bearing *capsules* in summer.

This is by far the tallest *Andraea* known, being three inches high, or more, forming rather lax olive-brown tufts, tinged with a chocolate-colour, of which last hue are the *capsules*, whose substance is strongly reticulated. The scales of the *sheath* being of the same lanceolate figure, furnished with a mid-rib, as the *leaves*, clearly defines the species. Mr. Hooker has observed this moss on the granite rocks of the most elevated of the Swiss alps, retaining all the characters of the Scottish specimens.

ANDREW, *Knights of*, &c. l. 12, r. Favin; col. 2, l. 28, r. commissioner; l. 29, r. little for litter.

ANDROMACHA, l. 1, r. Zygæna.

ANDRONICUS II., PALÆOLOGUS, in *Biography*, son of Michael Palæologus, succeeded to the Greek empire in 1283. He is characterized as learned and virtuous, but feeble in his conduct, and abjectly superstitious. His old age was embittered by blindness and neglect; and having assumed the name of Father Antony, he closed his unquiet life four years after his abdication, A.D. 1332, aged 74.

ANDRONICUS III., *Palæologus*, the younger, was the son of Michael, eldest son and colleague of the elder Andronicus. With his grandfather he was a favourite, on account of his wit and beauty; and he was thus led into habits of intemperance and debauchery, which involved him in difficulties and disgrace. Having compelled his grandfather to abdicate in 1328, he reigned alone, and contended against the Bulgarians and Turks, with the latter of whom he signed an ignominious treaty, relinquishing to them all the places which they had taken in Asia. At length, exhausted by his vices, he died in his 45th year, A.D. 1341. Gibbon.

ANDROPHYLAX, in *Botany*. See WENDLANDIA.

ANEILEMA, from α , *without*, and $\epsilon\lambda\eta\mu\alpha$, *an involucre*, this genus being separated by Mr. Brown, Prodr. Nov. Holl. v. 1. 270, from *COMMELINA*, (see that article,) on account of the want of the large folded *involucre*, or rather *bractea*, which in *Commelina* contains a considerable number of flowers; whereas in *Anilema* the inflorescence is scattered, somewhat panicled. The difference between the two resides therefore in this part of the plant, and not strictly in the fructification.

The known species of *Commelina* referred by Mr. Brown to *Anilema* are, *vaginata*, *nudiflora*, and *spirata* of Linnæus; *medica* of Loureiro, Vahl Enum. v. 2. 175. n. 28; and *gigantea* of Vahl, n. 34, found by Mr. Brown, in the tropical part of New Holland. To these the author adds nine new species, found by himself, either in New South Wales, or the warmer parts of New Holland, one of them only being described from the collection made in the latter country by Sir Joseph Banks. Some have smooth *filaments*, others bearded ones. It is suspected that *Pollia* of Thunberg may not be generically distinct from these; but the *fruit* in our specimen is evidently a *berry*, according to Thunberg's de-

scription, and remarkable, even after having been dried more than thirty years, for its bright blue colour. (See POLLIA.) The habit and inflorescence are indeed, as Mr. Brown observes, similar to his *Anilema*. Whether *Cartonema* of this author be distinct, we do not presume to judge, having seen no specimen. In the regularity of its *flowers*, and the equality of their *filaments*, it differs from *Commelina* and *Anilema*, and agrees with *Tradejantia*, but differs from the latter in several particulars pointed out by Mr. Brown, besides its spiked inflorescence.

ANEMIA, a genus of ferns, separated from *OSMUNDA*, (see that article,) by Dr. Swartz, and thus named from $\alpha\nu\epsilon\mu\omega\varsigma$, *naked*, or *not covered*; because its capsules are destitute of all covering or *involucrum* whatever.—Swartz Syn. Fil. 155. Willd. Sp. Pl. v. 5. 89. Ait. Hort. Kew. v. 5. 498.—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices*, sect. 2, *spuriæ gyrate*.

Eff. Ch. Capsules somewhat turbinate, concentrically striated at the top, burbling laterally, sessile on one side of a compound linear receptacle. *Involucrum* none.

The habit of this genus is different from *Osmunda*, and extremely remarkable, on account of its compound spikes, always perfectly distinct from the leafy part of the frond, and generally situated in pairs, on long stalks, on the common stalk at the base of that leafy part. Such at least is the case with the whole of the first section; in the second, the fruit-bearing stalks are radical and solitary. It is closely related to *BOTRYCHIUM*, to be described hereafter; but that has globular capsules of two distinct valves, neither striated nor annulated. Their receptacles, indeed, exactly agree; and the striæ are so obscure in *Anemia*, that we are much inclined to unite it with *Botrychium*.

SECT. 1. *Panicles of spikes in pairs, stalked, at the base of the leaf.*

1. *A. phyllitidis*. Broad-leaved Anemia. Swartz n. 1. Willd. n. 1. (*Osmunda phyllitidis*; Linn. Sp. Pl. 1520. *O. lanceolata* et *subtiliter serrata*; Plum. Fil. 133. t. 156. *O. racemifera*, *phyllitidis folio vix crenato*; Petiv. Fil. n. 163. t. 8. f. 15).—Frond pinnate; leaflets ovato-lanceolate, pointed, finely serrated, smooth as well as the common stalk.—Native of South America and the West Indies. Brought from Brazil, by the late Sir George Leonard Staunton, in 1793. A very handsome fern, eighteen inches or two feet high, its tufted *root* producing several upright *fronds*. Each of these consists of a smooth, rather slender, straight *common stalk*, bearing at the top an upright simply pinnate *leaf*, of from four to eight pair of smooth, veiny, bluntly serrated, somewhat stalked, *leaflets*, besides an odd one; their length from two to four inches. Close to the base of this pinnate leaf, on the upper side, or front, are stationed a pair of equal, long-stalked, triply pinnate *spikes*, of minute, pale, very numerous, *capsules*, ranged in double rows along one side of the linear compound stalk, or *receptacle*, the *common stalk* of the whole being somewhat hairy. These compound *spikes* always rise a little above the point of the terminal *leaflet*.

2. *A. hirta*. Rough-leaved Anemia. Swartz n. 2. Willd. n. 2. (*Osmunda hirta*; Linn. Sp. Pl. 1520. *O. hirsuta*, *lonchitidis folio*; Plum. Fil. 134. t. 157. *O. spicis geminis*; Petiv. Fil. n. 164. t. 14. f. 5. *Lonchitis hirsuta florida*; Plum. Amer. 18. t. 26).—Frond pinnate; leaflets oblong-lanceolate, hairy, finely serrated, and somewhat cut; very unequal at the base. Stalks all hairy.—Native of the West Indies. Smaller in every part than the last, being scarcely above a foot high; and distinguished also by the great dilatation of the upper side of each *leaflet*, at its base. The upper ones run into a sort of pinnatifid elongated point.

ANEMIA.

point. Both sides of the *leaflets* are hairy in our specimen, as Plumier describes them; though Willdenow and Swartz call them smooth. The dense, twin, hairy, twice-compound *spikes* usually rise a little above the leaf.

3. *A. blechnoides*. Many-leaved Anemia. — Frond pinnate, longer than the *spikes*; leaflets numerous, parallel, oblong, obtuse, serrated, smooth; rectangular on their upper side at the base. — Brought from Brasil, by the late Sir George Leonard Staunton, from whom we received specimens in 1793. We cannot find any figure or description of this species, though a very remarkable one. The *common stalk*, in its naked part, is smooth. The *leaflets* are about forty pair, parallel and crowded; the lowermost an inch and a quarter long, and opposite; upper ones gradually smaller and alternate; all together forming a linear-oblong frond, eighteen inches in length, with a slightly hairy *common rib*, which, by a hairy bud at the summit, seems as if it would take root there. *Spikes* lax, twice compound, measuring with their slightly hairy stalks, about two-thirds of the length of the leafy part. Their subdivisions are extremely narrow.

4. *A. oblongifolia*. Oblong-leaved Anemia. Swartz n. 3. Willd. n. 3. (*Osmunda oblongifolia*; Cavan. Ic. v. 6. 69. t. 592. f. 2.) — Frond pinnate; leaflets obovate, obtuse, dilated at the upper angle of their base, fringed. Stalks smooth. — Gathered by Louis Née at Panama. Several stalked fronds, hardly six inches high, spring from the hairy crown of the tufted root; some of them barren. The *leaflets* of each are about ten pair, rather alternate than opposite, half an inch long, rounded at their extremity, as well as at the dilated angle. Both *spikes* rise much higher than the leafy part, on slender stalks, and appear to be rather dense. We know this and the following from the work of Cavanilles only.

5. *A. humilis*. Dwarf Anemia. Swartz n. 4. Willd. n. 4. (*Osmunda humilis*; Cavan. Ic. v. 6. 69. t. 592. f. 3.) — Frond pinnate; leaflets obovate-wedge-shaped, abrupt; crenate at the extremity; hairy beneath. Common stalk hairy. — Native of Tabago, an island on the Mexican coast, near Panama. Of more humble stature than the last, and further distinguished by the wedge-like shape of its *leaflets*, which are fewer, rather larger, crenate, and not fringed. The *spikes* are much smaller than in the foregoing, raised high upon slender smooth stalks.

6. *A. filiformis*. Slender Hoary Anemia. Swartz n. 5. Willd. n. 5. (*Osmunda filiformis*; Lamarck Dict. v. 4. 652.) — Frond pinnate, downy and hoary; leaflets oblong-wedge-shaped, obtuse; jagged at the extremity. Common stalk hairy. — Gathered in South America by Mr. John Frazer, who is reported to have communicated a specimen to Lamarck. We have never seen this plant. It is described as eight or nine inches high, besprinkled in every part with white or hoary hairs. *Leaflets* striated very copiously and conspicuously beneath. *Spikes* slender, compound, on capillary stalks, rising high above the leaf. *Savigny* in Lamarck.

7. *A. tenella*. Delicate Anemia. Swartz n. 6. Willd. n. 6. (*Osmunda tenella*; Cavan. Ic. v. 6. 69. t. 592. f. 1.) — Frond pinnate; leaflets lanceolate, deeply pinnatifid, with linear-awl-shaped fringed segments. Common stalk smooth. — Found by Louis Née, on the trunks of trees in Quito, especially on mount St. Antonio. A slender delicate fern, about six inches high, whose *leaflets* have many fine, acute, partly opposite, segments. The *spikes* are somewhat taller than the leaf.

8. *A. hirsuta*. Hairy Anemia. Swartz n. 7. Willd.

n. 7. Ait. n. 1. (*Osmunda hirsuta*; Linn. Sp. Pl. 1520. O. molliter hirsuta, et profundè laciniata; Plum. Fil. 139. t. 162. O. spicis geminis villosa; Petiv. Fil. n. 165. t. 8. f. 16. Lunaria elatior, matricaria: folio, spicâ, duplici; Sloane Jam. v. 1. 71. t. 25. f. 6.) — Frond pinnate, hairy; leaflets deeply pinnatifid; segments tapering downwards; obtuse and jagged at the extremity. — Native of the West Indies, growing on rocks. About a foot high, hairy all over, except the *spikes* and their stalks. Several of the fronds are barren, which we presume is the case with most of the neighbouring species. Each *leaflet* is about an inch and a half long, with many narrow-wedge-shaped, deep, striated segments, hairy on both sides, and sharply notched. Each *spike*, near three inches long, is doubly pinnate, with flat close segments, broader than in most of the genus, and the *capsules* are represented by Plumier as marginal, and blackish, with much more intermediate space than usual on each segment. Willdenow adverts to this circumstance, and the hairiness of the common stalk, as indicating a specific difference between Plumier's plant and what he had examined. Specimens from the West Indies, and from Dr. Swartz, certainly agree with Sloane's plant, and like that, have a smooth common stalk; but having seen none answering to Plumier's, we decline attempting a specific definition, from his figure. He is, however, the original authority for *Anemia*, or *Osmunda*, *hirsuta*, and Petiver copies him; but Sloane's synonym must be referred to the new species, if such be established.

9. *A. deltoidea*. Triangular Anemia. Swartz n. 8. Willd. n. 8. (*Osmunda deltoidea*; Cavan. Ic. v. 6. 70. t. 593. f. 1.) — Frond triangular, pinnate; leaflets deeply pinnatifid, with rounded, crenate, crowded segments; glaucous above; hairy beneath. Common stalk hairy at the upper part. — Found on rocks in the plain of Buenos Ayres, by Louis Née. A span high, with broader and rounder segments of the *leaflets* than any of the foregoing. The divisions of the common receptacle of the *spike* also are broader, and more rounded, than usual, approaching to those in Plumier's plate of the last.

10. *A. villosa*. Shaggy Anemia. Willd. n. 9. — "Frond doubly pinnatifid, oblong, shaggy on both sides; segments roundish-ovate, obtuse, entire; the lower ones obscurely three-lobed. Common stalk shaggy." — Gathered by Humboldt and Bonpland in South America. *Common stalk* six inches high, or more, roundish, clothed with short rusty wool. *Frond* three or four inches long, covered with rusty hairs; the upper segments roundish-ovate, very blunt, and entire; lower with two or three slight lobes; *common rib* densely shaggy. *Spikes* triply compound, dense, taller than the leaf, with hairy ribs and stalks. Apparently akin to the following, but the outline of the frond is oblong, not triangular, and the rib straight, not zigzag. Willdenow.

11. *A. flexuosa*. Zigzag Anemia. Swartz n. 9. Willd. n. 10. (*Osmunda flexuosa*; Lamarck Dict. v. 4. 652.) — "Frond doubly pinnatifid, triangular, downy; segments oblong, obtuse, nearly entire; common rib zigzag. Common stalk downy." — Supposed to be a native of Peru, but for this there is no direct authority. We have seen no specimen. *Savigny* in Lamarck describes this species as related, in many respects, to *A. hirsuta*, n. 8, but the principal *leaflets* are simply pinnatifid. The stalks are about a foot high, semi-cylindrical, channelled, besprinkled with rather rigid, tawny hairs. *Fronds* from five to seven inches long, with narrow, deeply pinnatifid, *leaflets*; their segments oval, or somewhat oblong, nearly opposite, very blunt, decurrent, ribbed, entire, or slightly notched; paler beneath.

The summit of each *frond* is obtuse, and simply pinnatifid. *Spikes* triply and minutely compound, with linear short segments; their *stalks* hispid.

12. *A. tomentosa*. Downy Anemia. Swartz n. 10. Willd. n. 11. (*Osmunda tomentosa*; Lamarck Dict. v. 4. 652.)—*Frond* doubly pinnate, oblong, clothed with tawny down; leaflets crescent-shaped, entire; the lower ones bluntly pinnatifid. Common *stalk* downy.—Found by Commerçon at Buenos Ayres. A pretty species, seven or eight inches high, exhaling the smell of myrrh, and covered all over with fine, long, cottony, tawny down. The common *stalk* is rather stout, twice the length of the leafy part, which is about two inches broad. *Spikes* compound, on slender decurrent *stalks*. Savigny.

13. *A. fulva*. Tawny Branching Anemia. Swartz n. 11. Willd. n. 12. (*Osmunda fulva*; Cavan. Ic. v. 6. 70. t. 593. f. 2.)—*Frond* doubly pinnate, triangular, somewhat downy; leaflets elliptic-oblong, bluntly pinnatifid, or serrated. Spikelets partly whorled. All the *stalks* hairy.—Gathered by Louis Néé, on the hill called *Pan de Azucar*, or the Sugar-loaf, thirty-two miles from Monte Video. Above a foot high, with very hairy *stalks*, and a broad *frond*, doubly pinnate throughout, except at the very top. *Leaflets* three-quarters of an inch long, and one-third as broad, uniform, somewhat decurrent. The *spikes* seem to be simply compound, their *branches* horizontal, linear, deeply notched, many of them in whorls of three or four together; their common *stalks* and *ribs* hairy, sending off one or three lateral branches, which we have seen in no other species.

14. *A. adiantifolia*. Maiden-hair-leaved Anemia. Swartz n. 13. Willd. n. 13. Ait. n. 2. (*Osmunda adiantifolia*; Linn. Sp. Pl. 1520. *O. filiculae folio major*; Plum. Fil. 135. t. 158. *O. adiantii nigri facie*; Petiv. Fil. n. 167. t. 9. f. 1. *Adiantum faxofolium floridum*; Plum. Amer. 29. t. 43.)

β. Willd. (*A. asplenifolia*; Swartz n. 10. *Osmunda asplenifolia*; Savigny in Lamarck Dict. v. 4. 652.)

Frond doubly or triply pinnate, triangular; leaflets obovate, sharply toothed at the end, partly notched, hairy, as well as their common rib. Common *stalk* nearly smooth. Spikelets digitate.—Native of the West Indies, particularly of Hispaniola, in dry rocky or stony places. Its large handsome, shining, striated *frond* bears considerable resemblance to our common *Asplenium Adiantum-nigrum*, to which, and not to the real genus *Adiantum*, the specific name alludes. The naked *stalk* is often a foot high; the length of the leafy part almost as much. The copious *leaflets* measure about half an inch, and are strongly striated; convex above; paler, and rather most hairy, beneath; all their *stalks* hairy. *Spikes* somewhat panicled; their ultimate divisions radiating, or finger-like, linear, flat. *Capsules* of a light shining brown.

Sir Joseph Banks has favoured us with several specimens of a variety of this fern, gathered at Campechy by Houftoun, which differs chiefly in being not above a span high, with a less compound *frond*, and having sometimes, from the same root, much narrower, almost linear, *leaflets*. The common *stalks* are also rather more hairy, and the *spikes* more compact. It is nevertheless an evident variety, and probably the β of Willdenow, to the characters of which it answers.

SECT. 2. *Panicles of spikes on radical stalks*.

15. *A. bipinnata*. Great Radical Anemia. Swartz n. 14. Willd. n. 14. (*Osmunda bipinnata*; Linn. Sp. Pl. 1521. *O. latis crenis incisa*; Plum. Fil. 133. t. 155.)—*Frond* oblong, doubly pinnate; leaflets elliptical, acute, entire. *Spikes* on radical *stalks*, doubly pinnate; their ultimate seg-

ments densely crowded.—Gathered by Plumier in a dry stony tract of land in Hispaniola. We find no good authority for its having ever been found elsewhere, nor by any other botanist. Linnæus adopted this species entirely from Plumier, between whose figure and description there is a strange contrariety. The plate, drawn and engraved by himself, evidently exhibits the barren *fronds* as doubly pinnate, each of the numerous primary divisions being composed of a rather smaller number, (about thirty,) of oval or ovate, somewhat decurrent *leaflets*, except a few of the uppermost, which run into a terminal ferrated point. His description says, "the tufted root bears seven or eight ribs, about a foot and a half long, garnished nearly throughout their whole length, with longish, narrow, pointed, yellowish-green leaves, but slightly furrowed, and all cut into rather broad, and somewhat pointed notches." As the author is known to have lost many of his specimens, we can only suppose this description was made from too slight a view of his own drawing, without a re-examination of the plant, which he seems to have gathered but once. A few taller and more slender *stalks*, springing also from the root, and doubly pinnate in the first instance, bear innumerable *capsules* crowded into dense masses, which we presume to be composed of narrow compound segments, like the other species. At least the analogy of *A. filiculifolia* hereafter described justifies this supposition.

16. *A. aurita*. Auricled Radical Anemia. Swartz n. 15. Willd. n. 15. (*Osmunda aurita*; Swartz Ind. Occ. 1578.)—"Frond pinnate; upper leaflets simple, ovate, obtuse, finely toothed, unequally wedge-shaped at the base; lower ternate. Spikes compound, on radical *stalks*; spikelets digitate."—Found by Dr. Swartz, on the sides of lime-stone rocks, in the interior part of Jamaica. *Roots* creeping, slender. Common *stalks* several, crowded, about a span high, slender, most hairy and scaly at the base; downy and roughish upwards. Each bears an erect *frond*, six inches in length; doubly pinnate in its lower part, the *leaflets* small, roundish, the terminal ones larger and rhomboidal: the upper part is simply pinnate; *leaflets* oblong, oblique at the back, dilated on the upper edge, at the base, into an obtuse angle: all the *leaflets* are coriaceous, smooth and shining, slightly convex, streaked with radiating veins; finely crenate at the margin; more opaque beneath. *Clusters*, (or rather *spikes*,) compound, on radical *stalks*, close to, and resembling, those of the barren *fronds*; their branches compound, nearly opposite, spreading; their ultimate segments digitate, lanceolate, acute, bearing on the upper side roundish-ovate bivalve *capsules*, with concentric streaks on their apex, and interperfed with minute scales or hairs. Swartz. By this description, the genus is put out of all doubt.

17. *A. verticillata*. Whorled Radical Anemia. Swartz n. 16. Willd. n. 16. (*Osmunda verticillata*; Linn. Sp. Pl. 1520. Plum. Fil. 137. t. 160. Petiv. Fil. n. 171. t. 12. f. 4.)—*Frond* three-branched, triply pinnate; leaflets elliptic-oblong, acute, serrated; terminal ones lanceolate, pointed. Spikes in whorled branches, on radical *stalks*.—Gathered once only, in the forests of Hispaniola, by Plumier, nor does it appear that any other botanist has even seen this species, his work having been Linnæus's sole authority. The genus, therefore, can only be presumed from analogy, but we think this analogy as fair as in any similar instance. The tufted root sends up many barren *fronds*, which are supported by long rough *stalks*, and three-cleft in the first instance, then doubly pinnate; their common outline pentagonal, a foot in diameter; their *leaflets* usually

near an inch long. The height of each *frond*, with its *stalk*, is about two feet. A few rather more slender *stalks*, from the root, bear each a long interrupted, whorled *spike*, with six or eight drooping, obtuse, dense, blackish *branches*, in every whorl, above an inch long, on capillary stalks, but how they are subdivided we have no information. Plumier compares them to little black caterpillars.

18. *A. filiculifolia*. Hemlock-leaved Radical Anemia. Swartz n. 17. Willd. n. 17. (*Osmunda filiculifolia*; Linn. Sp. Pl. 1521. *O. filicula folio altera*; Plum. Fil. 138. t. 161. *O. cicutae folio*; Petiv. Fil. n. 170. t. 9. f. 3.)—*Fron*d three-branched, pinnate, pinnatifid; segments wedge-shaped, decurrent; notched at the extremity. Spikes panicled, on radical stalks.—Found but rarely by Plumier, in the forests of Hispaniola. A specimen, without any indication from whence it came, is preserved in the Linnean herbarium, and referred to *Osmunda (Anemia) bipinnata*, (see n. 15.) Linnæus appears to have had it when he wrote the first edition of Sp. Pl., but all he says of either of these species is entirely taken from Plumier, who is the primary authority for both. *A. filiculifolia* varies from five inches to above a foot in height. The barren *fronds* have slender, roughish, rather long, *stalks*, and are nearly pentagonal in their outline; having three principal branches, which are first pinnate, then more or less deeply pinnatifid and cut, always in a wedge-like manner; they are hairy on both sides. The common *mid-rib* is winged. From the same tufted *root* grow one or more rather taller *stalks*, each bearing a triply-compound, slightly hairy, *panicle*, or compound *spike*, whose linear ultimate segments are laden, on one side, with rather large, and not very numerous, *capsules*, each having a very distinct, brown, shining, radiated top, below which is a lateral fissure. The engraving of Plumier gives no idea of the size or nature of these *capsules*, nor of their arrangement, so that we may suppose him equally incorrect with regard to our fifteenth or seventeenth species.

Dr. Swartz, Syn. Fil. 158, points out, as a probable species of this genus, *Filicium americanum minus, foliis ramosis hirsutis*, Ammann in Comment. Petrop. v. 10. 295. t. 19. This was found by Dr. Houttoun at Vera Cruz, and however unlike the figure may seem to Plumier's t. 161, our specimen mentioned, and partly described, under the last species, serves to prove them, at least in our opinion, one and the same plant; for it explains the inaccuracies of both figures, and is intermediate between the two in the structure of the barren *frond*. We cannot doubt its being one of Houttoun's specimens. The panicled *inflorescence* agrees with Ammann's figure, but the detail of that figure is no less incorrect than Plumier's, so that nothing precise can be gathered from either.

ANEMOMETER, col. 2, for IX. insert VIII. No. 3. ANEMONE, in *Botany*, has received to much improvement and illustration from the pen of professor De Candolle, that our former article is by no means sufficient to give a complete, or an accurate, idea of this genus. Linnæus indeed had but an imperfect acquaintance with its species, nor do all authors agree with him as to its generic limits. M. De Candolle however excludes HEPATICA only. (See that article hereafter.) His view of the subject cannot but prove instructive and interesting.—De Cand. Syst. v. 1. 188. Linn. Gen. 279. Schreb. 375. Willd. Sp. Pl. v. 2. 1272. Mart. Mill. Dict. v. 1. Sm. Fl. Brit. 580. Prodr. Fl. Græc. Sibth. v. 1. 374. Ait. Hort. Kew. v. 3. 336. Pursh 386. Juss. 232. Tourn. t. 147. Lamarck Illustr. t. 456. Gærtn. t. 74.—Clafs and order, *Polyandria Polygynia*. Nat. Ord. *Multifloræ*, Linn. *Ranunculaceæ*, Juss. De Cand.

Gen. Ch. *Cal.* none, except a three-leaved, variously

cut, involucrem. *Cor.* Petals from five to fifteen, ovate or oblong. *Stam.* Filaments numerous, capillary, not half the length of the corolla; anthers two-lobed, erect. *Pist.* Germens numerous, collected into a head, single-feeded; styles tapering; stigmas blunt. *Peric.* none. *Recept.* globose or oblong, covered with small excavations. *Seeds* numerous, crowded, roundish, pointed with the permanent style, which in some is lengthened out into a feathery tail.

Eff. Ch. Involucrem three-leaved, cut. Petals from five to fifteen. Seeds numerous, capitate.

This genus consists of perennial herbs. *Roots* (or perhaps subterraneous *stems*?) either tuberous, or horizontally creeping, or simply fibrous. *Leaves* radical, stalked, simple (or compound), lobed or cut. *Flower-stalk* radical, bearing at the summit an *involucrem* of three, rarely but two, leaves, variously cut, but conformable in general to the proper foliage. From this *involucrem* proceeds usually one or many simple, naked, single-flowered *stalks*; some apparently caulescent species have one such leafless *stalk*, and, besides, a fort of branch, bearing another *flower-stalk*, accompanied by a two-leaved *involucrem*. The *flowers* are inodorous, very variable, and readily become double.

The recent plants are acrid, and raise blisters in the skin, if applied externally: internally they are poisonous in some degree, though several have been prescribed in chronic ophthalmia, and venereal caries of the bones.

The forty-five species, with which we are at present acquainted, inhabit pastures, hills, woods or thickets, of temperate climates, principally in the northern hemisphere; the *Pulsatilla* are found on rough exposed hilly fields; *Preonanthus* on the loftiest mountains; *Pulsatilla* at the Cape of Good Hope; *Anemonanthea* in meadows, pastures, or woods; *Anemonepermis* in North and South America and in Asia; *Omalocharis* in mountainous situations. There are two species from the Cape of Good Hope, four from South America, eleven from North America, seventeen are natives of Europe, three of the Levant, five of Siberia, two of Nepal, and one of Japan. Four appear to be common to North America and Europe.

Anemone is a very natural genus, and De Candolle declares his opinion against subdividing it; first, because the section *Preonanthus* has the habit and flower of the *Anemonantheæ*, with the feathery-tailed fruit of *Pulsatilla*; secondly, because the fruit being furnished with such an appendage, or destitute of it, is not to be considered essential in the present case, the same circumstance proving of no avail in the genus *Clematis*, so nearly related to the present.

The following divisions, founded on the whole habit as well as the fruit, prove extremely natural.

SECT. 1. *Pulsatilla*. Seeds terminating in long, bearded tails. Involucral leaves feffile, deeply palmate, with linear lobes. Species 1—7.

2. *Preonanthus*. Seeds terminating in long bearded tails. Involucral leaves stalked, in three segments. Species 8.

3. *Pulsatilloides*. Seeds very hairy. Petals fifteen to twenty. Involucral leaves two or three, feffile, cut at the summit. Species 9 and 10.

4. *Anemonanthea*. Seeds without tails, ovate. Partial flower-stalks solitary or in pairs, always leafless and single-flowered. Involucral leaves stalked. Species 11—32.

5. *Anemonepermis*. Seeds without tails, rather compressed. Partial flower-stalks several; one of them leafless and single-flowered; two or three others bearing a two-leaved partial involucrem. Species 33—40.

6. *Omalocharis*. Seeds compressed flat, orbicular, or slightly oval, smooth, without tails. Partial flower-stalks numerous, umbellate, leafless, single-flowered. Species 41—43.

† Species

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† Species not sufficiently known; 44 and 45.

We have corrected some accidental numerical errors, and we take the liberty of using the Linnæan terminology, as to *calyx* or *corolla*, here as in *Aconitum*, &c. *Carpella*, a word used by our learned friend for partial fruits, several of which belong to one flower, as in *Uvaria*, *Unona*, &c., seems to us well expressed, in English at least, by the plural, *fruits*; the singular, *fruit*, being always used when the pericarp is simple, or solitary. *Cariopsis* is used by Richard and De Candolle for the naked seed of Grasses, as well as of *Ranunculaceæ*, of which we do not see the utility. A multiplication of terms, without absolute necessity, is burthenome to science, and we rather wish the learned would labour to compress, instead of extending, the terminology of natural history.

§ Sect. 1. *Pulsatilla*. Bauh. Pin. 177. Tourn. t. 148.

Seeds terminating in long bearded tails. Involucral leaves sessile, dilated at the base, divided upwards, in a palmate manner, into linear segments. Petals five or six. Glands, (abortive stamens,) in several species, on short stalks, between the perfect stamens and petals. The radical leaves are mostly divided in a pinnate manner, their segments many-cleft, with linear or wedge-shaped lobes. *Flowers* in general purple or crimson.

1. *A. vernalis*. Parsley-leaved Spring Anemone. Linn. Sp. Pl. 759. Fl. Lapp. ed. 2. 189. De Cand. n. 1. Willd. n. 4. Ait. n. 3. Fl. Dan. t. 29. (A. n. 1147; Hall. Hist. v. 2. 61. t. 21. *Pulsatilla* altera alpina; Dalech. Hist. 851. *P. apii folio vernalis*, fl. majore, et fl. minore; Bauh. Pin. 177. Prodr. 94. "Helw. Pulf. 63. t. 9.")—Leaves pinnate; leaflets elliptic-wedge-shaped, notched or three-cleft, nearly smooth. Flower erect. Involucrum very hairy. Petals six, straight, elliptic-oblong.—Native of rocky pastures on the loftiest mountains of Switzerland, the Pyrenees, Germany, Sweden, and Norway, flowering among the melting snow in spring. The broad leaflets, with the beautifully silky involucrum and petals, distinguish this species. The *flower-stalk* is three or four inches high, hairy, much elongated above the involucrum after flowering, as in all the *Pulsatilla*-tribe. Flower white, variegated with purple, extremely elegant; we have some doubt whether the report of its being ever yellow be well founded, and whether the term "golden" in Dalechamp, copied by J. Bauhin, may not apply to the brilliant yellow pubescence of the living as well as dried flowers, noticed by Haller.

2. *A. Halleri*. Silvery Swifs Anemone. Allion. Pedem. v. 2. 170. t. 80. f. 2. De Cand. n. 2. Willd. n. 5. Villars Dauph. v. 3. 725. (A. n. 1148; Hall. Hist. v. 2. 62.)—Leaves pinnate, deeply cut, with linear-lanceolate, pointed segments; very hairy beneath. Flower erect. Petals six, straight, elliptic-lanceolate.—Native of the alps, flowering in summer. Haller gathered it in the valley of St. Nicholas, in the Upper Vallais; Villars in Dauphiny; Molineri on the Piedmontese mountains; De Candolle in the eastern Pyrenees. The leaflets and their segments are much longer and narrower than in the foregoing; pubescence of the flower and involucrum silvery, not yellow. Petals dull purple, converging, not spreading.

3. *A. cernua*. Drooping Japanese Anemone. Thunb. Jap. 238. De Cand. n. 3. Willd. n. 3.—"Leaves pinnate; shaggy and somewhat downy beneath; leaflets pinnatifid, with notched oblong segments. Flower rather drooping. Petals six, elliptic-oblong, spreading."—Native of Japan, about Jedo and Nagasaki, (Thunberg,) flowering in spring. All the stalks are very hairy, as are the leaves beneath, especially when young. The segments of the latter

are intermediate between *vernalis* and *Pulsatilla*. *Stalk* fix inches high. Flower dark purple, hairy externally, smaller than in *A. Pulsatilla*. De Candolle.

4. *A. patens*. Naked-flowering Anemone. Linn. Sp. Pl. 759. De Cand. n. 4. Willd. n. 2. Ait. n. 2. (*Pulsatilla* polyanthos violacea, anemones folio; Breyne. Cent. t. 61. "Helw. Pulf. 52. t. 2, 3.")—Leaves later than the flower; leaflets ternate, wedge-shaped, deeply and acutely pinnatifid and cut. Flower erect, spreading.—Native of Siberia, Poland, Silesia, &c.; recently found by Mr. Schleicher in Switzerland. The flowers are as large as any of this section, and more spreading, either pale yellow, white, or purplish, on a very short partial stalk; the involucrum in very narrow, linear, hairy segments. The leaves expand after the flower is past, and are ternate, not pinnate, with radiating, very acute, variously notched, segments. The partial stalk is greatly elongated, from six to nine inches, as the fruit ripens. De Cand.

5. *A. Pulsatilla*. Paque-flower Anemone. Linn. Sp. Pl. 759. De Cand. n. 5. Willd. n. 6. Fl. Brit. n. 1. Engl. Bot. t. 51. Fl. Dan. t. 153. Bull. Fr. t. 49. Ehrh. Pl. Off. n. 135. (*Pulsatilla*; Matth. Valgr. v. 1. 568. Dalech. Hist. 849. *P. vulgaris*; Lob. Ic. 281. Ger. Em. 385.)—Leaves doubly pinnate, cut, with linear segments. Flower somewhat drooping. Petals six, rather spreading, straight.—Found in wild open fields, and on dry hills, especially where the soil is chalky, throughout most parts of Europe, flowering in April or May. The finely divided, doubly or triply pinnate, leaves, whose segments are sometimes nearly awl-shaped, distinguish this from all the preceding. Its flower, usually of a dull purplish blue, is said to be occasionally red, greenish, or white, none of which variations have we noticed in England. The petals are an inch and a half long, finely downy at the back. Head of seeds large and hairy, raised on a tall stalk.

6. *A. pratensis*. Dark Meadow Anemone. Linn. Sp. Pl. 760. De Cand. n. 6. Willd. n. 7. Ait. n. 5. Fl. Dan. t. 611. Woodv. Med. Bot. t. 148. (Herba venti; Trag. Hist. 413. *Pulsatilla*; Camer. Epit. 392. *P. flore claufo*; Lob. Ic. 283. *P. flore minore*; Ger. Em. 386. *P. altera*; Dalech. Hist. 850.)—Leaves doubly or triply pinnate, with lanceolate, elongated segments. Flower pendulous. Petals six, erect; reflexed at the summit.—Native of meadows, as well as of dry open fields, in Sweden, Denmark, Russia, Germany, France, and, according to the abbé Seftini, near Constantinople with the preceding. This species is distinguished from *A. Pulsatilla*, by the larger coarser segments of its leaves, and smaller, darker-coloured flower, whose petals are recurved at the top. Dr. Storck recommended an extract or infusion of the herb, in chronic diseases of the eyes, and even confirmed lues. Hence it has attracted the notice of physicians, who have been commendably anxious to procure the true plant, which is not found wild in Britain. Probably its virtues, whatever they may be, exist likewise in the *A. Pulsatilla*. Both are easily cultivated.

7. *A. albana*. Pale Caucasian Anemone. "Steven Mem. Soc. Nat. Mofc. v. 3." De Cand. n. 6.* addend. 545.—Leaves doubly pinnate, with numerous oblong-linear segments. Flower drooping. Partial stalk scarcely longer than the involucrum. Petals six, erect, slightly reflexed at the summit.—Gathered by Mr. Steven, on the lofty mountains of the eastern part of Caucasus. Allied to *A. pratensis*, but differing first in the lobes of the leaves, and their subdivisions being shorter as well as more obtuse, rather oblong than truly linear; secondly, in the partial stalk, even throughout the whole duration of the flower, rising scarcely above

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the *involucrium*, instead of being four times longer: thirdly, in the *flower* being whitish, or sulphur-coloured, not purple: fourthly, in the total want of *glands*, or abortive *flames*, at least in the specimen seen by professor De Candolle; which are very abundant in the preceding species.

8. *A. Nuttalliana*. Louisiana Anemone. De Cand. n. 7. —Leaves ternate, palmate, many-cleft; segments linear, elongated. *Involucrium* in numerous linear divisions. Flower erect. Petals six, straight, converging. —Gathered in Louisiana, by Mr. Nuttall. The habit resembles *A. Pulsatilla*, but the *leaves* are ternate, not pinnate. *Footstalks* three inches long, covered with close hairs. *Flower-stalk* from six to twelve inches high; sometimes smooth. *Involucrium* very hairy at the base. *Partial stalk* various in length. *Flower* purplish. *Petals* acute, externally hairy, eight or ten lines long. *Fruit* like *Pulsatilla*. De Cand.

Seet. 2. *Pœonanthis*. Ehrh. Phytoph. 95.

Seeds terminating in long bearded tails. *Involucral leaves* ternate, stalked, pinnate, with deeply serrated, notched lobes. Petals five or six. No glands, or abortive filaments. Radical leaves ternate; their divisions pinnate, doubly compound, cut and serrated. Flowers white or yellowish.

9. *A. alpina*. Alpine Anemone. Linn. Sp. Pl. 760. De Cand. n. 8. Willd. n. 8, β . Ait. n. 6. Ehrh. Phytoph. 95. Crantz Auftr. fasc. 2. 105. t. 3. f. 2. Villars Dauph. v. 3. 726. (A. n. 1149; Hall. Hist. v. 2. 62. A. alpina alba major; Bauh. Pin. 176. Prodr. 94. Pulsatilla prima alpina; Dalech. Hist. 850.)

β . Flower white, as in α , but much smaller. (A. alpina; Jacq. Austr. t. 85. Willd. n. 8, α . A. fylveitris altera; Cluf. Hist. v. 1. 245. Pulsatilla alba; Lob. Ic. 282. Dalech. Hist. 849. P. flore alba; Ger. Em. 386.)

γ . Fl. large, yellow. (A. apii folia; Jacq. Misc. v. 2. 47. t. 4. Willd. n. 9. A. fulpurea; Linn. Mant. 78. A. myrrhidifolia β ; Villars Dauph. v. 3. 727, from the author. A. n. 1149, β ; Hall. Hist. v. 2. 63. Pulsatilla lutea; Camer. Epit. 393. P. tertia; Dalech. Hist. 851, bad.)

Leaves ternate, pinnate, with pinnatifid, decurrent, serrated lobes. *Involucral ones* similar. Petals six, spreading. —Native of pastures and rocky declivities in most alpine parts of the middle of Europe, Switzerland, the Pyrenees, the south of France, Austria, Carinthia, &c.; flowering in summer. The conformity of structure between the *involucrium* and the radical *foliage*, clearly ascertains this species. We readily concur with Haller and De Candolle, that the difference of colour between the yellow, lemon-coloured, or white *flowers*, or of size between the large-white and the small, indicate mere varieties. But we scarcely fee any reason to mark the more or less hairy *leaves* as permanent varieties; the former being caused by more dry and exposed situations of the same plant. The *petals* are always more or less pale, purplish, and hairy, at the back. The flowering plant is from two to twelve inches high. When in seed its dimensions are every way doubled. A singular monstrosity of variety β , sent us by the late Mr. Davall, has one of its *petals* slipped down, if we may so express it, into the *involucrium*, and greatly enlarged. This, as M. De Candolle justly observes, proves an analogy between the *petals*, (his *calyx*;) and the *involucrium*; but it will not prove them to have more affinity than the *petals* and actual *leaves* of a Tulip, which we have several times seen running into each other, or half and half of the perfect nature of each.

Seet. 3. *Pulsatilloides*. De Candolle.

Seeds very hairy. Petals from seven to twenty, oblong. *Involucrium* of two or three leaves, somewhat sheathing at

their base; cut and toothed upwards. Leaves twice ternate, cut.

10. *A. capensis*. Broad-leaved Cape Anemone. Lamarck Dict. v. 1. 164. De Cand. n. 9. (Atragene capensis; Linn. Sp. Pl. 764. Willd. Sp. Pl. v. 2. 1286. Ait. Hort. Kew. v. 3. 342. Andr. Repof. t. 9. Curt. Mag. t. 716. Pulsatilla foliis trifidis, dentatis, flore incarnata, pleno; Burm. Afric. 148. t. 52.) —Leaves twice-ternate, rigid, smooth; segments wedge-shaped, sharply toothed. —Native of lofty acclivities of mountains, at the Cape of Good Hope, flowering from October to March. It is said to have been first cultivated in England, by Messrs. Lee and Kennedy, in 1795. This plant is somewhat caulescent, but the *leaves* are crowded about the lower part, almost close to the woody root. Their texture is extremely firm; their segments varying greatly in size, breadth, and shape; the young ones villous. *Flowers* one or two from each *involucrium*, which resembles the leaves, but is smaller, with a dilated inflated stalk. The *partial flower-stalks* are long and downy. *Petals* thirteen to eighteen, linear-oblong, above an inch in length, pink, or pale bluish-coloured, spreading, very handsome. *Germens* extremely hairy, ovate, each with a recurved style.

11. *A. tenuifolia*. Fine-leaved Cape Anemone. De Cand. n. 10. (Atragene tenuifolia; Linn. Suppl. 270. Willd. Sp. Pl. v. 2. 1286. Thunb. Prodr. 94. A. tenuis; Thunb. Jap. 239, note.) —Leaves thrice-ternate, rigid, smooth; leaflets pinnatifid, with linear-threadshaped, acute, entire lobes. —Found by Thunberg at the Cape of Good Hope. The *leaves* are more compound, and more finely divided than those of the preceding species; the plant is described as more caulescent, and the *flowers* but half as large, with only from seven to nine *petals*. We have seen no authentic specimens, but are not without a suspicion that Linnæus confounded this with the last.

Seet. 4. *Anemonanthea*. De Cand.

Seeds nearly ovate, hooked with the permanent style, either very hairy or shaggy, or in some instances nearly smooth. *Partial-flower-stalks* solitary in each *involucrium*, or very rarely two together, always single-flowered and naked. Petals from five to fifteen.

* *Involucral leaves sessile. Root-stock tuberous, somewhat ovate.*

12. *A. coronaria*. Poppy Garden Anemone. Linn. Sp. Pl. 760. De Cand. n. 11. Willd. n. 10. Ait. n. 7. Curt. Mag. t. 841. Sm. Fl. Græc. Sibth. t. 514, unpubl. Lamarck f. 1. (Anemone; Camer. Epit. 386. A. hortensis tenuifolia, simpliciflora, n. 2—20; Cluf. Hist. v. 1. 255—260; also pleno flore; ibid. 263. A. tuberosa radice, et cocinea multiplex; Lob. Ic. 277. Ger. Em. 374; see also several in his subsequent pages.) —Leaves twice ternate, pinnatifid; segments linear-wedge-shaped, smooth-edged, sharply cut. *Involucrium* sessile, many-cleft. Petals six, oval, concave, converging. —Native of dry, as well as rather moist, pastures, in the south of France, Italy, and the Levant, flowering in the early spring. Very common on dry hillocks in Greece, according to Dr. Sibthorp, who concurred with former botanists in thinking it the *ανιμων* *ιμαρια* of Dioscorides; and the learned Sprengel takes the *ανιμων* of Hippocrates to be the same plant. This species, however, bears the same name in modern Greek, *παπαρδισα*, as the Field Poppy, *Papaver Rhæas*; nor is the history of these two flowers, however different, free from ambiguity. *A. coronaria* has been the delight of florists ever since the time of Gerarde, and its numerous double varieties, displaying every beauty and splendour of colour, are among the most rare and admired decorations of a parterre. We

confess

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confess a predilection for the single kinds, equally beautiful and various in colour, which may be raised abundantly from seed in any airy and sunny spot, and require but little trouble in transplantation every fourth or fifth year. They flower most in the winter or spring. The leaves vary in breadth. The natural colour of the flowers, which is cup-shaped, and full two inches broad, is a light purplish-blue, as represented in Dr. Sibthorp's drawing, and as we have gathered it in the groves and grassplots of the Roman villas. The seeds are covered with long, soft, tenacious down, concerning the effect of which an amusing story is told by Tournefort and Miller. A lawyer in the south of France stole these seeds from a covetous amateur, by ordering his page to drop, as if by accident, the silk train of his robe, when they passed over the bed of seeding Anemones, and thus obtained a plentiful supply.

13. *A. pumilla*. Dwarf Anemone. De Cand. n. 12.—Leaves three ternate, pinnatifid, many-cleft, with linear pointed segments. Involucrum sessile; cut at the summit. Petals six, oblong, distant.—Gathered in Cyprus by Labillardiere. Nearly akin to the last, and perhaps a variety. Root tuberous, the size of a fiberd. Leaves smooth, stalked, with narrow linear segments. Flower-stalk a finger's length, slender, downy, erect. Involucrum of three leaves, acutely cut and toothed at the apex. Partial stalk either the length of the involucrum, or twice or thrice as long. Flower erect, pale purple. Petals six, rarely but four or five, oblong, bluntly, distant and spreading, about four times the length of the stamens. Seeds woolly, collected into an oval-oblong head. De Cand.

14. *A. pavonina*. Peacock Garden Anemone. Lamarck Dict. v. 1. 166. De Cand. n. 13. "Fl. Franc. v. 5. 634." Brot. Lufit. v. 2. 363, not 263. (*A. hortenensis latifolia*, pleno flore, et flore cocineo; Cluf. Hist. v. 1. 261, 262, with three figures. *A. maxima chalcædonica polyanthos*; Ger. Em. 375. Lob. Ic. 278. *A. stellata*, geranii aut acroniti folio, duplicato flore purpureo; Cupan. Panph. v. 1. t. 121. ed. 2. t. 22.)—Leaves ternate or deeply three-lobed; leaflets or segments wedge-shaped, cut and toothed. Involucrum sessile, its leaves oblong, entire or slightly cut. Petals ten or twelve, lanceolate, very acute.—Found in vineyards in Navarre, also in the south of France, and probably in the Levant. De Candolle. Differs from *A. coronaria* in its less divided leaves, and especially those of the involucrum, which are five or six, elliptic-lanceolate, rough-edged, most of them quite entire, one or two only partially notched. The narrow and acute petals are also peculiar. We feel convinced with Lamarck and De Candolle that this must be a distinct species, though confounded by Linnæus and others with the more frequent *A. coronaria*. We have not sought out its varieties among the double Anemones, but there is a scarlet one not uncommon. The French know more of these varieties by the names of *Œil de paon*, *Candiotte*, &c. If this be not distinct, it should seem to belong to the following rather than to any other.

15. *A. hortenensis*. Starry Garden Anemone. Linn. Sp. Pl. 761. Willd. n. 11. Ait. n. 8. Curt. Mag. t. 123. Sm. Fl. Græc. Sibth. t. 515, unpubl. (*A. hortenensis latifolia simpliciflora*, n. 3—18; Cluf. Hist. v. 1. 249—254. *A. prima*; Dod. Pempt. 434. *A. secunda*; Camer. Epit. 387. *A. tuberosa*, bulbocastani radice; Lob. Ic. 279. Ger. Em. 375. f. 5. A. n. 1152; Hall. Hist. v. 2. 64. *A. stellata*; Lamarck Dict. v. 1. 166. Brot. Lufit. v. 2. 363. Savi Etrusc. v. 2. 122. De Cand. n. 14. "Fl. Franc. v. 5. 634.")—Leaves ternate; leaflets wedge-shaped, rough-

edge, three-cleft, cut. Involucrum sessile; its leaves lanceolate, undivided or partly cut. Petals ten or twelve, elliptic-lanceolate, obtuse.—Found on banks, ruins, or bushy waste ground, in the south of Europe; very commonly in Italy and Greece, flowering in the early spring; less abundantly in the south of France, and Switzerland. Clusius observed this species near Mentz. It has been known in gardens as long as the *coronaria*, but being inferior in beauty and variety, has given place to that popular species. We cannot follow Lamarck in its specific appellation, because there is no end of changing names for the better; unless all leading botanists would concur in a general reform; and even in that case, positively erroneous names only should be altered. This pretty species has an oblong tuberous root, producing many leaves and stems. The latter are ternate, on long stalks; their leaflets coriaceous, strongly veined, either cut half way down into three broad lobes, or divided nearly to the base, into three subdivided narrow ones; their segments all acute; their edges remarkably rough, though both surfaces are usually, if not always, smooth and naked. Involucral leaves three, an inch long, silky, rough-edged; one of them in general slightly notched at the end. Partial stalk long, silky, especially near the top. Flower scarcely above an inch wide, of a delicate rose-colour, or full carnation; the petals silky at the back, veiny, often emarginate. The rough-edged leaves and involucrum are characteristic of this species, but the involucrum of *pavonina*, (we have not examined its leaves,) has the same character, which *coronaria* has not. We are strongly persuaded of *pavonina* being a variety of *hortensis*, and that the aceteness or bluntness of the petals is variable.

16. *A. palmata*. Cyclamen-leaved Anemone. Linn. Sp. Pl. 758. De Cand. n. 15. Willd. n. 12. Ait. n. 9. Andr. Repof. t. 172. Vahl Symb. v. 3. 73. Desfont. Atlant. v. 1. 432. (*A. hortenensis latifolia, simpliciflora* flore; Cluf. Hist. v. 1. 248. Morif. sect. 4. t. 25. f. 3. *A. latifolia* Clusii; Lob. Ic. 279. Ger. Em. 376. *A. latifolia flava*; Barrel. Ic. t. 792.)—Leaves simple, heart-shaped, rounded, with three or five blunt, sharply-toothed lobes. Involucrum sessile; its leaves in three linear, acute, hairy lobes. Petals ten or twelve, oblong, obtuse.—Native of rather moist waste ground, in Portugal, Spain, the south of France, and the north of Barbary, flowering early in spring. Rarely cultivated with us, except in curious gardens, though the brilliant golden flowers are very handsome. The leaves, notwithstanding Mr. Andrews's doubts, are truly palmate, differing from the last in being simple, and, though more or less hairy, not rough at the edges as in that species. They are coriaceous, strongly veined; often purple beneath. The involucral ones are three, almost uniform, hairy or silky, an inch long, narrow, each divided about half way into three nearly equal, sometimes notched, linear lobes; the edges apparently fringed, but not rough. Stalk above the involucrum rather long, silky. Flowers an inch and a half or two inches broad. Petals linear-obovate; the six outer ones remarkably hairy externally, and so disposed in Linnæus's only specimen, that he took them for the same kind of close calyx as occurs in *Hepatica*, only with a double number of segments. Thus he was led to place *A. palmata* in his first section, *Hepatica*, and this will solve Vahl's difficulty, recorded in his *Symbolæ* above cited. But it will not account for this author's extraordinary quotation of Linnæus's words, which are "*calyx hexpartitus, integerrimus, villosus, coloratus, nec a flore remotus*. Vahl cites this passage, "*calyx hexaphyllus, coloratus, a flore remotus*." The supposed double variety of the present species,

cies,

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much shorter than the involucreum, and the small blue flower has only four or five roundish, very obtuse petals, more like *A. nemorosa*, except in colour.

*** *Involucral leaves stalked. Root-stalk cylindrical, slender, elongated.*

24. *A. baldensis*. Strawberry-fruited Anemone. Linn. Mant. 78. De Cand. n. 23. Willd. n. 14. Allion. Pedem. v. 2. 172. t. 44. f. 3, and t. 67. f. 2. (*A. fragifera*; Jacq. Misc. v. 2. 55. Ic. Rar. t. 103. *A. alpina*; Scop. Carn. v. 1. 384. t. 26. *A. n.* 1151; Hall. Hist. v. 2. 63.)—Leaves twice-ternate, many-cleft; segments linear-wedge-shaped, acute. Involucral ones similar, stalked, less compound. Petals eight to ten, elliptic-oblong. Fruit ovate, woolly.—Native of the alpine precipices of mount Baldus, as well as of Switzerland, Dauphiny, Savoy, Austria, the Tyrol, &c., first cultivated in England by Mr. Loddige, in 1792. It flowers early in summer. The root is long and woody. Leaves firm and rather glaucous, smooth, like rue, but narrower; their footstalks hairy, an inch and a half long. Flower-stalk hairy, erect, three or four inches high, with a large three-leaved involucreum below the middle. Flower white, rather larger than *A. apennina*, with fewer and broader petals. Fruit the size and shape of a small strawberry, with the reddish beaks of its seeds sticking out of the copious dense mass of tawny silky wool. Receptacle perfectly cylindrical.

25. *A. nemorosa*. Common Wood Anemone. Linn. Sp. Pl. 762. De Cand. n. 24. Willd. n. 23. Fl. Brit. n. 2. Engl. Bot. t. 355. Prodr. Fl. Græc. Sibth. n. 1249. Curt. Lond. fac. 2. t. 38. Fl. Dan. t. 549. Bull. Fr. t. 3. (*A. nemorum* alba; Ger. Em. 383. Herba sylvestris, ignoti nominis; Brunf. Herb. v. 2. 80. Ranunculi quarta species lactea; Fuchf. Hist. 161. Ranunculus sylvanum; Cluf. Hist. v. 1. 247, 248. *R. candidus*; Trag. Hist. 95.)

26. Michaux Boreal.-Amer. v. 1. 319. Pursh 386. (*A. quinquefolia*; Linn. Sp. Pl. 762. Willd. n. 22. Ranunculus nemorum, fragarie foliis, virginianus; Pluk. Phyt. t. 106. f. 3.)

Leaves ternate; leaflets in three, or five, deep, three-lobed, notched, lanceolate, acute segments. Involucral ones similar, stalked, less compound. Petals six, elliptical.—Common in groves and thickets throughout Europe, where *A. apennina* scarcely occurs, flowering in spring. About the size of that species, with some resemblance of foliage; but there is less difference between the leaflets of the radical leaves and those of the involucreum. The root also is long and slender, not ovate. The flowers are white, often tinged with purple externally, formed of six broad petals, totally unlike *apennina*. The double variety is very elegant. That with five deep lobes in each leaflet, occurs occasionally in England as well as North America, and is evidently a most trifling variety, though Linnæus, led perhaps by Plukenet's bad figure, made it a species.

26. *A. joffyroides*. Wedge-leaved Anemone. "Juff. Ann. du Mus. v. 3. 249. t. 20. f. 3." De Cand. n. 25.—"Leaves twice ternate; leaflets somewhat wedge-shaped, deeply three-toothed. Involucral leaves stalked, ternate; lateral segments divided. Petals five, oblong."—Described by De Candolle, from Juffieu's herbarium, but the native country of the plant is unknown. It is said to be extremely similar to *A. nemorosa*. The root is horizontal. Radical leaves on long stalks, whose partial stalks bear each three nearly wedge-shaped, cut, or toothed, leaflets. The lateral leaflets of each involucreal leaf being divided, give the appearance of five leaflets in each. Flowers one or two to an involucreum. Petals oblong, narrow, elongated. De Cand.

27. *A. lancifolia*. Lanceolate-leaved Anemone. Pursh n. 2. De Cand. n. 26.—Leaves all stalked, ternate; leaflets lanceolate, bluntly toothed. Petals five, ovate, acute.—On high mountains in a boggy soil, in Pennsylvania and Virginia, flowering from May to July. Resembles *A. nemorosa*, but the flowers are larger, of a clear white. Pursh. De Candolle says the leaves scarcely differ from *A. trifolia*, by which we are led to suspect that Plukenet's t. 106. f. 3, cited by Linnæus and others for *quinquefolia*, with which it does not well accord, may belong to the species before us.

28. *A. trifolia*. Three-leaved Anemone. Linn. Sp. Pl. 762. De Cand. n. 27. Willd. n. 21. Ait. n. 16. Dod. Pempt. 436. Ger. Em. 377. Morif. sect. 4. t. 25. f. 1. (*A. trifolia*, flore albo; Bauh. Hist. v. 3. 412. Alabastrites, five Dentaria alba; Lob. Ic. 281.)—Leaves and involucreum stalked, ternate; leaflets of all ovate, acute, ferrated. Petals five or six, elliptical, obtuse.—Native of rather mountainous groves and thickets, in France, Piedmont, Tuscany, Carniola, Carinthia, and Siberia, flowering in spring. Gerarde appears to have cultivated this species, but we have never seen or heard of it in modern times. The root is oblong, horizontal, somewhat toothed. Leaves two or three inches high, each of three leaflets about an inch long, with hairy ribs and edges. Stalk about a span high, or more, angular, smooth, bearing an involucreum of three uniform stalked leaves, like the radical ones, but rather larger; the lateral leaflets very unequal at their base; the central one tapering into the footstalk. Partial flower-stalk about the length of the stalks of the involucreum, solitary, simple, slender, hairy. Flower scarcely an inch broad. Petals from five to seven, white; purplish underneath.

29. *A. minima*. Leaf Anemone. De Cand. n. 28.—"Leaves..... Involucral ones stalked, deeply three-cleft; lobes ovate, pointed, ferrated externally and at the extremity. Petals five, oval-oblong, obtuse."—Native of the Allegany mountains in Virginia; *Palisot de Beauvois*. Remarkably tender and delicate, resembling *A. trifolia*, but only one-third its size. Root long, slender, horizontal, sending out a few fibres. Radical leaves wanting in the specimens. Stalk slender, round, smooth, a finger's length. Leaflets of the involucreum closely downy; the lateral ones strongly ferrated at their outer margin, and from the middle to the end at both margins. Partial stalk the length of the involucreum, erect, downy, simple. Flower small, white. Petals smooth, four lines long, and two broad. Stamens half as long. Germens few, downy. De Cand.

30. *A. ranunculoides*. Yellow Wood Anemone. Linn. Sp. Pl. 762. De Cand. n. 29. Willd. n. 26. Fl. Brit. n. 4. Engl. Bot. t. 1484. Fl. Dan. t. 140. Savi Etrusc. v. 2. 123. (*A. n.* 1153; Hall. Hist. v. 2. 64. *A. nemorum* lutea; Ger. Em. 383. Ranunculi quarta species lutea; Fuchf. Hist. 162. *R. tertia* species; Card. Annot. 120, with Tragus's figure of *A. nemorosa*, of which the larger part resembles that species, the smaller this. Ranunculus nemorosus luteus; Bauh. Pin. 178. Lob. Ic. 674. Morif. sect. 4. t. 28. f. 11.)—Leaves ternate or quinate; leaflets three-lobed, deeply notched; wedge-shaped at the base. Involucral ones similar, ternate or quinate, somewhat stalked. Flowers mostly in pairs. Petals five or six, elliptical.—Frequent in groves, thickets, and hilly pastures, throughout the north and middle of Europe, as well as Siberia and part of Caucasus, but rare in England. Mr. Hudson found it in Kent and Hertfordshire; and the late Mr. Geo. Anderson brought us specimens from near Abbot's Langley, flowering early in April. The root is slender, horizontal. Herbage not unlike *A. nemorosa*, but the

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the leaflets are more elongated and cut, and the stalks of the involucre much shorter. The petals are broader, and of a full yellow. *Flowers* often two together, one of which, according to De Candolle, is sometimes deficient in pistils. The partial stalk appears to droop as the fruit ripens. The germens are nearly orbicular, compressed, downy, the style of each forming a strong incurved beak. There is said to be a violet-coloured variety found on the Pyrenees.

31. *A. reflexa*. Reflexed Anemone. Stephen. in Willd. n. 25. De Cand. n. 30.—“Leaves ternate; leaflets somewhat three-cleft, toothed at the extremity. Involucral ones similar, stalked. Petals five or six, linear, obtuse, reflexed.”—Native of Siberia. *Stalk* slightly downy at the top, slender, a palm in height. *Involucral leaves* smooth, on downy stalks; their leaflets acute, tapering at each end. *Partial stalk* solitary, shorter than the involucre while in flower, erect, slightly hairy. *Flower* yellow, one-third the size of the last. *Stamens* very numerous, shorter than the petals. De Candolle, Willd.

**** *Involucral leaves stalked. Root of tufted fibres.*

32. *A. sylvestris*. Snow-drop Anemone. Linn. Sp. Pl. 761. De Cand. n. 31. Willd. n. 15. Ait. n. 12. Curt. Mag. t. 54. Bull. Fr. t. 59. (*A. sylvestris prima*; Cluf. Hist. 244. *A. tertia*; Matth. Valgr. v. 1. 565. Lob. Ic. 280. Camer. Epit. 388. Dalech. Hist. 843. *A. Matthioli*; Ger. Em. 377. *A. n. 1150*; Hall. Hist. v. 2. 63.)—Leaves ternate or quinate; leaflets lobed; deeply notched at the end. *Involucral ones* similar, stalked. *Flower* solitary. Petals six, elliptical. Fruit very woolly. *Root* fibrous.—Found in woods and hedges in various parts of France, Switzerland, the north of Italy, Germany, Siberia, &c. but not in England, though a very desirable hardy perennial in our gardens, flowering in spring, and sometimes in autumn. The root consists of long, black, rather stout fibres, and creeps rather extensively. Leaves large, dark-green, veiny, nearly smooth, coarsely notched; their leaflets or lobes wedge-shaped at the base. *Flower-stalk* fifteen or eighteen inches high, erect, downy at the top, bearing about the middle three, rarely four, large, stalked involucreal leaves, whose leaflets, five or more, are scarcely distinct at the base. *Flower* pure white, rarely purplish, or greenish, externally downy; its petals near an inch long, slightly coriaceous. *Fruit* ovate, the seeds cohering for some time by their dense cottony wool, which at length, by spreading itself, wafts them away. We have one Swiss specimen with two partial stalks, one of which bears a partial involucre, as in the next section.

33. *A. alba*. Cotton Anemone. “Juss. Ann. du Mus. v. 3. 248. t. 20. f. 1.” De Cand. n. 32.—“Leaves ternate or quinate; leaflets deeply toothed at the end. Involucral ones similar, stalked. *Flower* solitary. Petals five, obovate. Fruit very woolly. *Root* fibrous.”—Native of Dauria, and the Crimea. Very like the last, but rather smaller. Petals five, not six, shorter, rounder, and very obtuse. The seeds are so woolly, that Demidow asserts they supply the place of cotton. De Candolle. We concur in opinion with our author, that this plant is probably a variety, we should say a very slight one, of the foregoing species. If distinct, the name of *gossypina* would have been far preferable to *alba*. We would also suggest, that this last division of the fourth section of the genus, rather belongs to the fifth, which is shewn by its habit, and by the casual variation in the inflorescence of *A. sylvestris* above noticed, of which we have seen more examples.

SECT. 5. *Anemonespermis* of De Candolle; not of former authors.

Seeds rather compressed, villous, hooked with the per-

manent style: Petals five, very rarely ten. Umbel spuri-ously composed, there being several stalks in one involucre; one of them naked and single-flowered; two or three others bearing each a two-leaved partial involucre, from whence springs a single-flowered stalk.

34. *A. virginiana*. Virginian Anemone. Linn. Sp. Pl. 761. De Cand. n. 33. Willd. n. 16. Ait. n. 13. Pursh n. 10. (*A. virginiana*, tertie Matthioli similis, parvo flore; Herm. Parad. 18, with a plate.)—Leaves ternate, downy; leaflets three-cleft, pointed, notched, sharply serrated. General and partial involucre similar, stalked. Petals five, elliptical.—In woods, on the sides of dry sandy hills, from Canada to Carolina, flowering in May and June. *Flowers* small, greenish-yellow. *Pursh*. The leaflets and their segments are much more pointed, and more sharply and copiously serrated, than in *A. sylvestris*. Whole herb downy, soft to the touch. Seeds very woolly, in an oval head, on a cylindrical receptacle.

35. *A. multifida*. Magellanic Anemone. “Poiret in Lamarck Suppl. v. 1. 364.” De Cand. n. 34.—Radical leaves ternate; leaflets in many deep linear segments. General and partial involucre similar, many-cleft, somewhat stalked. Petals five to ten, elliptical, obtuse.—Gathered by Commerçon from the straits of Magellan. The root is woody. Radical leaves on long, loosely hairy, stalks. *Common flower-stalk* stout, erect, taller than the leaves, about six inches high. *General involucre* of three leaves, about two inches long, including their broad hairy stalks, being rather larger than the radical leaves, but all similarly divided into linear, or narrow-wedge-shaped, partly three-cleft, loosely hairy, lobes. *Partial flower-stalks* three; the middle one earliest, four or five inches long, hairy, leafless; the others much shorter, spreading, each bearing two smaller, but otherwise similar, involucreal leaves; all single-flowered. *Flowers* about the size of *A. apennina*, pale yellow, or buff-coloured, according to Commerçon; externally hairy. Seeds hairy, collected into a globular head.

M. De Candolle saw, in the Banksian herbarium, a plant from Hudson's bay, which he considered as a variety, differing from the Magellanic specimens in having only one flower; or, at most, two, one of which bore a partial involucre below the middle. He suggests that it may possibly constitute a distinct species.

36. *A. pennsylvanica*. Pennsylvania Anemone. Linn. Mant. 247. De Cand. n. 35. Willd. n. 19. Ait. n. 14. Pursh n. 8. (*A. irregularis*; Lamarck Dict. v. 1. 167. De Cand. *A. aconitifolia*; Michaux Boreal-Amer. v. 1. 320.)—Leaves deeply three-cleft; segments three-lobed, notched, acute. Involucral ones similar, sessile. Petals five, elliptical. Seeds villous.—In meadows, and on the borders of woods, from Canada to Pennsylvania, flowering in June and July. *Flowers* large, white, with yellow anthers. *Pursh*. Sir Joseph Banks has specimens from Fort Albany and Hudson's bay. De Cand. We have one from the late Peter Collinson's garden at Mill-hill, probably of an earlier date than 1766; see Hort. Kew. This is a tall, apparently caulescent, species, whose flower-stalk is angular, a foot and a half or two feet high, twice forked, and vari-ously compound. The radical leaves we have not seen; De Candolle describes them with long footstalks, as tall as the flowering stalk, and deeply divided into three or five principal lobes, which are oblong-lanceolate; wedge-shaped at the base; pointed, cut and toothed, at the extremity. Such, nearly, are the general, as well as partial, involucreal leaves, but sessile, the former three, the latter two, at each division of the stalk; all strongly ribbed, two or three inches long, slightly downy with small, close, scattered hairs.

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Partial stalks long, straight and slender, single-flowered, rarely somewhat leafy. *Petals* three-quarters of an inch long, obtuse. *Seeds* compressed, pointed, sparingly downy. A variety, or perhaps a distinct species, found by Laxmann in Siberia, is mentioned by De Candolle, which approaches *A. narcissiflora* in the first appearance of its *inflorescence*, but is really more akin to *pennsylvanica*, differing, as it seems, chiefly in the situation of each small *partial involucrem*, near the bottom of their respective stalks. We have not seen any specimen.

37. *A. dichotoma*. Forked Anemone. Linn. Sp. Pl. 762. De Cand. n. 36. Willd. n. 20. Ait. n. 15. Pursh n. 9, excluding the syn. of Lamarck. Linn. Fl. Dec. 2: 29. t. 15. (A. n. 37; Gmel. Sib. v. 4. 197, excluding the synonymy. *Ranunculus Brasiliensis*; Linn. Am. Acad. v. 1. 155. n. 102.)—Leaves deeply three-cleft; segments oblong, cut and toothed at the end. Involucral ones filular, sessile, all two-leaved. *Petals* five, elliptical. *Seeds* smooth.—Frequent throughout Siberia. *Gmelin*. In wet woods, and natural meadows, of Canada, and the western parts of New York, flowering in May and June. *Pursh*. *Root* slender. *Herb* smaller than the preceding, and smoother, with only two leaves to the *general involucrem*, and the *leaflets* or segments have larger, but much fewer, teeth or serratures. The *flower* moreover is smaller, tinged with red on the outside; and the *seeds* are smooth.

38. *A. mexicana*. Mexican Anemone. "Humb. Bonpl. et Kunth, MSS." De Cand. n. 37.—"Leaves three-cleft; segments oval, somewhat wedge-shaped, deeply toothed. Involucral ones in pairs, sessile, cut. *Germens* downy."—Native of Mexico, near Santa Rosa. *Herb* rather hairy all over. Segments of the leaves scarcely pointed; the lateral ones often divided. *General involucrem* of only two leaves, its central *flower-stalk* naked; the lateral *stalks*, from one to three, bearing a small two-leaved *partial involucrem* near the bottom. *Flowers* white, much like *pennsylvanica*. *Germens* downy, oblong, taper-pointed. De Cand.

39. *A. helleborifolia*. Hellebore-leaved Anemone. De Cand. n. 38.—"Leaves pedate; leaflets smooth, rather coriaceous, three-cleft; wedge-shaped at the base, and somewhat stalked; lobes serrated, acute. Involucral ones all three-leaved, nearly sessile. *Germens* smooth."—Gathered by Dombey, near Huafa-Huafi, in South America. A handsome very distinct species. *Root* round, rather thick, with numerous fibres. *Radical leaves* numerous, on hairy stalks three or four inches long. *Flower-stalk* round, hollow, twelve or eighteen inches high; its first branches three or four, long and smooth; secondary ones rather hairy, mostly three-flowered. *Involucral leaflets* rather snaggy at their base, three-cleft; their lobes three-cleft, serrated, acute. *Flowers* white. *Petals* five, oval. *Stamens* short. *Seeds* fifteen to twenty, oval, smooth, each with a hooked style, crowded upon a hairy receptacle. Sometimes a third *partial involucrem* is found under the flower. De Cand.

40. *A. viifolia*. Vine-leaved Anemone. Buch. MSS. De Cand. n. 39.—Leaves palmate, acutely seven-lobed, serrated; downy and hoary beneath. Involucral ones similar, three or five-lobed, stalked, heart-shaped, two or three together. *Petals* five, obovate. *Germens* smooth.—Gathered by Dr. Francis Buchanan, near Sembu (not Lamba), and Narainhetty, in Nepal, flowering in August and September. The *radical leaves*, in his own specimens, are from six to ten inches wide, smooth above, strongly and copiously veined, cut more than half way down, into three principal, pointed lobes, with two or three more shallow, rounded, and imperfect ones at each side. *Footstalks* a foot long, angular, hairy. *Involucral leaves* much smaller, and

less lobed; their *stalks* of various proportions; three at the first subdivision of the tall downy *flower-stalk*; two at the upper ones. *Flowers* the size of *A. sylvogstris*, white; externally silky, reddish, and strongly ribbed. *Seeds* numerous, covering a globular receptacle, interspersed with long, white, woolly down. This species is remarkable for the great size, and white downy backs, of its *leaves*, some of which rival those of *Rubus odoratus* in dimensions.

41. *A. rivalaris*. Water Anemone. Buch. MSS. De Cand. n. 40.—Leaves ternate, hairy on both sides; leaflets wedge-shaped, three-cleft, notched, and sharply toothed; involucral ones sessile, deeply three-lobed, pinnatifid, cut. *Petals* five, ovate.—Native of the moist banks of rivulets in Upper Nepal; gathered by Dr. Buchanan, near Chitlong, April 12, 1802. *Root* rather woody, as thick as the thumb. *Radical leaves* numerous, three inches broad, on hairy stalks from four to eight inches long. *General involucral ones* three, larger, more elongated and pinnatifid; *partial two*, with still narrower lobes. *Flowers* half the size of the last, white; purplish and hairy beneath.

Seet. 6. *Omalocarpus*. De Candolle.
Seeds compressed flat, oval-orbicular, very smooth, perfectly destitute of point or tail. *Flower-stalks* numerous, single-flowered, naked, forming an umbel in the involucrem; rarely solitary.

42. *A. narcissiflora*. Narcissus-flowered Anemone. Linn. Sp. Pl. 763. De Cand. n. 41. Willd. n. 27. Ait. n. 20. Pursh n. 7. Jacq. Austr. t. 159. Curt. Mag. t. 1120. (not 1170.) Crantz Austr. fasc. 2. 102. t. 3. f. 1. (A. n. 1155; Hall. Hist. v. 2. 65, excluding the references to Matthioli and Lobel. *Ranunculus alpinus*, narcissi flore, et R. montanus albus hirsutus; Bauh. Hist. v. 3. app. 844, 845. R. montanus 2 and 3; Cluf. Hist. v. 1. 235. R. hirsutus alpinus, fl. albo, et R. montanus hirsutus purpureus; Ger. Em. 956. *Aconitum candidum*; Dalech. Hist. 1743.)

β. Willd. et De Cand. (A. fasciculata; Linn. Sp. Pl. 763. *Ranunculus orientalis*, *aconiti lycoctoni folio*, *flore magno albo*, vel *purpurascente*; Tourn. Cor. 20. Voy. v. 2. 106, with a plate.)

γ, monantha. De Cand. (A. dubia; Bellard. App. ad Pl. Pedem. 26. t. 5, (not 232. t. 7.)

Radical leaves slightly hairy, in three or five, very deep, wedge-shaped segments, with many, unequal, linear-lanceolate lobes. *Flowers* umbellate.—Found in mountainous pastures, especially on a calcareous soil, almost throughout the northern hemisphere; in the Pyrenees and all the alpine countries, in Siberia, Caucasus, Cappadocia, as well as in Canada, and on the north-west coast of America; but not in Britain, Greece, nor the Archipelago, as far as we have any information. It flowers early in summer, and is of an elegant appearance, though seldom seen in gardens. The umbel of pure white flowers, with obovate petals, occasionally tinged, especially underneath, with purple, readily distinguishes this species. The *involucrem* is sessile, divided like the *leaves*, and like them hairy on both sides, but not particularly so at the edges. The *germens* and broad *seeds* are quite smooth. Tournefort's plant, our β, is a very slight variety, with a more dense umbel. We know Dr. Bellard's *A. dubia* merely from his figure, for he himself never saw more than one specimen; but we concur with professor De Candolle, who appears to have occasionally seen a two-flowered specimen, in making it a variety. Concerning the two Siberian plants, to which De Candolle alludes, as possible varieties of *narcissiflora*, we have not materials to form any opinion; nor were those with which he was furnished quite satisfactory.

43. *A. umbellata*. Fringed Umbellate Anemone. Willd. n. 28. De Cand. n. 42. (*A. fasciculata*; Vahl Symb. v. 3. 74, excluding the synonym. *Ranunculus orientalis*, napelli folio lanuginoso, flore albo; Tourn. Cor. 20.)—"Radical leaves in three or five, very deep, three-cleft, entire, densely fringed segments. Flowers umbellate.—Gathered by Tournefort, on the mountains of Cappadocia. De Candolle, who examined his original specimens, describes the radical leaves as consisting of numerous deep segments, which are three-cleft, acute, with entire lobes, whose margins are densely fringed, with very long, white, close-pressed hairs, such as occur on the *footstalks*, scarcely two inches in length. *Flower-stalk* a palm in height, with similar, but more scattered, hairs. *Involucral leaves* deeply three-cleft; their lobes entire, chiefly hairy at the edges. *Partial stalks* two or three, simple, longer than the *involucrum*. *Petals* five, white, oval, obtuse, externally hairy. We have Siberian specimens, probably such as M. Patrin communicated to De Candolle. These answer to his description of the hairy-edged leaves, but seem to us not specifically distinct from *nariciflora*, with which they agree in size, and in certain pale glands, between the segments of the leaves, peculiarly visible in these Siberian specimens, though not noticed by authors in any. We suspect that these specimens may prove the identity of *A. umbellata* and *nariciflora*.

44. *A. sibirica*. Siberian Tawny Anemone. Linn. Sp. Pl. 763. De Cand. n. 43. Willd. n. 13. (*A. n. 41*; Gmel. Sib. v. 4. 199.)—Leaves deeply three-lobed; lobes wedge-shaped, in many deep, linear-oblong, bluntish, fringed segments. Involucral ones similar, on short stalks, partly notched. Flower solitary. Petals six, orbicular. Gernens smooth.—Native of Siberia, from the river Yenisey to the country beyond the lake Baikal. Gmelin. That author says not a word more concerning the plant in question. One of his specimens is in the Linnean herbarium, and appears evidently allied, in the general nature of its foliage, as well as the smooth germen, to the two last-described. The *footstalks* and the *flower-stalk*, which is only four inches high, bear many, long, scattered, spreading, tawny hairs. The *flower* is an inch and a quarter broad, with orbicular spreading petals, longer than the *involucrum*, and, as far as can be judged from a plant so long dried, they appear to have been yellow, or orange-coloured, resembling a *Trollius*.

† Species not sufficiently known.

45. *A. Walteri*. Walterian Anemone. Pursh n. 5. De Cand. n. 44. (*Thalictrum carolinianum*; Walt. Carol. 157.)—"Radical leaves palmate, on long stalks. Flower-stalk radical, erect, long, single-flowered. Petals five. Root tuberous and fibrous." *Walter*.—Native of Carolina. Mr. Pursh never found this plant, nor could he meet with a specimen in Mr. Walter's herbarium; but he considered it as more probably belonging to *Anemone* than to *Thalictrum*. Professor De Candolle suspects it may prove akin to *A. parviflora*, n. 18.

46. *A. pedata*. Pedate Anemone. "Rafinesque Schmaltz in Desf. Journ. Bot. for 1808. v. 1. 230." De Cand. n. 45.—"Leaves deeply five-cleft, pedate; lobes lacinated. Stalk single-flowered, short. Petals six."—Native of New Jersey. *Raf. Schm.*

†† The following synonyms could not be reduced by De Candolle to any known species.

Anemone n. 1, 2, 4, 5, 6, and 9 of Matthioli; see the Valgriffian edition, v. 1. 563—567, where are figures of the first five, copied in Bauhin's edition of 1598, p. 460, 461; Dalech. Hist. 442—444; and criticised in Bauh. Hist. v. 3. 409. These are very obscure, and perhaps, as De Candolle observes, fictitious; some of the cuts representing

species of *Adonis*, we should say *Papaver*, rather than any *Anemone*.

A. quinta; Camer. Epit. 390, copied in Bauh. Hist. v. 3. 408, 409, by the name of *A. ranunculifolia lutea*. This seems a confusion of *Eranthis (Helleborus) hyemalis*, and *Ranunculus montanus*.

Ranunculus nemorosus, *Anemones flore minor*; Bauh. Prodr. 95.—Found at Montpellier; but not known to Magnol.

A. folio aconiti, radice rapunculi, flore ex purpura albicante; Bauh. Hist. v. 3. 407, no figure.—Found on sunny hills near Warlaw.

A. folio coriandri, radice olivæ, flore purpureo, Tabern; Bauh. Hist. ibid. Probably, as De Candolle suggests, *A. coronaria*.

A. folio multiplicato hirsuto, flore quadrifido, rubro, albo, cæruleo; Bauh. Hist. ibid.—Native of Italy, Sclavonia, and the Morea.

A. Anguillare lutea quadrifolia, foliis multifidis; Bauh. Hist. v. 3. 408.—Native of Apulia.

A. lutea Rauwolfii; Bauh. Hist. ibid.—Found about Aleppo.

Pulsatilla flore obsoleto, caule nudo; Breyn. Cent. 1. 135. Rai Hist. v. 1. 636. Pluk. Almag. 308 (not 30).—Found in the Cassubian mountains, flowering in May. Ray suspects this to be a monifer.

P. orientalis tenuifolius divisa et villosa, flore rubro; Tourn. Cor. 20.

A. stemmenfis; Scop. Ann. Hist. Nat. 2. 54.—Native of mount Feudo, in the Tyrol. This seems, by the author's description, to belong to *A. alpina*, as M. De Candolle suspects. We do not understand the reference of the latter to "Fl. Austr. 2. p. 41." There is nothing to the purpose in that vol. and page of Jacq. Fl. Austr. nor in Scopoli's own Flora Carniolicæ.

A. dodecaphylla; "Krock. Silef. 2. 1. p. 235. t. 20." (*A. decapetalæ* var. β ; Gmel. Syst. Linn. v. 2. 871.)—Found in Silesia.

To these may be added *A. anomala*, Rafinesque in Flora Ludoviciana 82.—"Leaves ternate, sessile, cut. Petals five, unequal. Stem about a foot high.

A. thalictroides. Linn. Sp. Pl. 762. Willd. n. 29. Ait. n. 21. Pursh n. 6. Curt. Mag. 866; is *Thalictrum anemoneoides*; De Cand. Syst. v. 1. 186. Michaux. Boreali-Amer. v. 1. 322. See *Thalictrum* hereafter.

For *A. Hepatica*, Linn. Sp. Pl. 758; see *HEPATICA* hereafter.

ANEURISM. Subsequently to the period when the article ANEURISM was inserted in the early part of this Cyclopædia, many new and valuable observations have been made upon the subject; and the success of operations for the cure of the disease has been proved in a manner which has surpassed the expectations of the most sanguine. The first grand improvement in this branch of operative surgery was unquestionably that of not opening the tumour itself, but cutting down to the vessel at a certain distance from the disease, and there applying the ligature so as to impede the flow of blood into the aneurifimal sac. The removal of the swelling was then left to the gentle and gradual action of the lymphatics; a process infinitely safer than the violent and painful proceeding of laying open the large tumour with a knife, extracting the coagulated blood, and leaving an ample cavity to suppurate. But these were not the only objections to the old method of operating; for the sac was opened, and the artery tied in a situation where its coats were actually in a diseased state. Hence the ligatures mostly failed in their effect; the vessel did not undergo favourably

the

the adhesive inflammation by which it was to be closed; and the patient frequently either lost his life by hemorrhage, or was rescued by the performance of amputation under the worst and most disadvantageous circumstances. The genius of a Hunter was soon struck with the defects of the former plan of operating, and instead of meddling with the tumour itself, and tying the artery in a place where it was in a morbid condition, this distinguished surgeon conceived that it would be far better practice to tie the vessel where it was more likely to be found, *viz.* at a point some way from the disease towards the heart. Thus in the popliteal aneurism, he avoided the painful operation of laying open the swelling in the ham, and more skilfully and scientifically took up the femoral artery itself in the middle of the thigh. From this important innovation, all the success which has characterized this department of modern surgery has unquestionably been derived. By extending the same principles to other cases of aneurism, and putting due confidence in the competency of the collateral and anastomosing vessels to carry on the circulation, some of our present surgeons have devised and practised operations for the cure of such aneurisms, as a few years ago would have been abandoned as hopeless and inevitably fatal. Not only have the carotid, the external iliac, and the subclavian arteries been repeatedly tied with the most successful result, the internal iliac itself, whose situation seems to render it almost inaccessible to the instruments of the most skilful operator, has now had a ligature put round it in two memorable examples, one of which we have already noticed in the article SURGERY. The other operation was performed by Mr. Atkinson, of York; the case being a gluteal aneurism, the same kind of disease for which Mr. Stevens operated at Santa Cruz. The patient, whose name was Thomas Coft, aged twenty-nine, presented himself at the York county hospital, April 29, 1817. He was a tall, strong, active bargeman, not corpulent, but very muscular. He was enduring great pain from a large, renitent, pulsating tumour, situated under the glutæus of the right side, an obvious aneurism. It had existed about nine months, and was the consequence of a blow from a stone. In a consultation with Dr. Lanfon and Dr. Wake, the necessity of the operation was determined upon, and it was performed on the 12th of May, without any material difficulty or interruption, except what depended on the aneurism-needle not being pliable enough, and what was the consequence of the division of, and bleeding from, the small muscular arteries. Having got command of the internal iliac artery within the pelvis, which, says Mr. Atkinson, required the complete length of the fingers to accomplish, the vessel was tied. Sufficient proof of its being the identical artery was repeatedly obtained, by the pressure upon it stopping the pulsation in the tumour. Dr. Wake, Mr. Ward, and all the pupils, were quite assured of the circumstance. The artery being then tied, the pulsation of the swelling entirely ceased. The patient went on tolerably well for some time after the operation; the pulse never exceeded 130, and, after a time, sunk to 85 or 90. He became exhausted, however, partly by the discharge, and partly by hemorrhage, and died on the 31st of May, about nineteen days after the operation. It is to be regretted, that some essential particulars are omitted in the narration of the case, especially those respecting the exact parts divided in the operation, and the place of the external incision; yet, on the whole, whoever reads the account can, we think, entertain no doubt about the important fact, *viz.* that the internal iliac was actually tied. See the Med. and Phys. Journ. vol. xxxviii. p. 267.

Although this operation did not succeed like that ex-

cuted by Mr. Stevens, the record of it is highly interesting, as tending to dispel the doubts which have been entertained about the practicable nature of the proceeding. Even the aorta itself has now been tied in the human subject. Of course, the circumstances which justified such a bold proceeding were desperate in the extreme, nor could much hope of the patient's life be indulged; yet, as it was the only thing from which a possibility of preservation could be derived, we think, notwithstanding its failure, much credit is due to the enterprising surgeon who performed it. We shall introduce a few particulars of the case in another place. See AORTA.

In the article ANEURISM, in the early part of this Cyclopædia, will be found some observations tending to make the reader imagine, that this disease arises from such a kind of weakness as may be supposed to arise from the division of the outer coat or coats of an artery. We therefore take this opportunity of correcting the statement, since it has been fully proved by the experiments of Hunter, Home, Scarpa, &c. that aneurism never originates from this cause; and that even stripping off the external coat of the vessel will not give rise to such an effect.

With respect to tying the subclavian artery for the cure of axillary aneurisms, we ought to have remarked, that the operation, as performed by making an incision above the clavicle, has never had a successful result in this country; but, from a communication lately made to the Medical and Chirurgial Society of London, such an operation appears to have been recently executed with complete success by Dr. Post, of New York. We believe this to be the only instance in which this mode of operating has cured the disease, and saved the patient's life. The artery, however, has been several times taken up in this way in London; and once by the late Mr. Ramsden, and again by Mr. Thomas Blizard; but their patients did not recover. The particulars of Dr. Post's case are inserted in the Medico-Chirurgial Transf. vol. ix. p. 185, &c.

ANGAR ISLAND, in *Geography*, an island of the Persian gulf, somewhat larger than Ormuz, and equally barren. It is now uninhabited, but presents traces of former population in the ruins of a considerable town, and many reservoirs for water. It has two wells and a stream of good water, is covered with pits of salt and metallic ores, and also a soft rocky substance resembling lava: its hills, which are overpread with shells of oysters and other fish, abound in wild goats, rabbits, and partridges. It forms an excellent harbour, which has been recommended for a settlement.

ANGELO AMERIGI, &c. l. 7, r. Domenichino; l. 17, after life, add—The master-piece of all his works, *viz.* the Entombing of Christ, is now in the Louvre at Paris.

ANGIOPTERIS, in *Botany*, from *αγγος*, a vessel, and *πτερις*, a fern, a faulty name, as being composed of one already established.—Hoffm. Comm. Gott. v. 12. 29. Willd. Sp. Pl. v. 5. 69. Swartz in Schrad. Journ. for 1801. 273. t. 2. f. 4. Syn. Fil. 166. (Clematea; Cavan. Leccion. 553.)—Class and order, *Cryptogamia Filices*; sect. *exannulata*. Nat. Ord. *Filices dorstifera*.

Effl. Ch. Capsules aggregate, in elliptical, crowded masses, obovate, of two equal valves, and one cell, without a ring. Involucrum none.

This is one of those curious genera of ferns, which like DANÆA, GLEICHENIA, and MARATIA, (see those articles,) bear their capsules on the back of the leaf, or frond, without either a ring or involucrum. In the present instance, indeed, these capsules are not of many cells, like those of *Danæa* and *Maratia*, but as perfectly simple as in OSMUNDA already described, or BOTRYCHIUM hereafter to be

be mentioned. They are, however, not dispersed, or irregularly placed, but compose oval *masses*, of twelve or more *capules*, which masses are ranged side by side, in a dense uninterrupted line, near the margins of each *leaflet* of the *frond*, a vein from the mid-rib running along the base, or insertion, of each mass, between its two rows of capules. That these *masses* are determinate assemblages of capules of an appropriate figure, is evinced by their having at each end a solitary transverse capule, completing their oval outline, which is not perfectly expressed in Dr. Swartz's figure. The genus is, doubtless, very distinct; and as its present name is not only faulty, but unmeaning, it would be well if *Clementea*, in honour of an able cryptogamic Spanish botanist, Don Simon de Roxas Clemente, had been retained. We should certainly now, without scruple, have restored it, were there not several other names of ferns, composed of *pteris*, which must stand or fall with *Angiopteris*.

1. *A. evecta*. Tall Angiopteris. Hoffm. Comm. Gott. v. 12. 29. t. 5, excluding the synonyms, except Forster's. Swartz Syn. Fil. 166. 395. Willd. n. 1. (*Polypodium evectum*; Forst. Prodr. 81. *Clementea palmiformis*; Cavan. Leccion. 554.)—Native of the Society Isles, and of Maria's islands. We have an Otaheite specimen from Mr. Menzies. The main stem is said to be arborescent, five feet high, and a span in diameter. *Fronde* six feet long, doubly pinnate; *leaflets* from two to four inches long, opposite, sessile, linear-lanceolate, taper-pointed, smooth, as well as their common stalk; their margins finely crenate, the point serrated. *Capules* brown, smooth, very numerous, scarcely larger than grains of sea-lead.

ANGLE, RECTILINEAR, l. 2, for I. r. II.

ANGLE at the Periphery, for I. r. II.

ANGOY. See GOY and LOANGO.

ANGRA, l. 1, r. Terceira.

ANGUILLA. For MYTUS r. MYRUS.

ANGUILLARIA, in *Botany*, a genus dedicated by Mr. Brown, to the memory of LUIGI ANGUILLARA, (see that article,) apothecary, in the university of Padua, to the Venetian republic, who left an Italian work on the *Materia Medica*, which has been published at various times, and translated into Latin. Haller speaks of its author as deeply learned in this subject, and perhaps the best Italian botanist of the earlier part of the sixteenth century, having travelled much in Europe and the Levant, and studied critically the writings of those who had gone before him. Gærtner has called a genus *Anguillaria*, from the singular appearance of its embryo, resembling an eel, *Anguilla*; but this is the *ARDISIA* of all authors at present. (See that article.)—Brown Prodr. Nov. Holl. v. 1. 373.—Class and order, *Hexandria Trigynia*. Nat. Ord. *Tripetaloides*, Linn. *Junci*, Juss. *Melanthaceae*, Brown.

Gen. Ch. *Cal.* none, unless the corolla be so called. *Cor.* Petals six, lanceolate, inferior, spreading, equal, deciduous, each furnished with a claw. *Stam.* Filaments six, inserted into the base of each petal, awl-shaped, shorter than the corolla; anthers oblong, petate, reversed. *Pist.* Germen superior, oblong, furrowed; styles three, spreading, shorter than the filaments; stigmas acute. *Peric.* Capsule ovate-oblong, naked, of three cells and three valves, the partitions from the middle of each valve. *Seeds* numerous, nearly globular.

Eff. Ch. Calyx none. Petals six, equal, stalked, deciduous. Stamens inserted into the claws. Stigmas acute. Capsule of three cells, with many seeds.

Obs. *Anguillaria* is nearly akin to *ORNITHOGLOSSUM*. (See that article.) It consists of herbs, exactly resembling

the Cape species of *Melanthium*, especially in their *leaves* and *roots*. The *flowers* are sometimes dioecious, or polygamous. The claw of each *petal* is, in some instances, marked with a double gland. *A. indica*, in habit, colour of the *flowers*, the perfectly deciduous *corolla*, and perhaps the situation of the *embryo*, differs from the rest; can it be a distinct genus? *Brown*.

1. *A. dioica*. Dioecious *Anguillaria*. Br. n. 1.—“Flowers spiked, dioecious. Claws of the petals somewhat striped at the upper part.”—Observed by Mr. Brown, at Port Jackson, New South Wales, as well as in Van Diemen's island.

2. *A. biglandulosa*. Glandular *Anguillaria*. Br. n. 2.—Flowers united. Spikes few-flowered. Claws of the petals with two glands at the upper part.—Sent from Port Jackson, by Dr. John White, where also it was gathered by Mr. Brown. The stem is solitary, from four to six inches high, simple, round, bearing two distant, linear, smooth, recurved leaves; sheathings inflated, and broad at their base. *Spike* solitary, terminal, zigzag, of from three to five pale, perhaps yellowish, flowers, half an inch broad, each claw bearing a semi-lunar, glandular, prominent, dark-coloured glandular spot.

3. *A. uniflora*. Single-flowered *Anguillaria*. Br. n. 3.—“Stem single-flowered. Leaves lax, with hooded sheaths.”—Native of Van Diemen's island.

4. *A. indica*. Indian *Anguillaria*. Br. n. 4. (*Melanthium indicum*; Linn. Mant. 2. 226. Willd. Sp. Pl. v. 2. 268.)—Stem with few flowers. Partial stalks longer than the petals; the side-ones having a collateral leafy bractea. Leaves straight, with tight sheaths.—Native of Tranquebar and Pondicherry, as well as of the tropical part of New Holland. *Root* bulbous. *Stem* from six to ten inches high, simple, erect, smooth and slender. *Leaves* two or three, linear, taller than the stem. *Flowers* terminal, usually two or three, one much earlier than the others, on angular stalks, with lanceolate bractees various in size and number. *Petals* narrow, of a dark dull purple, as well as the *styles*, which are dilated and revolute. *Capsule* elliptical, crowned with the permanent *styles*.

ANGUIS, l. 9, dele which see respectively, and add—See SERPENTES.

ANGULOA, in *Botany*, named in honour of Francis de Angulo, a Spanish naturalist, of whom or his works we have no information.—“Ruiz et Pavon Prodr. Fl. Peruv. et Chil. 118. t. 26.” Swartz Orchid. in Schrad. Neues Journal, v. 1. 89.—Class and order, *Gynandria Monogynia*. Nat. Ord. *Orchideae*.

Gen. Ch. *Cal.* Perianth superior, reversed, of three ovate-lanceolate, concave, converging leaves. *Cor.* Petals two, resembling the calyx, but rather narrower. Nectary a lip shorter than the calyx, stalked, pitcher-shaped, somewhat bell-shaped, split longitudinally at the inner side, two-lobed; lobes rounded, reflexed at the margin; having in the notch in front a small, lanceolate, reflexed segment; in the posterior part another, tongue-shaped, concave, erect appendage. *Stam.* Anther a vertical, large, hemispherical, incumbent lid, pointed in front, of two cells, deciduous; masses of pollen two, globular. *Pist.* Germen inferior, cylindrical; style erect, gibbous, three-toothed at the top, the middle tooth with three points; stigma transverse, in front. *Peric.* Capsule with six angles, three of them larger than the rest, of one cell, and three valves. *Seeds* numerous.

Eff. Ch. Calyx reversed, converging. Petals rather narrower than the calyx-leaves. Lip stalked, pitcher-shaped, two-lobed, shorter than the calyx. Anther a deciduous lid.

1. *A. imiflora*. "Sfft; Veg. Peruv. et Chil. 228."—Native of Peru, about Muna, Tarma, and Chincao.

ANHYDRITE. See MINERALOGY, *Addenda*.

ANJENGO, l. ult. N. lat. 8° 39'. E. long. 76° 40'.

ANIGOZANTHUS, in *Botany*, perhaps from *anigozo*, to expand, or be apparent, and *anthos*, a flower, as the author commends its beauty.—Labillard. Voyage, Engl. ed. v. 1. 441. Gawler, nov. Ker, in Curt. Mag. v. 29. 1151. Brown Prodr. Nov. Holl. v. 1. 301. Ait. Hort. Kew. v. 2. 222.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Hemodoraceae*, Brown.

Gen. Ch. *Cal.* none, unless we take the corolla for such. *Cor.* of one petal, superior, tubular, externally clothed with compound hairs; tube curved, rather swelling upwards; limb in six deep, irregular, lanceolate, acute, unequal segments, much shorter than the tube, directed upwards; the two lowermost largest and most spreading. *Stam.* Filaments six, awl-shaped, inserted into the mouth of the tube, shorter than the limb, opposite to its segments, and having a similar direction; anthers linear-oblong, erect, bursting lengthwise in front. *Pist.* Germen inferior, oval; style thread-shaped, ascending, on a level with the filaments, deciduous; stigma undivided, tumid. *Peric.* Capsule nearly spherical, of three cells and three valves, crowned with the permanent corolla, bursting at the summit. *Seeds* numerous, angular, inserted into the inner angle of each cell.

Eff. Ch. Corolla superior, tubular, incurved; limb irregular, in six deep divisions. Stamens inserted into the throat, ascending. Seeds angular.

A genus of perennial herbs. *Root* of numerous thick fasciculated fibres. *Stem* unbranched, except at the top. *Leaves* sword-shaped, turned, half-sheathing at the base. *Flowers* somewhat corymbose, in short spikes (rather clusters) with a lanceolate bractea at the base of some of the partial stalks. *Brown*.

1. *A. rufa*. Reddish Anigozanthus. Labill. Voy. as above 441. t. 22. Nov. Holl. v. 2. 119. Brown n. 1.—"Stem permanently downy. Anthers pointless."—Native of Lewin's land, in dry sandy deserts, where it flowers in December. The stem is two feet or more in height, round, most downy in the upper part; somewhat leafy below. *Leaves* linear, acute, narrow, entire, finely striated. *Panicle* corymbose, downy. *Flowers* externally covered, like the whole of the panicle, with reddish, branched and tufted hairs. Their partial stalks are short. Labillardiere's figure represents the anthers with a point, but not an incurved one. Nothing is recorded concerning the colour of the inside of the flower. The filaments appear to be dilated at the base.

2. *A. flavida*. Russet-green Anigozanthus. Br. n. 2. Ait. n. 1. Redout. Liliac. t. 176. Curt. Mag. t. 1151. (*A. grandiflora*; Salis. Parad. t. 97.)—"Stem and leaves very smooth. Down of the panicle deciduous. Anthers with a little reflexed point."—Observed by Mr. Brown on the south-west coast of New Holland. We rely on that gentleman for the above specific characters; otherwise we should, like Mr. Ker, have scarcely considered these two plants as distinct. The present is said to have been sent to Kew by Mr. Good, in 1803. It was raised from seed, in Mr. Vere's garden, by Mr. Anderson, now of Chelsea, who found it required merely to be protected from frost, and flowered during most part of the summer. The leaves are sword-shaped, much broader than the foregoing. *Flowers*, according to Mr. Brown, smaller than in that species. They seem to be two inches long, externally green, covered with red, tufted, branched hairs, as well as their footstalks; inside of the limb smooth, dull purple. *Anthers* red on one side,

yellow on the other, not represented with so much of a point in the Botanical Magazine, as those of the first species in Labillardiere's figure. We have seen no specimens of either. M. Redouté has detected the same specific marks as Mr. Brown, and is the author of the above name. He had specimens of both from his friend Labillardiere, and on minute examination determined them to be most probably distinct. The flowers of *A. flavida* are smaller in his figure than in the Botanical Magazine.

ANIMAL FLOWER, l. ult. See CALENDULA.

ANISACANTHA, in *Botany*, Brown Prodr. Nov. Holl. v. 1. 410. See SCLEROZYMA.

ANISOMELES, from *anizo*, unequal, and probably *mda*, the cheeks, or parts surrounding the mouth, alluding to the great difference in shape and size between the upper and under lips of the corolla.—Brown Prodr. Nov. Holl. v. 1. 503. Ait. Hort. Kew. v. 3. 364.—Class and order, *Didymania Gymnospermia*. Nat. Ord. *Verticillata*, Linn. *Labiata*, Juss. Brown.

Eff. Ch. Calyx tubular, five-cleft, with ten furrows. Upper lip of the corolla smallest, undivided; lower three-cleft, middle segment two-lobed. Stamens prominent, ascending. Anthers of the shorter ones with two adjoining cells; often the longer ones halved, or dissimilar. Seeds smooth.

Downy herbaceous plants, growing within the tropics. *Leaves* crenate. *Flowers* whorled, with minute bractea. *Calyx* glandular. *Corolla* purple. The genus is akin to *Ajuga* and *Teucrium*, but sufficiently distinct from both one and the other. The upper lip of *Ajuga* is extremely short, and has a small central notch. Its anthers are observed by Mr. Brown to be uniform, kidney-shaped, of only one cell; and the seeds reticulated.

1. *A. mofchata*. Mucky Anisomeles.—Leaves elliptical, downy and hoary like the stem. Flowers few in each whorl. Calyx greyish, with conspicuous glands.—Gathered by Mr. Brown, as well as the two following species, in the tropical part of New Holland.

2. *A. inodora*. Scentless Anisomeles.—Leaves elliptical, nearly smooth; dotted beneath. Whorls remote. Calyx green, with conspicuous glands.

3. *A. falvifolia*. Sage-leaved Anisomeles.—Hoary and downy. Leaves lanceolate; soft and smooth above; rugged beneath. Whorls many-flowered. Glands of the calyx imbedded in soft down.

4. *A. ovata*. Broad-leaved Anisomeles. Brown in Ait. n. 1. (*Nepeta indica*; Linn. Sp. Pl. 799, excluding the synonyms. Willd. Sp. Pl. v. 3. 57. *Ballota disticha*; Linn. Mant. 83. Ait. ed. 1. v. 2. 304. Willd. Sp. Pl. v. 3. 108. *Marrubium odoratissimum*, botanice folio; Burm. Zeyl. 153. t. 71. f. 1.)—Leaves ovate, or somewhat heart-shaped, strongly crenate or serrated. Whorls many-flowered. Bractea linear. Calyx hairy; with scarcely visible glands.—Native of the East Indies, from whence it is said to have been imported by the first earl of Bute, in 1783. The plant has hardly perhaps been preserved in the stoves, being an annual, of no great beauty, however interesting to the curious botanist. The whole herb has a velvet-like softness, owing to its fine, short, soft, depressed hairs; its habit and size very like our *Ballota nigra*. The leaves sometimes very much resemble those of the common *Urtica dioica*, in size, shape, and serratures, but are often rather crenate than serrated. Whorls for the most part crowded into thick, partly leafy, spikes. Calyx very curiously reticulated with copious transverse veins; its teeth large, broad, pungent. The short upper lip of the corolla did not escape Linnæus, who founds thereon his specific character of this plant, as a *Nepeta*. His herbarium

herbarium proves Mr. Brown's suspicion to be correct, of *Ballota difflcha* being the same plant. The seeds well answer to the generic character of *Anisoteles*, being beautifully polished, elliptical, of a shining black.

These plants, at least the three New Holland species, seem most allied to *Teucrium Iva* and *salicifolium* of Linnæus, now removed to *Ajuga*. The musky odour of the first species is found in *Ajuga Iva*, whence a singular variety of that plant, with regular flowers, being taken by Forskall for a new genus, received the name of *MOSCHARIA*. (See that article.) The elliptical form of the leaves in *Anisoteles moschata*, rare in this natural order, agrees nearly with the Linnæan *Teucrium Laxmanni*, which is likewise an *Ajuga*. See *TEUCRIUM*.

ANISOPOGON, from *ανιστος*, unequal, and *πωγων*, a beard, alluding to the inequality and diffusibility of the awns.—Brown Prodr. Nov. Holl. v. 1. 176.—Clafs and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Eff. Ch. Calyx of two lax, membranous, ribbed, equal valves, single-flowered. Corolla italked, of two valves; outer cylindrically involute, three-awned at the top, the middle awn twisted, the lateral ones brittle-shaped; inner longer, unawned.

A. avenaceus. Oat-like Anisopogon.—Native of the neighbourhood of Port Jackson, New South Wales. A grass three feet high, resembling an *AVENA*. (See that article.) Stems unbranched. Leaves involute, with a fringed stipula. Panicle loose. Calyx-glumes large. The outer valve of the corolla is silky, connected with its awn by an obsolete joint. A small brittle, at the base of the inner valve, indicates this genus to be more strictly allied to *DANTHONIA*, (see that supplementary article), than to *ARISTIDA*, which latter the reader will find in its proper place.

ANKER. Add—An anker of brandy contains 10 gallons. It is also a liquid measure not only at Amsterdarn, but at Copenhagen, Hamburg, and other places. (See *VAT.*) At Copenhagen, a fuder of wine contains 2 pipes = 4 ox-hofts = 6 ahms; the ahm or tierce being = 4 ankers = 40 ftubgens = 77½ kannes = 155 pots = 620 pocles. A stucksfals is = 7½ ahms = 30 ankers: 32 pots hold the weight of a Danish cubic foot of water, each being 6½ Danish inches high, 3¼ ditto wide, and containing 64 cubic inches: 55 Danish pots, or 27½ Danish kannes = 14 English gallons, and an ahm = 39½ gallons nearly. The ahm at Hamburg is the sixth part of the fuder, and is = 4 ankers = 5 eimers = 20 viertels = 40 ftubgens = 160 quarters = 320 oeffels. See *MEASURE*.

ANN, QUEEN, in *Geography*, a county of Maryland, containing 16,648 inhabitants, of whom 6381 are slaves.

ANNA, a money of account in India. See *RUPÉE*.

ANNAPOLIS ROYAL, l. 13, for item *r.* item.

ANN-ARUNDEL, l. 4, *r.* 26,668; l. 5, *r.* 12,693.

ANNONA, in *Botany*, (see our former article,) is a name of barbarous origin, made into Latin by Linnæus, in allusion, as he tells us in *Hort. Cliff.* 222, to the value of the fruit, as yielding a grateful harvest or crop, *annona*, to the people where it grows. *Annona* is generally supposed to have been the original word, and is accordingly retained by the French school. But by Bauhin's *Pinax*, *Annona* appears to have full as authentic claims, on the score of priority, as *Anona*. The latter is moreover a Portuguese corruption of the original *Anon*, which Clusius taking from Oviedo, makes *Anon*, *Anonia*. *Anona*, *æ*, is very incorrect. We trust our learned friends in France will not insist on such an inaccuracy, any more than on their great countryman Plumier's name, *Guanabanus*, which they have commendably rejected, though of older authority than Linnæus or Jussieu.—Linn.

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Gen. 279. Schreb. 374. Willd. Sp. Pl. v. 2. 1264. Mart. Mill. Dict. v. 1. Ait. Hort. Kew. v. 3. 333. Juss. 283. De Cand. Syst. v. 1. 466. "Dunal Monogr. 58." Lamarck Dict. v. 2. 123. Illustr. t. 494. Gærtn. t. 138. (Guanabanus; Plum. Gen. 42. t. 10.)—Clafs and order, *Polyandria Polygynia*. Nat. Ord. *Coadunata*, Linn. *Anonæ*, Juss. *Anonacæ*, De Cand.

Eff. Ch. Calyx in three, more or less deep, concave, somewhat heart-shaped, sharpish lobes. Petals six, thickish, the three innermost smaller or wanting. Anthers numerous, nearly sessile, covering the receptacle; angular and dilated at the summit. Germens numerous, coalescing into a single sessile berry, whose coat is either tubercular, scaly, or reticulated, the internal substance pulpy, surrounded with numerous, single-seeded cells. De Candolle.

N.B. In our former article, line 12, read (or a compound berry, as in *Rubus*).

The species are trees or shrubs, whose bark is often reticulated, glandular, and aromatic. Leaves undivided, sometimes besprinkled with pellucid dots. Flower-stalks either axillary, or opposite to the leaves, often solitary, bearing one or more flowers, sometimes accompanied by small bractæas.

Obf. Very rarely the calyx has four lobes. The inner petals are occasionally imperfect.

Twenty-seven species are defined by De Candolle, but of these five are marked as imperfectly known. They are disposed in five sections, by the shape and consistence of their petals.

SECT. I. *Petals concave, thick, rather coriaceous, either heart-shaped or ovate*. Eleven species, subdivided as follows.

* Outer petals acute; inner ones obtuse, and rather smaller. Sp. 1—4.

** Outer petals obtuse. Sp. 5.

*** Petals all acute; inner ones rather the smallest. Sp. 6—11.

A concise view of the species will be sufficient, following the numbers of De Candolle.

1. *A. muricata*. (See *ANNONA n. 1.*) Linn. Sp. Pl. 756. Jacq. Obs. fasc. 1. 10. t. 5. (Zuurlack; Merian Surin. t. 14.)—Leaves ovato-lanceolate, smooth, somewhat shining. Stalks solitary, single-flowered. Outer petals heart-shaped, pointed; inner obtuse. Fruit armed with fleshy pointed tubercles.—Native of South America and the West Indies. The flowers are large, yellow. Fruit as big as a large pear, green or yellow, much esteemed.

2. *A. purpurea*. "Dunal Monogr. 64. t. 2."—Leaves nearly sessile, lanceolate; rather rusty beneath. Flowers axillary, almost sessile. Outer petals heart-shaped, acute; inner roundish.—Found in Mexico. Fruit unknown. Outer petals yellowish-brown; inner purple.

3. *A. Humboldtii*. "Ibid. 64. t. 3."—Leaves oblong, pointed, smooth, slightly dotted. Stalks axillary, solitary, short, single-flowered. Outer petals ovate, somewhat heart-shaped, acute; inner bluntish.—Found by Humboldt and Bonpland, in the South American province of Cumana. A shrub. Flowers yellowish, dotted with purple and red.

4. *A. laurifolia*. "Ibid. 65. (Anona, &c.; Catech. Carol. v. 2. t. 67.)"—Leaves ovato-lanceolate, smooth. Stalks solitary, single-flowered, drooping. Outer petals heart-shaped, acute; inner rounded. Fruit smooth, obovate.—Native of South America, and some parts of the West Indies. Outer petals large, green; inner white. Fruit green, shaped like an inverted pear.

5. *A. obtusiflora*. "Tussac Antill. t. 28. Dunal Monogr. 65."—Leaves oblong-lanceolate, wavy, pointed, copiously ribbed; the young ones downy. Stalks axillary, single-flowered.

flowered. Outer petals obtuse.—Cultivated in Hispaniola. *Fruit* roundish, tuberculated.

6. *A. palustris*. (See ANNONA n. 6.) Linn. Sp. Pl. 757. (*A. aquatica*, &c.; Sloane Jam. v. 2. 169. t. 228. f. 1.)—Leaves ovate-oblong, coriaceous, very smooth. Flowers solitary, stalked. All the petals acute. *Fruit* reticulated.—Native of the banks of rivers in South America and Jamaica.

7. *A. longifolia*. Aubl. Guian. 615. t. 248. Willd. n. 6.—Leaves oblong, taper-pointed, smooth. Flowers axillary, stalked. All the petals acute. *Fruit* ovate, nearly globular, dotted and reticulated.—Native of the borders of creeks in Guiana. *A shrub*, fifteen feet high. *Flowers* large, purplish. *Fruit* pulpy, gelatinous, and eatable.

8. *A. punctata*. Aubl. Guian. 614. t. 247. Willd. n. 7.—Leaves ovate-oblong, acute, smooth. Flowers axillary, solitary, nearly sessile. All the petals acute. *Fruit* nearly globular, slightly dotted.—Found by Aublet in the forests of Cayenne and Guiana. *A shrub* twenty feet high. *Flowers* small, yellowish. *Fruit* reddish, eatable.

9. *A. peruviana*. Dunal Monogr. 67.—Leaves elliptic-oblong, acute, rather coriaceous, slightly decurrent. Stalks axillary, bracteated. Petals all acute. *Fruit* globose, reticulated.—Found by Humboldt and Bonpland, in bogs about Guayaquil in Peru. *Flowers* yellow; three outer petals marked with a red spot, near the base on the inside. *Fruit* four inches in diameter, not eatable.

10. *A. Ambotay*. Aubl. Guian. 616. t. 249. Willd. n. 13.—Leaves elliptic-oblong, acute; clothed with rusty down beneath. Flowers axillary, solitary, nearly sessile. Petals acute.—Native of woods in Cayenne. *A shrub*, eight feet high. *Flowers* greenish, minute. *Fruit* not observed by Aublet, who alone seems to have seen this species, flowering in November.

11. *A. paludosa*. Aubl. Guian. 611. t. 246. Willd. n. 4.—Leaves oblong, acute; rather downy above; downy, silky, reddish, and ribbed beneath. Flowers on short stalks. Petals all acute. *Fruit* ovate, tuberculated.—Found by Aublet, in boggy meadows in Guiana, flowering in November, ripening its thickly tuberculated yellow fruit in April. The stem is shrubby, four or five feet high. Petals green, externally silky.

SECT. 2. Outer petals ovate, concave, acute, coriaceous; inner wanting. *Fruit* not well known, so that the plants of this section are referred to the present genus by their habit only. Two species.

12. *A. echinata*. “Dunal Monogr. 68. t. 4.”—Leaves ovate-lanceolate, rather acute; very smooth above; downy beneath. Branches rugged. Stalks solitary, single-flowered. Petals three. *Fruit* ovate, prickly.—Gathered by M. Patris, in Cayenne.

13. *A. ferrica*. “Ibid. 69. t. 5.”—Leaves ovate-oblong, pointed; smooth above; silky with rusty down, like the young branches, beneath. Flowers solitary, axillary, stalked; externally rusty. Petals three.—Found likewise in Cayenne, by M. Patris.

SECT. 3. Outer petals linear-oblong, narrow; triangular at the point; concave at the base only; often converging, so as to conceal the organs of impregnation; the inner ones extremely minute. Six species.

14. *A. squamosa*. (See ANNONA n. 3.) Linn. Sp. Pl. 757. Jacq. Obs. fasc. 1. 13. t. 6. f. 1. (Atamaram; Rheed Hort. Malab. v. 3. 21. t. 29.)—Leaves lanceolate, smooth; with pellucid dots. Outer petals somewhat converging. *Fruit* ovate, scaly.—Native perhaps of South America. De Candolle. Cultivated in both Indies, within the tropics. *A tree*, twenty feet high, with a spongy bark.

Flowers green externally, white within; foetid. *Fruit* eatable, of a pleasant taste, and fragrant scent, as big as a large apple; externally green, with tuberculated, scale-like protuberances.

15. *A. Forskahlii*. De Cand. n. 15. (*A. glabra*; Forfk. Ægypt.-Arab. 102. Ic. t. 15. *A. asiatica*; Vahl Symb. v. 3. 73. “var. β ”; Dunal Monogr. 71. *A. squamosa*; Delle Ægypt. 17.)—Leaves elliptic-oblong, smooth, dotted; glaucous beneath. Outer petals oblong, somewhat converging.—Gathered by Forskahl and by Coquebert in Egypt. Scarcely, in De Candolle’s opinion, distinct from *A. squamosa*, but the leaves are thinner and less pointed, more distinctly dotted.

16. *A. cinerea*. “Dunal Monogr. 71. t. 8.”—Leaves elliptic-oblong, almost lanceolate, dotted; downy beneath. Outer petals somewhat converging. *Fruit* ovate, nearly globular, scaly.—Gathered by Ledru in the island of St. Thomas, but perhaps not really wild. The young branches, leaves, stalks, and flowers, are clothed with greyish pubescence. *Flowers* stalked, two or three together. *Fruit* not unlike *A. squamosa*.

17. *A. Cherimolia*. Mill. Dict. ed. 8. n. 5. Lamarck Dict. v. 2. 124. (*A. tripetala*; Ait. n. 2. See ANNONA n. 2. Guanabarus Perseæ folio, flore intus albo, &c.; Feuill. Peruv. v. 3. 24. t. 17. Trewh. Ehret, 16. t. 49.)—Leaves ovate-lanceolate, without dots; very finely downy and silky beneath. Outer petals slightly converging; externally downy. *Fruit* nearly globular, somewhat scaly.—Native of Peru, or rather perhaps of some warmer country; for Feuillée speaks of this tree as cultivated there with great care, for the sake of its fruit, which is very wholesome, and much esteemed, though, he adds, one of our pears or plums is certainly worth all the Cherimolias of Peru. The tree is twenty to twenty-four feet high, with pendulous branches. *Flowers* pale green, with a crimson circle in the middle. *Fruit* heart-shaped, scaly and rough, the size of a small apple, being drawn too small in Ehret’s figure. De Candolle says there are three inner petals, though very minute.

18. *A. reticulata*. (See ANNONA n. 4.) Linn. Sp. Pl. 757. Willd. n. 5; excluding the syn. of Rumphius and Plumier. Jacq. Obs. fasc. 1. 14. t. 6. f. 2. (Anona-maran; Rheed Hort. Malab. v. 3. 23. t. 30, 31. Guanabarus fructu purpureo; Plum. Ic. 134. t. 143. f. 1; not 43. f. 2.)—Leaves oblong-lanceolate, acute, smooth, slightly dotted. Outer petals oblong, rather converging. *Fruit* ovate, nearly globular, tessellated like net-work.—Native of the West Indies, according to Browne and Sloane. Rheed speaks of it as only cultivated, not wild, in Malabar. A larger tree than *A. squamosa*, and with a more disagreeable scent. Petals brown underneath; yellowish-white above, dotted with purple at the base. *Fruit* the size of a large orange, but more ovate, of a shining yellowish or reddish brown, eatable. Professor De Candolle suspects that several species may be here confounded; and Dunal distinguishes the plant of Jacquin, from that of Rheed, by the reticulations of the fruit being somewhat pentagonal in the former, more rounded in the latter. Plumier’s seems still more different from both, in having the interstices very convex, each armed with a spine. Dombey appears to have gathered and preferred under this name, in Peru, a species distinguished by broader leaves, not marked with pellucid dots, but with more regular and prominent pinnate ribs. All these points can be cleared up by the acquisition of authentic specimens only, or by observations made on the spot. The history of the whole genus is as yet but a sketch, nor have European botanists materials to fill up the outline.

19. *A. mucosa*. (See ANNONA n. 19.) Jacq. Obs. fasc.

fasc. 1. 16. Aubl. Guian. 618. (Manoa; Rumph. Amboin. v. 1. 136. t. 45.)—Leaves oblong-lanceolate, smooth. Outer petals spreading at the extremity. Fruit tessellated, with gibbous interlicies.—Native of South America and some parts of the West Indies. Cultivated in the Molucca islands. This is said to differ from the last, in having the interlicies of the fruit tumid, (what then becomes of Plumier's t. 143. f. 1?) its pulp more slimy, and not agreeably flavoured. The leaves also are somewhat narrower.

Seet. 4. Outer petals elliptic-oblong, obtuse; inner smaller, lanceolate, bluntish. Calyx large, coriaceous, three-cleft, somewhat bell-shaped. Fruit conical, smooth? Three species.

20. *A. glabra*. (See ANNONA n. 8.) Linn. Sp. Pl. 758. Willd. n. 10. ("A. maxima, foliis latis, fructu maximo, luteo, conoide, cortice glabro; Catib. Car. v. 2. t. 64.")—Leaves ovato-lanceolate, smooth. Stalks two-flowered, opposite to the leaves. Fruit conical, obtuse, even.—Native of Carolina, according to Catesby. Cultivated perhaps in the West Indies. A tree sixteen feet high, with smooth leaves, much resembling those of a lemon-tree. Calyx reddish externally, of three broad, very short, often abrupt lobes. Petals six, nearly obovate, twice the length of the calyx.

21. *A. grandiflora*. Lamarck Dict. v. 2. 126. Willd. n. 17. "Dunal Monogr. 75. t. 6 and 6a."—Leaves ovato-lanceolate, smooth, coriaceous; & shining above. Stalks axillary, solitary. Fruit ovate, smooth, somewhat dotted.—Native of the Mauritius, and Madagascar. Leaves rather glaucous beneath. Calyx, and backs of the petals, finely downy. The inner petals are an inch long, being nearly equal to the outer. Fruit of a middling size, slightly rugged.

22. *A. amplexicaulis*. Lamarck Dict. v. 2. 127. Willd. n. 18. "Dunal Monogr. 76. t. 7."—Leaves oblong-heart-shaped, clasping the stem, acute, smooth. Stalks axillary, solitary, single-flowered.—Found by Commerçon in the isles of Mauritius and Madagascar. The leaves are sessile; glaucous or purplish beneath, at least when dry. Three inner petals rather the smallest.

Seet. 5. *Annona* not sufficiently known. Five species.

23. *A. asiatica*. (See ANNONA n. 9.)—Linn. Sp. Pl. 758. Willd. n. 12.—Leaves oblong, pointed, without dots; downy when young.—Native of Ceylon. Linnaeus. A specimen under this name is found in his herbarium, but there is no evidence of its being what he intended in his Fl. Zeyl. nor even in the first edition of Sp. Pl. There are neither flowers nor fruit, nor can we satisfy ourselves of this specimen being the same species as the botanists of Tranquebar send us for *A. asiatica*, which latter agrees best with *Squamosa*, n. 14.

24. *A. senegalensis*. "Perf. Ench. v. 2. 95. Dunal Monogr. 75."—Leaves broadly ovate, somewhat heart-shaped, coriaceous, smooth; glaucous beneath. Footstalks finely downy. Flower-stalks two or three together, lateral, between the leaves.—Native of Senegal and Guinea. Flowers small. Three outer petals ovate, obtuse, thick, thrice the length of the calyx.

25. *A. ? uniflora*. "Dunal Monogr. 76."—Leaves oblong, pointed, smooth; glaucous beneath. Flower-stalks downy, hoary, opposite to the leaves.—Native of Para, in Brazil. Young branches downy and hoary. Leaves nearly sessile. Flowers opposite to the uppermost leaf on each branch, with one or two orbicular leafy bractes. Calyx in three large, deep, ovate, coriaceous segments, externally hoary. The unexpanded petals appear similar thereto. A beautiful species, but the genus is doubtful. De Cand.

26. *A. ? exsucca*. "Dunal Monogr. 77."—Leaves ovate-

oblong, coriaceous, smooth, like the branches, on both sides; polished above. Flower-stalks simple or divided, nearly opposite to the leaves.—Gathered in the woods of Guiana, by Mr. Alexander Anderson, whose specimens were examined by professor De Candolle in Mr. Lambert's herbarium. A handsome tree, with a small, entirely dry, fruit. Branches smooth from the first. Leaves two and a half to four inches long. Petals three-lobed! This surely may well be deemed a doubtful *Annona*.

27. *A. africana*. (See ANNONA n. 10.) Linn. Sp. Pl. 758. Willd. n. 14; excluding the synonyms. (*A. foliis lanceolatis pubescentibus*; Linn. Hort. Cliff. 222.)—"Leaves lanceolate, downy."—This is recorded in the Hortus Clifortianus to have sprung up from African seeds. The "*habitat in America*" is therefore a gross and palpable slip of the pen, in the second edition of Sp. Pl., (it is *Aethiopia* in the first,) which the editors of Linnaeus's writings should have corrected; for such a contradiction of the specific name, might have induced some inquiry. Nothing appears for this species in the Linnaean herbarium. In Hort. Cliff. the branches are said to be rough with minute dots. Leaves ovate, but rather elongated; & downy, and in a manner hoary, on both sides, by no means polished.

For other plants which have been referred to *Annona*, see ORCHIDOCARPUM, ASIMINA, and MONODORA.

ANOMALY, col. 4. l. 15; for 122,441 r. 1,222,441. ANOMATHECA, in Botany, from *anomos*, out of rule, and *theca*, a case; because the capsule is distinguished by its papillary roughness, from all the rest of the plants of the same natural order, that have hitherto been examined.—Ker in Sims and Kon. Ann. of Bot. v. 1. 227. Dryand. in Ait. Hort. Kew. v. 1. 90.—Clafs and order, *Triandria Monogynia*. Nat. Ord. *Enstata*, Linn. *Irides*, Juss.

Gen. Ch. Cal. Sheath inferior, of two very small, elliptical, concave, leafy, nearly equal valves. Cor. of one petal, superior, falver-shaped; tube many times longer than the sheath, straight, nearly cylindrical, a little dilated at the mouth; limb not quite regular, in six, nearly equal, obovate, deep segments. Stam. Filaments three, inserted into the tube, thread-shaped, erect, much shorter than the limb; anthers vertical, oblong, converging. Pist. Germen roundish; style thread-shaped, about the length of the stamens; stigmas three, deeply divided, with linear, spreading segments. Peric. Capsule roundish-ovate, of three cells and three valves, its surface covered with small, papillary tubercles. Seeds numerous, round.

Eff. Ch. Sheath of two valves. Corolla falver-shaped. Stigmas three, deeply divided. Capsule minutely tuberculated.

1. *A. juncea*. Cut-leaved Anomatheca. Ker n. 1. Ait. n. 1. (Lapeyroufia juncea; Curt. Mag. t. 666. Gladiolus junceus; Linn. Suppl. 94. Thunb. Glad. n. 18. Cap. v. 1. 201, excluding the synonym of Jacquin! Redout. Liliac. t. 141. G. polytachius; Andr. Repof. t. 66.)—Found by Thunberg, in Lange Kloof, at the Cape of Good Hope, flowering from October to December. It flowers in May in our green-houses, where it is not uncommon, being easily propagated by offsets and by seed. The bulb is ovate. Leaves radical, equitant, sword-shaped, acute, dark-green, many-ribbed, with a deep flosing notch at their inner edge, from the base about half way up. Stalk a foot high, being twice as tall as the leaves, round, rather slender, branched, smooth, bearing many solitary, unilateral, slightly zigzag, spikes, of elegant, rose-colored, scentless flowers; the irregularity of whose corolla is evinced by the three lower segments being each marked with a deep red spot, and the middle one being moreover

white at the base. *Capsule* rough, with crowded, glandular, or papillary, protuberances. Mr. Ker conceives *Ixia excisa*, Linn. Suppl. 92, or at least one of its varieties, to be the same plant; but the specimens in the Linnean herbarium are surely different. They may indeed prove another species of *Anomatheca*, but this can only be ascertained by their *capsule*, which is wanting in all of them. *A. juncea* is certainly *Gladiolus amabilis* of Mr. Salisbury's Prodr. 41, (not 4,) as appears by a specimen from himself. He was the first author who noticed the peculiar roughness of the *capsule*, which he compares to the *fruit* of a *Caulis*. Few of the same natural order can be much more distinct than Jacquin's *G. floribundus*, Ic. Rar. t. 254, cited by Thunberg, with a faulty reference, in his *Fl. Capensis*.

ANONACEÆ, the fourth natural order of the *Dicotyledoneæ*, or *Exogena*, of De Candolle; separated by him from the *Coadunata* of Linneus, and answering to the *Anomæ* of Jusseu, being thus named after *Anona*, one of the chief genera. De Candolle thus defines the order.

Calyx of three lobes, very rarely of four. *Petals* six, in two rows, alternate with each other; the inner row sometimes wanting. *Stamens* indeterminate, unconnected. *Germens* indeterminate; very rarely solitary. *Fruit* compound, either separate or combined. *Seed* with internal processes, separating the portions of the albumen.

FRUCTIFICATION. *Calyx* inferior, short, permanent, more or less deeply three-cleft, very rarely with four lobes. *Petals* six, inferior, in a double row, alternate with each other, mostly coriaceous, and somewhat resembling an inner calyx, imbricated in the bud, though each row is valvular in that state; the inner one sometimes larger, sometimes smaller, rarely wanting. *Stamens* numerous, close-pressed, generally covering the hemispherical disk (or receptacle of the flower); filaments very short; anthers nearly sessile, with glandular, quadrangular, occasionally nectariferous points; their cells bursting longitudinally, externally, and downwards. *Germens* mostly numerous, crowded closely together, in some instances aggregate or combined, in others, though very rarely, and possibly from abortion, solitary. *Styles* one to each germen, short. *Fruits* as many as the germens, sessile or stalked, sometimes combined, either pulpy or capsular, with one or many seeds, which are ovate, or ovate-oblong, in one or two rows, inserted into the inner corner of each fruit. Their *skin* is brittle, membranous or crustaceous, having internal, sometimes plaited, processes, either flat or awl-shaped, insinuating themselves into the chinks or perforations of the albumen. The latter is fleshy, hard, shaped like the seed, very often bordered with a depressed furrow, accompanied by transverse plaits, or contiguous perforations. *Embryo* minute, situated in the umbilical region of the albumen. *Cotyledons* short. *Radicls* nearly cylindrical.

HABIT. Trees or shrubs, with round, often slightly two-ranked, branches, whose bark is mostly either reticulated, or warty; the young ones generally downy. *Leaves* alternate, connected with the stem by a joint, either sessile or with short footstalks, simple, almost always entire, or scarcely toothed, with pinnate veins; folded, and often downy, when young. *Stipulas* none. *Flower-stalks* mostly axillary, sometimes lateral, or opposite to the leaves, solitary, generally furnished with small bracts; they are shorter than the leaves, bearing one or many flowers, and not uncommonly twisted into a hook, some of the flowers being abortive.

QUALITIES. The roots, bark, leaves, and fruits, especially such as are capsular, are acrid, pungent, aromatic, and stimulating, often used for seasoning. Those fruits

which are of a fleshy nature are eatable, and esteemed in tropical climates.

HISTORY. The *Anonaceæ*, being all strangers to Europe, were unknown to the ancient botanists. Caspar Bauhin has scarcely indicated two species, Linnæus thirteen, Willdenow thirty-six, Perfoon forty-four; but Dunal in a most excellent treatise, almost literally followed by De Candolle, defines one hundred and five. Of these, five are natives of the temperate zone in America; forty-seven of the tropical regions of the same quarter of the globe; eight of equinoxial Africa; three of the Mauritius isles; twenty-six of India or its islands; six of China and Japan; two of New Holland; and there are six whose native country is uncertain.

AFFINITIES. This order agrees with the *Magnoliaceæ* of the same learned author, in having the parts of the flower disposed in a ternary order, anthers united to the filaments, numerous stamens and pistils; but differs very essentially (according to him) in having no stipulas, and differently shaped anthers as well as seeds. Some few climbing species make an advance towards the *Menispermæ*; but the indefinite stamens, and the structure of the fruit, afford a distinction. The *Anonaceæ* differ from all other polypteralous orders, with a superior germen, in the ternary structure of their flowers, as well as in the very peculiar insertion of the internal processes of the seed into its albumen. Such a structure was indeed found by Mr. Brown, in his *Eupomatia* (hereafter to be described in its proper place); a genus otherwise very different from the order before us.

The genera enumerated by De Candolle are, *Kadsura* of Jusseu; *Anona* of Linneus; *Monodora* of Dunal; *Affinia* of Adanson; *Porcelia* of Ruiz and Pavon; *Uvaria*, *Xylopia*, and *Unona* of Linnæus; and *Gutteria* of Ruiz and Pavon.

ANOPILOTHERIUM, in *Natural History*, an animal of an extinct genus, whose remains are found in a fossil state in the vicinity of Paris. It is so called by Cuvier, to denote that it was without weapons, having no canine teeth. In the natural system, this animal should be placed between the horse on one side, and the hippopotamus, the pig, and the camel on the other. The remains of five species of the anopliotherium have been discovered. The largest was the size of a small horse; the smallest not larger than a small rabbit. See STRATA in the *Vicinity of Paris*.

ANOPIPTERUS, in *Botany*, owes that appellation to Labillardiere, who meant to express the situation of the wing, at the upper part of the seed, the word being formed from *ανω*, upwards, and *πτερον*, a wing.—Labill. Nov. Holl. v. 1. 85. Brown Prodr. Nov. Holl. v. 1. 457.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Gentianeæ*, Juss. or perhaps *Ericæ*, according to Mr. Brown.

Gen. Ch. *Calyx* Perianth inferior, of one leaf, in six deep, acute, equal, spreading segments, permanent. *Cor.* of one petal, bell-shaped; tube very short; limb in six deep, equal, concave, obtuse, imbricated segments, much longer than the calyx. *Stam.* Filaments six, awl-shaped, smooth, equal, inserted into the tube of the corolla, opposite to each segment, and about half as long; anthers incumbent, heart-shaped, obtuse, two-lobed. *Pist.* Germen superior, ovate; style short, cylindrical, erect; stigma in two acute lobes. *Peric.* Capsule elliptic-oblong, of one cell and two valves. *Seeds* numerous, inserted into the margin of each valve, pendulous, imbricated, each crowned with an obovate, obtuse, membranous wing, thrice its own length.

Eff. Ch. *Calyx* in six segments, inferior, permanent. *Corolla* in six segments, with a very short tube. *Stigma* cloven.

cloven. Capsule of one cell and two valves. Seeds imbricated, pendulous, winged.

1. *A. glandulosa*. Glandular Anopterus. Labill. Nov. Holl. v. 1. 86. t. 112.—Native of Cape Van Diemen. An elegant slender tree, about thirty feet high, very smooth in every part. Leaves feathered; occasionally opposite, obovate-oblong, serrated, single-ribbed, coriaceous, about four inches long, rather bitter to the taste; tapering at the base; a black prominent gland on the inner edge of each ferrature. Clusters terminal, simple, half the length of the leaves, either solitary, or as many as four together. Corolla about the size and shape of *Pyrola rotundifolia*; of its colour nothing is recorded, Labillardiere's descriptions having been drawn up from his dried specimens after his return to Europe. Mr. Brown remarks, that the embryo is minute, nearly globose, enclosed in a fleshy albumen; the radicle superior.

ANRÉDERA, a name of which we find no explanation. Juss. Gen. 84. 448.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Holeraceae*, Linn. *Atriplicies*, Juss.

Ess. Ch. Calyx in two deep segments; keeled at the back. Corolla none. Style divided. Stigmas two. Seed clothed with the compressed, membranous, two-winged calyx, emarginate at the top and bottom.

1. *A. scandens*. Climbing Anredera. (*Fegopyrum scandens*, seu *Volubilis nigra major*, flore et fructu membranaceis, subrotundis, compressis;—Sloane Jam. v. 1. 138. t. 90. f. 1.)—Native of Jamaica, growing among trees near the ruins of a monastery by the town. Sloane. The stems are twining, round, red, succulent, climbing to the height of seven or eight feet. Leaves alternate, heart-shaped, or somewhat deltoid, succulent, smooth, entire, two inches and a quarter long, on footstalks half an inch in length. Clusters numerous, alternate, many-flowered, axillary and terminal. Flowers orbicular, compressed, green, bordered with a thin white membrane formed of the keel of each calyx-leaf. As the seed ripens, they turn brown. Sloane compares them to parsnip-seed. Swartz seems not to have noticed this plant. Its habit is nearly that of *Basella*.

ANTELOPE, col. 3, l. 7 from bottom, r. BUBALIS or CERVINE Antelope.

ANTHERYLIUM, in *Botany*, so named, either by Vahl or Von Rohr, apparently from *ανθηρα*, an anther, and *ωλον*, wood, or materials of any kind, in allusion to its numerous and conspicuous anthers.—Vahl in Mem. of the Nat. Hist. Soc. of Copenhagen, v. 2. 211. Willd. Sp. Pl. v. 2. 980.—Class and order, *Icosandria Monogynia*. Nat. Ord. *Hesperideae*, Linn. *Myrtis*, Juss.

Gen. Ch. Cal. Perianth of one leaf, inferior, in four deep, lanceolate, spreading, permanent segments. Cor. Petals four, inserted into the calyx between its segments, large, obovate, plaited and undulated, with short linear claws. Stam. Filaments numerous, from about thirteen to sixteen, capillary, inserted into the calyx, longer than the corolla, permanent; anthers incumbent, convoluted, furrowed. Pist. Germen superior, globose; style thread-shaped, very long; stigma capitate. Peric. Capsule globose, obscurely triangular, of one cell, and three, occasionally four, valves, bursting at the top and deciduous. Recept. globose, somewhat triangular, spongy, dotted with little hollows to receive the Seeds, which are numerous and minute.

Ess. Ch. Calyx inferior, in four deep permanent segments. Petals four, inserted into the calyx. Capsule of one cell and three valves. Seeds numerous.

1. *A. Roburii*. Flowery Antherylium. Vahl as above, 212. t. 8. Symb. v. 3. 66. Willd. n. 1.—Native of

the West Indian island of St. Thomas. Von Rohr, and West. A tree, with round, grey, scattered, scurred branches; leafy, and somewhat quadrangular, in their upper part. Leaves nearly opposite, stalked, ovate, acute, entire, two inches long, thin, very smooth, with one rib, and many transverse veins. There is a pair of stipulaceous prickles, at the base of each footstalk, which disappear from the older branches. Flower-stalks axillary from the insertion of the last year's leaves, from five to eight, fewer on one side of the branch than the other, hardly an inch long, simple, single-flowered, naked, thread-shaped. Capsule downy, the size of a currant. Nothing is recorded of the colour of the flowers, nor of the qualities or use of any part. The habit of the tree is compared by Vahl to the *Legnetis* of Swartz, to which genus he supposes this to be allied. He suspects also some affinity to Aublet's CRENÆA. See that article.

ANTHOBOLUS, we presume from *ανθος*, a flower, and *βολος*, a mass, or lump, the flowers forming little dense tufts.—Brown Prodr. Nov. Holl. v. 1. 357.—Class and order, *Diocia Triandria*. Nat. Ord. *Calyciflorae*, Linn. *Elaeagni*, Juss. *Santalaceae*, Brown.

Ess. Ch. Male, Calyx of three leaves. Corolla none. Stamina inserted into the base of the calyx-leaves.

Female, Calyx of three deciduous leaves. Corolla none. Stigma sessile, three-lobed. Drupa with one seed. Embryo inverted, in the axis of the fleshy albumen.

Akin to EXOCARPUS and OSYRIS. (See those articles.) The genus consists of smooth rushy shrubs, copiously branched, in habit resembling *Olyris*, the principal as well as the ultimate branches jointed at their insertion. Leaves scattered, sessile, articulated with the branch, narrow, nearly thread-shaped, destitute of stipules. Flower-stalks axillary; the male ones bearing each an umbel of three or four flowers; the female from one to three, jointed in the middle when simple, at the division when branched, and furnished at the joint with two deciduous bractæes. Flowers small, yellowish.

1. *A. filifolius*. Slender-leaved Anthobolus.—Leaves thread-shaped, lax, as well as the young branches.—Gathered by Mr. Brown, in the tropical part of New Holland.

2. *A. trigueter*. Awl-leaved Anthobolus.—Leaves awl-shaped, semi-cylindrical, moderately spreading. Branches angular, straight.—Found by sir Joseph Banks and Dr. Solander, in the same country. Brown.

ANTHOCERCIS, so named by Labillardiere, from *ανθος*, a flower, and *κερως*, a ray, the narrow divisions of the corolla spreading in a radiant manner, like the spokes of a wheel.—Labill. Nov. Holl. v. 2. 19. Brown Prodr. Nov. Holl. v. 1. 448. Ait. Hort. Kew. v. 4. 53.—Class and order, *Didynamia Angiospermia*. Nat. Ord. *Lurida*, Linn. *Solanaceae*, Juss. Brown.

Gen. Ch. Cal. Perianth inferior, of one leaf, cut half way down into five equal, erect, acute segments, permanent. Cor. of one petal, wheel-shaped; tube bell-shaped, contracted at the base, twice as long as the calyx; limb about as long as the tube, in five, sometimes seven or eight, very deep, equal, linear-lanceolate, spreading segments. Stam. Filaments four, with the rudiment of a fifth, inserted into the base of the tube, and not above half so long, awl-shaped, simple, smooth; anthers roundish, incumbent. Pist. Germen superior, oblong; style cylindrical, the length of the tube; stigma capitate, notched. Peric. Capsule ovate-oblong, of two cells and two valves, with inflexed edges, meeting the parallel partition. Seeds numerous, small, roundish, reticulated.

Ess. Ch. Calyx five-veft. Corolla wheel-shaped, regular, with a bell-shaped tube. Stigma capitate. Capsule of

two cells and two valves, with inflexed edges, and a parallel partition.

A shrubby smooth genus, whose habit announces an affinity to the *Solanæ*, but whose regular, deep-cut, radiating corolla, is altogether frange in the Linnæan class *Didymnia*. The leaves are alternate; tapering at the base, or somewhat stalked, articulated with the branch, thick, sometimes dotted with glands. Flowers axillary, nearly solitary, their stalks minutely bracteate, and mostly separating easily at the joint. Corolla white or yellow, handsome; its tube internally striated; limb in from five to eight segments.

1. *A. littorea*. Yellow Anthocercis. Labill. Nov. Holl. v. 2. 19. t. 158. Br. n. 1. Ait. n. 1.—Leaves obovate, without dots, smooth at the edges, as well as on both sides. Young branches smooth. Segments of the corolla longer than the tube. Capsule oblong, twice the length of the calyx.—Discovered by Labillardiere in Lewin's land; and observed in the same neighbourhood by Mr. Brown, and Mr. Good. The latter sent seeds to Kew in 1803. This is a greenhouse plant, flowering during most part of the summer. Mr. Aiton favoured us with a specimen in May 1811, when it first began to produce flowers. These are an inch in diameter, inodorous, pale lemon-coloured; the radiant segments of the limb narrow, taper-pointed; the tube striated internally with deep violet. Leaves about an inch long, abrupt or emarginate; nearly entire in our specimens. Labillardiere says they are sometimes toothed, or serrated.

2. *A. villosa*. Glutinous Anthocercis. Br. n. 2.—“Leaves obovate, marked with glandular dots; roughish at the edges; when young finely downy, as well as the young branches. Capsule ovate, about the length of the calyx.”—Native of the southern coast of New Holland. Brown. We have seen no specimen of this species, but from the above account, furnished by Mr. Brown, we presume its flowers to be white, and their limb not longer than the tube.

ANTHODON, a name which seems to allude to the toothed calyx and petals, is applied in the Flora Peruviana, v. 1. 45. t. 74. f. b, to a plant referred by professor Vahl to his *TONSELLA*; see that article, sp. 4th.

ANTHOLOMA. Labill. Voy. Engl. ed. v. 2. 245. t. 41. Nov. Holl. v. 2. 121, is certainly the same genus as *BASSIA*. (See that article.) Whether Labillardiere's plant may be the *obovata* of Forster, or a new species, we have no certain means of knowing.

ANTHOTIUM, from *antos*, a flower, and *thos*, a little ear, expressive of the auricles accompanying the upper segments of the corolla.—Brown Prodr. Nov. Holl. v. 1. 582.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Campanaceæ*, Linn. *Campanulacæ*, Juss. *Goodenovicæ*, Brown.

Gen. Ch. Cal. Perianth superior, in five deep equal segments, permanent. Cor. of one petal, longer than the calyx, irregular; tube slit at the back from top to bottom, and easily separable into five parts, with inflexed edges; limb two-lipped; upper lip in two, lower in three, deep segments, those of the upper lip having an ear-like appendage at their inner margin. Stam. Filaments five, shorter than the tube; anthers closely united into a tubular form. Pist. Germen inferior, oblong; style capillary, the length of the filaments; stigma large, obtuse, enveloped in a bivalve beardless cover, contrary to the lips of the corolla. Peric. Capsule of two cells. Seeds several.

Ess. Ch. Corolla of one petal, slit longitudinally at the back; limb two-lipped, its upper segments auricled at their inner margin. Anthers combined. Stigma with a bivalve beardless integument. Capsule inferior, of two cells.

1. *A. humile*. Dwarf Anthotium. Br. n. 1.—Native of the south coast of New Holland. A little smooth, stemless herb. Leaves radical, almost cylindrical, scarcely dilated at the base. Stalks several, spreading, undivided. Flowers collected in tufts, subtended by leafy bractææ. Corolla approaching to a violet colour. Pollen of simple grains. There are two varieties, one almost twice the size of the other, the parts of the flower somewhat differing also in their relative proportion. Brown.

ANTHRACITE. See *MINERALOGY*, *Addenda*.

ANTIARIS, in Botany, altered by Lefchenault from the name of the famous Poison-tree of Java, *Upas Antiar*, which that botanist calls *Antiaris toxicaria*, and which Mr. Brown considers as of the same genus with what we are about to describe from his excellent General Remarks, Geographical and Systematical, on the Botany of Terra Australis, p. 70; published at the end of the account of captain Flinders's Voyage, 1814.—Class and order, *Monocæcia Tetrandria*. Nat. Ord. *Scabridæ*, Linn. *Urticæ*, or *Urticæ*, Juss. Brown.

Gen. Ch. Male, Cal. Involucrum many-flowered; its margin in numerous, imbricated, lanceolate, acute, fringed, converging segments, at length expanded and reflexed; disk flat, covered with crowded sessile florets: perianth of four nearly spatulate, concave, equal, spreading leaves, converging at the extremity. Cor. none. Stam. Filaments scarcely any; anthers erect, converging, ovate, obtuse, two-celled, with white pollen. No rudiments of a pistil.

Female, Cal. Involucrum single-flowered, ovate, small, smooth, many-cleft at the summit, with lanceolate, fringed, converging, deciduous segments, some of them scattered over the body of the involucrum: perianth none. Cor. none. Stam. none. Pist. Germen in the body of the involucrum, oblong, single-seeded; style divided almost to the bottom, its segments thread-shaped, parallel, smooth, divaricated at the upper part; stigmas simple, acute. Peric. Drupa formed of the enlarged involucrum, oval, smooth, the size of a small plum, dark purple, internally fleshy and yellowish, containing a white milk. Seed. Nut pendulous, ovate, with a smooth, brown, tenacious crust; kernel without a skin; albumen none; embryo white, of two large, ovate, fleshy, almond-like cotyledons, flat on the inside, rather convex externally; radicle superior, very short.

Ess. Ch. Male, Involucrum many-flowered, many-cleft. Perianth of four leaves.

Female, Involucrum single-flowered, urceolate, many-cleft at the margin. Perianth none. Style deeply divided. Drupa from the enlarged involucrum. Seed without albumen. Radicle superior.

1. *A. macrophylla*. Brown as above, t. 5.—Found by Mr. Brown, in barren stony places, on the shores of the Company's islands, adjacent to Arnhem's land, on the north coast of New Holland, in about 12° south latitude, bearing flowers and ripe fruit in February 1803. *A. frub*, or very small tree, about six feet high, much branched, smooth, milky. Branches round. Leaves alternate, stalked, elliptic-oblong with a sharp point, entire, coriaceous, six inches long and three wide; unequal and slightly heart-shaped at the base; dark-green and shining above; more verdant beneath; with one rib, and many transverse parallel veins. Footstalks roundish, grey, half an inch long. Stipulas intrafollicleous, lanceolate, pointed, folded, leafy. Flower-stalks axillary, solitary, racemose, scarcely longer than the footstalks, each bearing six or eight alternate flowers, of which one or two of the lowest are female, and earlier than the rest, which are all male.

We presume the *A. toxicaria* of Lefchenault, *Annales du Mus.* y. 16. 478. t. 22, is another species of the same genus; but

but we are not informed of the specific characters of either. Of that celebrated Poison-tree the first satisfactory account, according to Mr. Brown, is there given, which differs from his description above, merely in some particulars relative to the male flowers. He adds that *Antiaris* should stand in the *Urticeæ*, between *Brosimum* of Swartz, and *Olmedia* of the Flora Peruviana, agreeing with the latter in the structure of its male flowers, and more nearly resembling the former in its female flowers and fruit.

ANTIMONY, in *Chemistry*. Several important additions have been lately made to our knowledge respecting this metal and its compounds, which we shall briefly notice here.

In describing this metal, we stated that Haüy had been unable to ascertain its primitive crystalline form. This indefatigable observer has at length, however, determined that the primitive form of its crystal is an octahedron, and that its integrant particles have the figure of tetrahedrons. The specific gravity of antimony, according to Hatchett, is 6.712. It melts at a low red heat, or about 810° of Fahrenheit; and after this, if the heat be raised, the metal evaporates.

The oxys of antimony have been lately investigated with great care by Thenard, Proust, Bucholz, and Berzelius. According to Thenard, this metal forms no less than six oxys; according to Proust and Bucholz, it forms only two; while according to Berzelius, it forms four. These discordances arise from the great difficulty of the investigation. The protoxyd of Berzelius is obtained by exposing antimony to the air, or to the action of a galvanic battery. It is a grey powder. When acted upon by muriatic acid, it is separated into the protoxyd of Proust and metallic antimony. Hence Dr. Thomson remarks it is only a mixture of the two. The two oxys of Proust are easily obtained, and possess specific characters. Berzelius has shewn that the second of them possesses the properties of an acid. The peroxyd of Berzelius is also readily obtained, though it is difficult to free it from water. This likewise possesses the properties of an acid. Hence, says Dr. Thomson, we know three oxys of antimony. The grey protoxyd, the white antimonious acid, and the straw-yellow antimonic acid.

The following is the composition of the protoxyd of antimony according to

	Proust.	Berzelius.	Thomson.
Antimony	100	100	100
Oxygen	22.7	18.6	17.775

Antimonious acid is composed, according to the same chemists, of

	100	100	100
Antimony	100	100	100
Oxygen	29.87	24.8	23.7

And antimonic acid of

	—	100	100
Antimony	—	100	100
Oxygen	—	37.2	35.556

The above results of Berzelius and Thomson are rather obtained by calculation than actual experiment, being founded on the supposed composition of sulphuret of antimony, which, according to Berzelius, is composed of 100 antimony and 37 sulphur, and according to Thomson, of 100 antimony and only 35.572 sulphur.

While such discordances exist respecting the composition of the oxys of antimony, it is impossible to fix with certainty the weight of its atom. Dr. Thomson, however, it may be proper to state, considers it as 56.25.

The two oxys of antimony, denominated above the antimonious and antimonic acids, are capable, according to Berzelius, of combining with different bases and forming two

sets of salts, the first of which may be termed *antimonites*, the second *antimoniates*.

The following is the method of preparing the *antimonium tartarizatum*, or tartrate of antimony and potash, according to the last edition of the London Pharmacopœia.

Take sulphuret of antimony pounded, two ounces; nitrate of potash, one ounce; supertartarate of potash, two ounces; sulphuric acid by weight, two ounces; distilled water, a pint and a half. Mix the acid with half a pint of water in a proper glass vessel, and place it in a sand-bath. When moderately heated add by degrees the sulphuret and nitre previously well mixed together; and then apply heat till the whole of the water is driven off. Wash the remainder with distilled water until it comes off tasteless, and while the mass is yet moist mix it with the supertartarate of potash. To this mixture add a pint of distilled water. Boil the mixture, and when filtered put it aside to crystallize.

ANTONIUS LIBERALIS, in *Biography*, a Greek writer of an uncertain age, known as the author of *Μεταμορφωσεων Συναγωγης*, or a Collection of Metamorphoses, published at Basil, in 8vo., by Xylander, in 1568; at Leyden, in 12mo., by Berkelius, in 1674; by Munkeras, at Amsterdams, in 1676; and by Gale, at Paris, 1675, 8vo. This writer is not the same with a Latin rhetorician, mentioned by Jerom. Fab. Bib. Græc.

ANYCHIA, in *Botany, so called by Michaux, on account of its affinity to **PARONYCHIA**. (See that article.) This plant therefore has as little concern with the finger nail, *ωνυχία*, as the other has with a whitlow.—Michaux Boreal.-Amer. v. 1. 112. Pursh 176. St. Hilaire Paron. 98. (Queria; Gærtn. t. 128.)—Class and order, *Pentandria Monogynia*, Nat. Ord. *Holeraceæ*, Linn. *Anaranthi*, Juss. *Paronychie*, Juss. Ann. du Mus. St. Hilaire.*

Gen. Ch. Cal. Perianth inferior, of one leaf, oblong, in five deep, oblong segments, slightly hooded at the extremity, with a posterior point. Cor. none. Stam. Filaments five, sometimes fewer, shorter than the calyx, opposite to each segment and inserted into its base, bristle-shaped, erect, distinct, without any intermediate processes; anthers nearly heart-shaped. Peric. Germen superior, roundish; style one, very short; stigmas two, oblong, recurved. Peric. Capsule roundish, membranous, of one cell and one valve, covered by the calyx, with an orbicular depression at the summit, pointed, separating at length irregularly at the lower part. Seed one, nearly kidney-shaped, smooth, attached by a lateral thread to the base of the pericarp.

Ess. Ch. Calyx inferior, in five deep, converging segments, hooded at the summit. Stigmas two. Capsule membranous, of one valve. Seed solitary.

This is a genus of diminutive herbs, with opposite leaves, attended by stipules. Flowers minute, in leafy tufts, each of them sessile, with bractæes like the stipules. Michaux.

1. *A. dichotoma*. Forked Anychia. Michaux n. 1. Pursh n. 1. (*QUERIA canadensis*; see that article, n. 2.)—Stem forked, much branched, spreading. Leaves elliptic-lanceolate, smooth, erect. Bractæes about as long as the smooth calyx.—On dry lime-stone hills, from New York to Kentucky, flowering from June to August. Perennial. Flowers exceedingly small; very variable in the number of stamens, generally from two to five. Pursh; who quotes Ortega's Dec. t. 15. f. 2, a work not in our possession. The root has all the appearance of being annual, as professor Schrader found it in the garden of Gottingen.

2. *A. bernardioides*. Rupture-wort Anychia. Michaux n. 2. Pursh n. 2.—Stem diffuse, densely branched, downy all over. Leaves elliptic-oblong, fringed, bristle-pointed. Segments of the calyx awl-shaped, with bristle spreading points.³⁷

points."—Found by Michaux, on the dry sands of North Carolina. Perennial. Purfl did not meet with this species.

3. *A. argyrocoma*. Silvery-headed *Anychia*. Michaux n. 3. Purfl n. 3.—Procumbent, tufted. Stems minutely downy. Leaves linear, acute, rather hairy. Flowers in terminal tufted heads, with membranous bractæes. Segments of the calyx hairy, with long bearded points.—On rocks in Upper Carolina, and Virginia. Perennial, flowering in June and July. *Purfl*. Michaux compares the habit of this plant to that of *Illecebrum Paronychia*, doubtless on account of its large silvery bractæes.

AORTA, in *Surgery*. As professor Scarpa observes, the whole body may be regarded as an anastomosis of vessels,—a vascular circle,—and the remark is so true, that even an obliteration of the aorta itself may happen, immediately below its arch, without the general circulation of the blood in the body being stopped. Meckel met with two cases in which the aorta was thickened and considerably constricted just below its arch; yet in both subjects there was every reason to believe, that the abdominal viscera and lower extremities had been duly supplied with blood. This fluid, which could only pass from the heart with great difficulty; and in small quantities, had, by regurgitating, lacerated the semi-lunar valves. (Mém. de l'Acad. Royale de Berlin, 1756, obs. 17 and 18.) A like example is recorded by Stoerk. Ann. Med. vol. xi. p. 171.

We have a very interesting case of obstructed aorta related by Monsieur Paris, formerly dissector for the Amphitheatre of the Hôtel-Dieu. He injected the body of a very lean old woman, about fifty years of age, whose arterial system was found to be singularly deranged, and the circle of the blood altogether changed by a complete contraction of the aorta a little beyond the arch. The attention of M. Paris was particularly excited to the condition of this subject by the unaccountable enlargement of the small arteries upon the forepart of the chest. The injection which was employed entered the mouth of the aorta so readily, that, so far was he from suspecting any obliteration of this vessel, he could have thrown in more injection than is usually required for filling an adult body. The subject was so meagre, that, without dissecting, M. Paris felt the thoracic arteries running down the sides of the chest tortuous and remarkably enlarged. On dissection, he found the aorta immediately beyond its arch contracted to the size of a writing quill; the coats of the artery were of their usual thickness, and its cavity of course extremely small; the arch of the aorta above this contraction was but very slightly dilated; the part below had lost nothing of its natural size.

The carotids were in the natural state; the arteria innominata and the left subclavian were enlarged to twice their natural diameter; all their smaller branches were increased in the same proportion, and had assumed a curled and zigzag course. The internal mammary and phrenic arteries were greatly enlarged, and very tortuous. The transverse arteries of the neck were of twice their natural size; their posterior branches were tortuous, extending to a great distance over the back, with long inosculations, which were met from below by the branches of the upper intercostal arteries, which were also remarkably enlarged. The thoracic and scapular arteries which run along the side of the chest were twice their natural size.

Below the constricted part of the aorta the lower intercostals were much enlarged, even to three or four times their natural size. Each of them was dilated; but those were most affected which were given off nearest the contracted part; and the posterior branch of each, which penetrates to the muscles of the back, was more dilated than that which

runs between the ribs. Indeed those posterior branches were so remarkably dilated with contortions so closely succeeding each other, that they resembled a necklace of beads; and their inosculations with the branches of the transverse cervicis were very remarkable. The lower phrenic artery was enlarged, forming considerable inosculations with the superior phrenic. The epigastric artery was dilated to the size of the enlarged mammary, and was joined with it by very numerous and conspicuous inosculations. *Deault's Parisian Chir. Journ. tom. ii. p. 107, &c.*

In the body of a male subject, two steatomatous tumours were found by Stenzel, situated in the substance of the membranes of the aorta immediately below its arch. Notwithstanding these swellings rendered the vessel nearly imperious, the man had the appearance of strength, and of having been well nourished. "Hæc corpora ferè cor magnitudine æquabant ut omnem propemodum exenti à finitri cordis thalamo languini spatium præcluderent." *Diff. de Steatomatibus Aortæ.*

Dr. Graham, of Glasgow, has very recently published a still more remarkable case, in which the circulation was carried on for a considerable time through the anastomoses, notwithstanding a complete obstruction of a part of the aorta. The patient was a lad fourteen years old, who, in consequence of exposure to cold, was affected at first with a dry cough, followed by copious expectoration, pain, and difficulty of respiration. The disease was supposed to be pneumonia in an advanced stage. Dyspnoea, palpitations, and pain of the left side, were also the most remarkable symptoms at a later period. The pulse became weak, but was always regular to the very last. The boy at length died, after remaining in the Glasgow Infirmary about five months. On dissection, together with other morbid changes, the walls of the left ventricle of the heart were found about an inch in thickness; but no other derangement in the structure of the heart, or its valves, was observed. The aorta was unusually expanded near its origin, so as to form a kind of pouch; but, after having given off the branches to the head and superior extremities, its diameter was preternaturally contracted. It continued of this diminished size till after its union with the canalis arteriosus, when it became completely imperious. The coats were not thickened, nor in any way diseased, except that about half an inch below the stricture there was a smooth elevation on the inner surface, less raised, but having nearly the diameter of a split-pea. In other respects, the appearance was exactly such as would result from tying a ligature round the artery.

The artery then received three trunks, about as large as crow-quills, and near them three smaller ones, when it resumed its natural size along the vertebrae. The three trunks were evidently the uppermost of the inferior intercostals, the coats of which were remarkably thin, like those of veins. A probe passed from the pulmonary artery along the canalis arteriosus to the obstructed portion of the aorta; but from the thickened appearance of that canal, and the firm countenance of the boy during life, probably there had been little communication allowed by means of it between the aorta and pulmonary artery. Dr. Graham, it appears, did not inject the subject, so as to demonstrate all the exact channels by which the circulation had been carried on; but he tells us, that the arteria innominata, the left subclavian, the superior intercostals, and the mammary arteries, were much enlarged. The epigastric was reported to be of its natural size. "These facts, and the aorta acquiring at least very nearly its natural size immediately below the stricture, shew that the blood did not pass to the inferior extremities in any material quantity, as might perhaps have been expected by the inosculations of

AORTA.

the mammary and epigastric arteries; but chiefly by the communications of the superior intercostals and the mammary arteries with the three large branches entering the aorta below the fricature; and of the mammary and thoracic arteries with the diaphragmatic and other intercostals. See *Medico-Chir. Transf.* vol. v.

If the aorta were obliterated, or obstructed in the abdomen, the blood would find adequate channels for its transmission in the mammary and epigastric, the superior and inferior mesenteric, and the lumbar arteries. Mr. A. Cooper informs us, that he has never met with any instance of the latter description in the human subject. (*Surgical Essays*, part i. p. 113.) But he has several times applied ligatures to the aorta in dogs, and found that the blood was readily carried by anastomosing vessels to the posterior extremities of the animal. (See *Medico-Chir. Transf.* vol. ii. p. 249, &c.) The incision was in each experiment made on the left side of the spine; the aorta was drawn to the surface of the skin by an aneurism needle, and being quite separated from other parts was tied. The animals were then kept for a few weeks, and then killed. They were afterwards injected and dissected, when it appeared that the lumbar arteries were considerably enlarged, so as to be the chief agents of the new circulation.

In those diseases causing obstruction of the thoracic aorta a little beyond its arch, to which we have requested the reader's attention, no doubt the change was the result of a very gradual process, and consequently, the altered course of the blood through the collateral channels would also be established, not all at once, but by degrees. The anastomosing arteries would only enlarge, in proportion as the obstruction in the great artery increased. But in the experiment of tying the aorta in animals things were very different; for the stoppage of the passage of the blood through the tied portion of that vessel was not only effected instantaneously, but also completely, so that the whole office of transmitting the blood to parts beyond the obstruction suddenly devolved altogether to the anastomoses, which had had no time for any gradual and preparatory dilatation. Yet notwithstanding this seeming disadvantage, we find that the blood did pass into the posterior extremities.

The aorta of the human subject, however, has now been tied in the human subject by Mr. A. Cooper, and the following are a few of the particulars of the case. The patient, who was thirty-eight years of age, had on the left side an inguinal aneurism, which had actually burst, and discharged a quantity of blood sufficient to reduce the man to a state of considerable weakness. Another hemorrhage would have carried him off. It was apprehended, that the tumour extended too high up to admit of a ligature being applied to the external iliac artery itself; yet in the hope of being able to dispense with such measures as would be necessary to tie the aorta near its bifurcation, Mr. A. Cooper resolved to try whether it were possible to tie the aneurismal artery itself. He made, therefore, a small incision into the aneurism, about two inches above Poupart's ligament; but he found only a chaos of broken coagula, and that the artery entered the sac above and quitted it below without there being any intervening portion of vessel. The operation was consequently abandoned. "When I was about to withdraw my finger," says Mr. A. Cooper, "I directed two of the students to compress with their hands the aorta upon the spine, and they succeeded in stopping the pulsation in the artery of the right groin. As I withdrew my finger, I put a doil of lint by its side, and closed the opening which I had made into the sac." *Surgical Essays*, part i. p. 118.

The only other chance of preservation was what might

result from tying the aorta itself; and it was determined to adopt the proceeding, bold and unprecedented as it was in respect to the human subject. A doubtful remedy is always better than none. This ancient maxim in surgery seems to gather strength in proportion to its duration, and is a short but an effectual answer to every attempt which has been made by the ignorant and malicious to throw blame on the distinguished surgeon, whose ardent desire to save the life of an individual was the main-spring of his conduct. Mr. A. Cooper, after enjoining the prudence of emptying the bowels previously to any other similar operation, states, that he made an incision three inches long into the linea alba, giving it a slight curve to the left side to avoid the umbilicus. One inch and a half of the cut was above and the remainder below the navel. He then made a small aperture into the peritoneum, and introduced his finger into the abdomen. This opening was enlarged with a probe-pointed bistoury to nearly the same extent as that of the external wound. During the progress of the operation, only one small convolution of intestine projected beyond the wound. The operator next passed his finger between the intestines down to the spine, where he felt the aorta beating with excessive force. By means of his finger-nail, he scratched through the peritoneum on the left side of the aorta; and next gently and gradually passing the finger between that vessel and the spine, again penetrated the peritoneum on the right side of the aorta. Guided by the same finger, he now conveyed a blunt aneurismal needle, armed with a single ligature, behind the vessel. After the ligature had been placed, much care was requisite to exclude the intestine from it in drawing it into a noose. The operation being finished, the wound was closed with a quill-suture and adhesive plaster.

During the operation the fæces passed off involuntarily, and the pulse, both immediately and for an hour after the operation, was 144 in a minute. An opiate was given, and the involuntary discharge of fæces soon ceased. When the right thigh was touched, the patient thought it was the foot, so that the sensibility of that extremity was very imperfect.

The operation had been performed about nine in the evening. At one o'clock the following morning, the lower extremities, which had become cold soon after the operation, were beginning to get warm again, but their sensibility continued yet indistinct. At eight o'clock, the right leg was warmer than the left, and the sensibility was returning. At noon, the temperature of the right limb was 94; that of the left, or aneurismal limb, 87½. At six o'clock in the evening, the temperature of the right was 96, that of the left 87½. At nine the same evening, the pulse was 104 and feeble, with vomiting, restlessness, and an involuntary discharge of fæces. At eleven, the pulse was 100 and feeble, and the vomiting still continued. At eight the next morning, the aneurismal limb appeared livid and felt cold, more particularly around the aneurism; but the right leg remained warm. At eleven the pulse was 120, and the patient seemed to be sinking. In fact, he died eighteen minutes after one in the afternoon, having survived the operation forty hours. On dissection, no appearance of peritoneal inflammation was found, except at the edges of the wound. The omentum and intestines were free from any unnatural colour. The ligature which had not included any portion of bowels was placed round the aorta about three-quarters of an inch above its bifurcation, and about an inch below the part where the duodenum lies across it. In the aorta a coagulum more than an inch in extent was found to have sealed the vessel above the ligature. Below the bifurcation, other similar coagula were found in the right and left iliac arteries. By the fall to which the patient had ascribed the

tumour, the neck of the thigh-bone had been broken within the capsule, and it was still in a difunited state. Mr. A. Cooper imputes the man's death not to inflammation, but to the want of circulation in the aneurifimal limb, occasioned in a great measure by the immense size of the tumour, and the disturbed state of the coagula which it contained. He conceives, therefore, that, in any future case of this kind, the ligature should be applied before the swelling has become very large. Surgical Essays, part i.

One thing seems proved by this memorable case, viz. that the circulation in the lower extremities may continue notwithstanding a sudden ligature on the aorta. Here it did so in the right leg, and probably would have done so in the left, had it not been for the obstruction arising on that side from the magnitude of the tumour.

AOTUS, in *Botany*, so named by the writer of this article, from *α, without*, and *ωτος, an ear*; because it is essentially distinguished from PULTENEA, (see that article,) by the want of the two ear-like appendages to its calyx, not to mention other marks hereafter indicated.—Sm. in Sims and König's Ann. of Bot. v. 1. 504. Brown in Ait. Hort. Kew. v. 3. 14.—Clafs and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceae*, Linn. *Leguminosae*, Juff.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, bell-shaped, two-lipped, without appendages; upper lip of two divaricated, acute segments; lower of three rather longer, more direct ones. *Cor.* papilionaceous, of five petals; standard inwardly heart-shaped, ascending, with a linear claw of its own length; wings obovate-oblong, shorter than the standard, each with an abrupt angle at the upper edge where it joins the claw; keel as long as the wings, obtuse, of two obovate-oblong, ascending petals, each with a similar tooth. *Stam.* Filaments ten, separate, awl-shaped, ascending, nearly equal, smooth, deciduous; anthers oval, of two cells. *Pist.* Germen roundish, with the rudiments of two seeds; style thread-shaped, parallel to the stamens, but rather longer, twisted after impregnation, stigma simple, bluntish. *Peric.* Legume nearly orbicular, acute, of one cell and two concave firm valves. *Seeds* two, elliptical, inserted into the middle of the upper margin of each valve, without any crest or appendage.

Eff. Ch. Calyx simple, five-cleft, two-lipped. Corolla papilionaceous; wings shorter than the standard. Stamens deciduous. Style thread-shaped. Stigma obtuse. Legume of one cell, and two valves. Seeds two, without a crest.

Aotus is very nearly allied to *Pultenea*, and had previously been confounded therewith, but besides the want of appendages to the calyx, and of a *strophobolium*, or crest, to the seeds, which last difference was first noted by Mr. Brown, the style is not awl-shaped, but almost capillary, variously twisted as soon as the flower falls, rather swelling upwards, and the stigma is obtuse. The habit of the plant is also very distinct, having nothing like the chaffy aspect of a *Pultenea*; there are neither bractees nor stipulas; the leaves are partly opposite, and almost whorled. Mr. Brown, by giving a specific character to this shrub in Hort. Kew. leads us to presume that he has found other species of the same genus; for he is not one of those botanists who make a distinction without a difference. We are however acquainted with the following only.

1. *A. villosa*. Hairy Aotus. Sm. n. 1. Tr. of Linn. Soc. v. 9. 249. Ait. n. 1. Curt. Mag. t. 949. (*A. ferruginea*; Labill. Nov. Holl. v. 1. 104. t. 132. *Pultenea villosa*; Andr. Repof. t. 309, but not of Willd. Sp. Pl. v. 2. 507. *P. ericoides*; Venten. Malmf. t. 35.)—Calyx silky, with close hairs. Legume stalked. Seeds rough with minute dots. Leaves rough on the upper side. *Brown*.

—Native of New Holland, and Van Diemen's island. Sent by Sir J. Banks, in 1790, to Kew garden, where it flowers in the green-house, from April to June. The stem is three feet high, with numerous, round, silky, leafy branches. Leaves scattered, or imperfectly whorled, on short hairy stalks, spreading, linear, revolute, entire, a half or three-quarters of an inch long; channelled, and rough with minute points, above; silky beneath. Flowers bright-yellow, axillary, on short, silky, rusty stalks, two or three together, numerously crowded about the tops of the branches, so as to form leafy clusters. Legume very hairy, two lines long. The standard of each flower is marked with radiating crimson lines, as in the *Dilwynia*.

APARGIA, Schreb. Gen. 527. Willd. Sp. Pl. v. 3. 1547. See THURNCIA, at the end of which is given the history of this genus.

APERTO, Ital., in *Musci*, open, opposed to *chiuso*, closed.

APHELANDRA, in *Botany*, a genus first proposed by Mr. Brown, in a note to his Prodromus, to be separated from JUSTICIA. (See that article.) The name he has given it is composed of *αφελος, simple*, and *ανδρ, a male*, expressing the simple structure, or single cell, of the anthers, one of the most distinguishing characters of this genus.—Brown Prodr. Nov. Holl. v. 1. 475, obs. Ait. Hort. Kew. v. 4. 55.—Clafs and order, *Didynamia Angiosperma*. Nat. Ord. *Personate*, Linn. *Acanthi*, Juff. *Acanthaceae*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in five deep, oblong, unequal, erect segments. *Cor.* of one petal, ringent; tube much longer than the calyx, incurved, angular, gradually swelling upwards; limb in two unequal acute lips; the upper erect, cleft; lower revolute, undivided. *Stam.* Filaments four, awl-shaped, simple, erect, inserted into the tube of the corolla, and rather shorter than its upper lip, parallel, slightly curved, two of them a little the longest; anthers incumbent, attached by the back, oblong, acute at each end, hairy behind, of one cell. *Pist.* Germen superior, ovate; style thread-shaped, the length of the stamens; stigma simple. *Peric.* Capsule oblong, tapering at the base, of two cells and two elastic compressed valves, the partition contrary to, and fixed in the middle of, each. Seeds two in each cell, roundish, each subtended by a spinous process.

Eff. Ch. Calyx in five deep unequal segments. Corolla ringent; lower lip undivided. Anthers single-celled. Capsule of two elastic valves and two cells; with contrary partitions. Seeds subtended by spines.

1. *A. cristata*. Dense-spiked Aphelandra. Brown in Ait. n. 1. (*Justicia cristata*; Jacq. Hort. Schoenbr. v. 3. 38. t. 320. *J. tetragona*; Vahl Symb. v. 3. 5. Enum. v. 1. 118. Willd. Sp. Pl. v. 1. 85. *Ruellia cristata*; Andr. Repof. t. 506.)—Leaves elliptic-oblong, pointed, smooth on both sides, with hairy veins beneath. Bractees ovate, entire. Corolla smooth.—Native of Cayenne and the Caraccas, flowering in the stove throughout August and September. It appears to have been first brought to England by the late earl of Seaforth, and flowered at Mr. Lambert's in Wiltshire. The stem is shrubby, three feet high, or more, with opposite, round, smooth branches. Leaves opposite, stalked, broadly elliptical, acute at each end, somewhat wavy, dark green, plant, five or six inches long, and three broad; smooth above, with a reddish mid-rib, and many fine veins; the rib and veins only, according to Jacquin, downy beneath. Flowers scarlet, large, splendid, and extremely numerous, forming dense quadrangular spikes, about a span long, branched at the base, with close, ovate, green, or brownish, fringed, single-flowered bractees. The

corolla:

corolla is full two inches in length. This plant is so very nearly allied in habit, foliage, colour of the flowers, and their general appearance, to the magnificent *Justicia coccinea*, Sm. Ic. Pict. t. 8, that one would think they must belong to one and the same genus. But on examination, the three-lobed lower lip, two-lobed anthers, and leafy bractæas of the latter, indicate a technical, as well as natural, distinction.

2. *A. pulcherrima*. Downy-leaved Aphelandra. (*Justicia pulcherrima*; Jacq. Amer. 6. t. 2. f. 4. Coll. v. 3. (not v. 5.) 252. Ic. Rar. t. 204. Linn. Suppl. 84. *Herb. Linn.* Willd. Sp. Pl. v. 1. 86. Vahl Symp. v. 2. 14. Enum. v. 1. 119. J. arborea; Mill. Dict. ed. 8. n. 7. J. putata; Loefl. It. 244.)—Leaves elliptic-oblong, pointed; smooth above; finely downy beneath. Bractæas ovate, entire. Corolla smooth.—Native of South America, flowering in February. *Loefling*. Houttoun appears to have sent seeds to Miller, who cultivated this species before the year 1753. Mutis communicated a specimen to Linnaeus, which we see no reason to distinguish from Jacquin's plant, notwithstanding what is recorded in the *Supplementum*, of the *stamens* being two only; for we find four in the flower we have examined, bearing the proper simple anthers of an *Aphelandra*. How far the complete hoary downiness of the backs of the leaves, and the smaller spikes, with less copious flowers, may prove the present species distinct from the foregoing, we greatly doubt. Mr. Brown in Hort. Kew. unites them, without marking this as even a variety of *crisitata*.

3. *A. scabra*. Rough-leaved Aphelandra. (*Justicia scabra*; Vahl Enum. v. 1. 120.)—"Leaves elliptic-oblong, acute; rough on the upper side. Bractæas oblong, acute, hairy."—Native of South America. Leaves three inches long, acute at each end; rough above with prominent points; veins somewhat downy beneath. Vahl speaks of this as very nearly related to the last; but as Mr. Brown, who had doubtless examined specimens, enumerates it in his *Prodromus* as distinct, and does not subsequently unite more than the two first together, we presume it must be different, and that the *corolla* is not smooth, nor the bractæas entire, both which characters he makes discriminative of the *crisitata*, and they certainly exist likewise in the *pulcherrima*.

APHELIA, apparently so called from ἀφελῆν, simple, in allusion to the great simplicity of parts and structure in the flower.—Brown Prodr. Nov. Holl. v. 1. 251.—Class and order, *Monandria Monogynia*. Nat. Ord. *Resiitaceæ*, Brown.

Gen. Ch. *Cal.* Sheath of several imbricated, two-ranked, single-flowered, pointed, hispid scales; the lower ones sometimes barren, and longer than the rest. *Cor.* of one membranous valve, at the inner side of each flower. *Stam.* Filament one, capillary; anther simple. *Pistil.* Germen superior, single-seeded; style one, thread-shaped; stigma solitary, undivided. *Peric.* Capsule membranous, of one valve, and one cell, bursting longitudinally at one side. *Seed* solitary.

Eff. Ch. Scales two-ranked, single-flowered. Corolla of one valve, interior. Anther simple. Stigma one. Capsule bursting longitudinally, at one side. *Seed* solitary.

Obs. This genus is closely allied to DEVAUXIA of Mr. Brown, which will be described in its proper place hereafter, and from which *Aphelia* differs in having a simple pistil, two-ranked spike, and only one valve to the corolla, situated at the inner side of the flower. The only known species is

1. *A. cyperoides*. Cyperus-spiked *Aphelia*.—Discovered by Mr. Brown, in the southern part of New Holland. A small, tufted, grassy herb, resembling some of the lesser kinds of *Scirpus* and *Cyperus*. Root fibrous. Leaves radical,

thread-shaped, sheathing at the base. *Stalks* leafless, thread-shaped, undivided. *Spike* terminal, solitary.

APHRITE. See SCHAUM Earth.

APPARITION. Subjoin at the close of the article,

In the year 1805, Dr. Alderferon of Hull read to the literary society of that place, and published in 1811, "An Essay on Apparitions," designed to prove, that the immediate cause of these spectral visitations lies not in the perturbed spirits of the departed, but in the diseased organization of the living. In 1813 Dr. Ferrier of Manchester published, on a more extended scale, "An Essay towards a Theory of Apparitions," similar in result to the anterior production of Dr. Alderferon. Both admit the reality and universality of spectral impressions, and both attribute them to partial affections of the brain, independent of any sensible and external agency. These and other such writers, who consider the appearances of ghosts, &c. as the immediate effect of certain partial but morbid affections of the brain, confine themselves to physical phenomena, professedly discarding the consideration of any higher efficiency in the series of causation, than what appears to be the result of diseased organization; so that their discovery, though completely overturning the common superstition as to the return of the departed spirit, or the invisible interference of angelic agency, is yet, says Dr. Drake, in the learned volume of his "Shakspere and his Times," very reconcilable with the pneumatology of bishop Horley, who conceives that the Deity often acts immediately through his agents on the human sensory, as a part of the material universe, thereby producing disease and morbid impressions. (See Horley's Nine Sermons on the Nature of the Evidence by which the Fact of our Lord's Resurrection is established.) Our Lord, according to the bishop, after his resurrection, was no longer in a state to be naturally visible to any man. His body indeed was risen, but it was become that body which St. Paul describes in the 15th chapter of his 1st Epistle to the Corinthians; which, having no sympathy with the gross bodies of this earthly sphere, nor any place among them, must be indiscernible to human organs, till they shall have undergone the similar refinement. Accordingly it is alleged, that we are told by St. John, that the body of our Saviour, after his resurrection, could only be seen through the operation of a miracle. "Him God raised up the third day," and "gave him to be visible." "Et dedit eum manifestum fieri." Vulgate.

APPRECIATION, l. 2. from bottom, r. abbé Feytaud for Feyer.

APRILE GUISEPPA, in *Biography*. See TENDUCCI.

AQUILEGIA, in *Botany*, (see our former article). The history of this elegant genus is greatly enriched by professor De Candolle, who reckons up thirteen species. The following references require to be added.—Willd. Sp. Pl. v. 2. 1245. Mart. Mill. Dict. v. 1. Ait. Hort. Kew. v. 3. 325. Sm. Fl. Brit. 578. Prodr. Fl. Græc. Sibth. v. 1. 372. Pursh 372. De Cand. Syst. v. 1. 333. Tourn. t. 242. Lamarck Dict. v. 1. 149. Illustr. t. 488.

Eff. Ch. Calyx none. Petals five, deciduous. Nectaries five, gaping and two-lipped at the summit; outer lip large and flat; inner minute; each extended downwards into a hollow spur, callous at the point, projecting between the petals. Stamens numerous, disposed in five or ten parcels, the inner ones abortive, their filaments dilated, membranous, and oblong, destitute of anthers. Germens five. Capsules as many, erect, many-seeded, beaked with the styles. *De Candolle*.

We here, of course, alter the phraseology of our author, with respect to the parts of the flower, as in ACONTIUM.

AQUILEGIA.

These are perennial herbs, with fibrous roots. *Radical*, or lower *stem-leaves*, on long three-cleft *footstalks*, divided in a twice-ternate manner; their *leaflets* three-cleft, toothed, mostly obtuse: *upper leaves* cut, or deeply divided, into linear lobes. *Flowers* terminal, blue, white, rose-coloured, or purple, very rarely of a dirty yellow. To which we may add that the *flowers* are pendulous, *fruit* erect.

The *herbage* is slightly bitter, tonic or somewhat astringent, scarcely acrid. *Seeds* acrid, recommended in eruptive disorders.

The various species inhabit mountainous thickets and pastures of the northern hemisphere; one is found in America, four in different parts of Europe, seven in Siberia.

Obf. The scales, originating in the dilatation of the innermost *filaments*, and the abortion of their *anthers*, often surround the *germens* like *bractæas*, after the *flower* is past. They are delineated in several of Barrelier's plates. Mr. Brown has remarked something analogous in the petal-like scales of his EUPOMATIA; see that article hereafter. The flowers in *Aquilegia* become double in four different ways. 1. Those termed *corniculati* have accessory *nectaries*, originating from changed *stamens*, all spurred and pointing downwards. 2. *Inversif* have their *spurs* turned upwards, in consequence of a twist in the claws of those parts. 3. *Stellati* have accessory *nectaries* proceeding from enlarged *stamens* deprived of *anthers*; such being all flat, and without *spurs*. 4. *Degeneres* have all their *stamens*, *pistils*, and *nectaries* obliterated, nothing remaining but multiplied *petals* (*sepala* of De Candolle) of a greenish hue.

We shall follow our author, in a compendious review of the species, with some necessary alterations. They are not separated into sections.

1. *A. vulgaris*. (See AQUILEGIA, n. 2.) Common Columbine. Linn. Sp. Pl. 752. Willd. n. 2. Fl. Brit. n. 1. Engl. Bot. t. 297. Fl. Dan. t. 695. (Aquilegia; Trag. Hist. 137. Fuchf. Hist. 102. A. cœrulea; Ger. Em. 1093, with figures likewise of the several varieties above-mentioned. Aquilina; Matth. Valgr. v. 1. 577. Camer. Epit. 404. varieties, 405. Ioppyrum Diofcoridis; Column. Phytob. t. t. 1.)—*Nectaries* incurved. *Capules* hairy. *Stem* leafy, many-flowered. *Leaves* nearly smooth. *Styles* not overtopping the *stamens*.—Native of rather moist meadows, woods and thickets, throughout Europe, from Sweden to Greece, flowering in July. Thunberg also found this plant in Japan. Baron Marschall von Bieberstein mentions it as occurring, though rarely, in the Iberian tract of Caucasus. Nothing is more common, or more hardy, in gardens; its fanciful varieties being tolerably constant from seed, as far as they produce any. The root is rather tuberous. *Herb* smooth, two or three feet high. *Leaves* glaucous beneath. *Flowers* somewhat paniced, pale violet in a natural state, occasionally pink or white, larger and handsomer than in any of their garden deformities. The *alpina* of Hudson, different from the real one, is a rather smaller, more slender, mountain variety, with tapering, less incurved, *nectaries*. We have gathered it at Matlock, Derbyshire.

2. *A. viscosa*. (See AQUILEGIA, n. 1.) Linn. Mant. 77. Willd. n. 1. Ait. n. 1. Gouan Illustr. 33. t. 19. "De Cand. Fr. ed. 3. v. 4. 912. v. 5. 640. (A. hirsuta, flore viscoso; Magn. Monsp. 26. Hort. 21. A. montana, flore parvo, thalictri folio; Bauh. Pin. 144. Prodr. 75. Lachenal Act. Helvet. v. 8. 146. t. 5. Bauh. Hist. v. 3. 484. Morif. sect. 12. t. 1. f. 5, bad.)—*Nectaries* incurved. *Capules* hairy. *Stem* with very few flowers, almost naked, downy and viscid as well as the leaves and flowers. *Styles* not overtopping the *stamens*.—Native of Switzerland, the

fourth of France, and all along the rocky hills of the Mediterranean. De Candolle concurs with Villars in opinion, that this plant is only a variety of the foregoing. We have never compared them in a living state, but the singular viscidous moisture which covers the whole herb, especially the *flowers*, and is visible even in dried specimens, seems to indicate an essential difference. The *flowers* too are larger, while the plant is smaller, sometimes single-flowered, and the *leaflets*, with their segments, are more wedge-shaped. Linnæus however declares, Syst. Veg. ed. 13. 420, that seeds of the *viscosa*, from Gouan himself, produced the *vulgaris*.

3. *A. speciosa*. Handsome-flowered Columbine. De Cand. n. 3, excluding the synonyms. (A. vulgaris, daurica; Willd. n. 2, 9?)—*Nectaries* incurved; spur the length of the border. *Capules* hairy. *Stem* leafy, many-flowered. *Flower-stalks*, *footstalks*, and backs of the leaves, downy. *Styles* taller than the *stamens*.—Native..... Seen in a cultivated state by De Candolle, flowering in May and June. He doubts whether his plant were distinct from *A. vulgaris*, as it differed only in the spur and limb of each *nectary* being of equal length, the former generally yellow at the extremity, and the *styles* rising above the *stamens* during the flowering. Fischer and Perloou, it seems, have mentioned a variety, in which the *spurs* are of the same colour as the limb. Whatever their plant may be, we are satisfied that the synonyms of Aiton and Ehrhart belong to the following.

4. *A. sibirica*. Siberian Party-coloured Columbine. Lamarck n. 4. De Cand. n. 4. (A. vulgaris, speciosa; Ait. n. 2, 8. Willd. n. 2, 7. A. bicolor; Ehrh. Beitr. v. 7. 146. A. hybrida; Sims in Curt. Mag. t. 1221? De Cand. n. 11?)—*Nectaries* incurved. *Germs* and *capules* perfectly smooth. *Styles* taller than the *stamens*.—Native of Siberia. Linnæus cultivated this plant, and found it did not alter. We received it in 1796, from the garden of Messrs. Lee and Kennedy, at Hammermith, who had the seeds from that country. Specimens of the same, in the Linnean herbarium, are marked as having been gathered near Irkutsk. M. De Candolle justly describes "the radical leaves on long stalks, smooth, except perhaps some downiness on the *footstalks*; their segments obtuse, broadly notched. *Stem* hardly a foot high, mostly single-flowered, and entirely naked; sometimes bearing two or three *flowers*, with one or two leafy *bractæas*. *Sepala* (*petals*) blue, oval, obtuse. *Nectaries* white, half as long, very blunt. *Capules* quite smooth, by which character this species is readily distinguished from all the foregoing, and perhaps from all the rest." De Cand. Our wild specimens have three or four *flowers* on each stem, and the garden ones are still more luxuriant. The *flowers* in both are purplish-blue, the lips of the *nectaries* cream-coloured, as expressed in Ehrhart's name, and Dr. Sims's figure. We should have no hesitation about his synonym, were it not for the slight downiness which he attributes to the herbage. The proportion of his *styles* is right, but he does not say any thing of the *germens*. We cannot but suspect the gardeners mixed seeds of the Siberian species with the Canada one, or possibly that pollen of the latter might have had some effect on the flowers of the former, of which the rather less curved *nectaries* of the offspring seem an indication; the pale hue of their limb is exactly that of our *sibirica*. The downy leaves do not accord with either. If we are right, De Candolle's *hybrida*, n. 11, must be expunged. Respecting Gmelin's *A. n. 16*, Fl. Sib. v. 4. 185, we suppose by its last synonym, alluding to the party-coloured *nectaries*,

nectaries, it must have been what we have just described, taken by him for the Linnæan *alpina*, though not without some doubt.

5. *A. alpina*. (See *AQUILEGIA*, n. 3.) Alpine Columbine. Linn. Sp. Pl. 752. Willd. n. 3. Ait. n. 3. Ehrh. Beitr. v. 7. 146. Sm. Tour. ed. 2. v. 3. 137. Allion. Pedem. v. 2. 64. t. 66. (A. n. 1196; Hall. Hist. v. 2. 89. *A. montana*, magno flore; Bauh. Pin. 144. Prodr. 75. Bauh. Hist. v. 3. 484.)—Lips of the nectaries half as long as the elliptic-lanceolate pointed petals; spurs curved at the extremity. Stem two or three-flowered, leafy. Leaflets with many deep, linear-wedge-shaped, segments. Capules downy, corrugated.—Native of bushy alpine situations in Switzerland, Savoy, Mount Cenis, &c. flowering in July or August; but not, we believe, of Siberia, the variety β of De Candolle appearing to belong to the last species. The real *A. alpina* is the most magnificent of its genus, distinguished by fine blue flowers; spreading two and a half or three inches, and well represented in Allion's plate. The herbage is smooth. Stem often above two feet high, bearing several flowers. The *germens* are densely downy. Capules near an inch long, finely hairy, transversely wrinkled, with copious, prominent, parallel, confluent veins. Seeds black and shining, numerous. Miller might have cultivated this noble plant at Chelsea, but it had long been lost, and was restored by seeds from Mount Cenis, in 1787, being now probably again extinct in England.

6. *A. pyrenaica*. Pyrenean Columbine. "De Cand. Fr. ed. 3. v. 5. 640." (*A. alpina*; Lamarck n. 3.)—"Spurs of the nectaries quite straight, scarcely shorter than the limb. Stem nearly naked, mostly single-flowered. Leaflets with numerous, deep, linear lobes."—Found in elevated rocky pastures, among the Pyrenees and Apennines. Akin to the last, but in all its parts but half as large. Leaves on longer stalks, their outline nearly circular. Flowers one or two, middle-sized, blue. Petals (*sepala*, De C.) oval, tapering at each end. Spurs slender, perfectly straight to the very point. Stem and footstalks either quite smooth, or slightly hairy. Some synonyms of *A. viscosa* are repeated under this species by De Candolle, at least those of the Bauhins and their followers. We have seen no specimen, and can form no opinion. There seems some confusion in our able friend De Candolle's specific characters of this and the last. The spur in *A. alpina* is half the length of its real petals, as Linnæus says; De Candolle says half the length of the limb of his petals, our nectaries, which is not the case, those parts being of equal length, as is nearly the case with *A. pyrenaica*. But in this latter perhaps the petals, his *sepala*, are no longer. This point is material.

5. *A. canadensis*. (See *AQUILEGIA*, n. 4.) Canadian Columbine. Linn. Sp. Pl. 752. Willd. n. 4. Ait. n. 4. Curt. Mag. t. 246. Pursh n. 1. Bigelow. Bost. 133. (*A. pumila præcox canadensis*; Cornut. Canad. 59. t. 60. Mill. Ic. t. 47. *A. canadensis*, flore externè rubricundo, medio luteo; Morif. sect. 12. t. 2. f. 4.)—Spurs straight. Styles and itamens prominent. Petals acute, rather longer than the limb of the nectaries. Leaflets deeply three-lobed, bluntish, notched.—In the crevices of rocks, from Canada to Carolina, flowering in April and May. Pursh. A hardy perennial in our gardens, distinguished by the beauty of its scarlet flowers, variegated with yellow, remarkable for their long, straight, erect spurs. The *germens* are downy, with very long and slender styles.

8. *A. viridiflora*. (See *AQUILEGIA*, n. 5.) Green-flowered Columbine. "Pallas Ag. Petrop. for 1779. 260. t. 11." Willd. n. 5. Ait. n. 5. Jacq. Ic. Rar. t. 102.—Spurs straight, longer than the limb of each nectary. Sta-

mens the length of the nectaries. Styles much longer. Petals elliptic-oblong, shorter than the nectaries.—Found in Siberia by Pallas, who sent seeds to Kew in 1780. The green flowers, and long spurs, mark this species. *Germens* downy, encompassed by membranous abortive *flamens*, after the perfect ones are gone.

9. *A. daourica*. Daourian Columbine. De Cand. n. 9.—Spurs straight, shorter than the limb of each nectary, *flamens* scarcely prominent. Styles much longer. Petals acute, shorter than the nectaries.—On the Daourian mountains, flowering in June. This resembles the preceding and the following species, differing from the former in having dark purple flowers, the spur of whose nectaries is shorter than their limb, and their *flamens* a little prominent; from the latter in having very prominent styles, and petals shorter than the limb of the nectaries. De Cand.

10. *A. atro-purpurea*. Dark Violet Columbine. Willd. Enum. 577. De Cand. n. 10. (*A. viridiflora* β ; Willd. n. 5.)—Spurs straight, the length of the limb. Styles and itamens scarcely equal to the petals, which are the length of the limb of the nectaries.—Native of Siberia, according to Willdenow, from whom this species is entirely adopted. The flowers are described as dark purple, or blueish-violet; the limb of each nectary greenish-blue; spur blueish-violet. Professor De Candolle suspects this may be the same plant as Dr. Sims's *hybrida*, (see *Sibirica*, n. 4.) which is not at all improbable, and if so, we lose another out of his thirteen species. The only difficulty is to conceive, that Willdenow could, at any time, reckon this *hybrida* a variety of *viridiflora*, to which his *atro-purpurea* was reduced in his Sp. Pl.

11. *A. parviflora*. Small-flowered Columbine. De Cand. n. 12. (*A. fylvarum humilis*; Gmel. Sib. v. 4. 186. n. 17. t. 74.)—Spurs straight, short, nearly as long as the obtuse limb of each nectary. Stamens and pistils recurved, the length of the petals. Stem smooth, as well as the leaves.—Very frequent in woods about the river Lena. Gmelin. Herb entirely smooth, except the bristly *germens*. Stem a foot, or rather more, in height, bearing from two to seven flowers. Leaflets ovate-wedge-shaped, with three broad obtuse teeth at the end. Bractæes in linear segments. Flowers blue or violet, much smaller than those of *A. canadensis*; their spurs, (according to De Candolle, who had examined dried specimens,) straight, very short; Gmelin terms them "spiral." Petals ovate, acute, tapering at the base, longer than the blunt limb of the nectaries. Stamens, as well as styles, curved downwards; barren filaments oblong-linear, much crisped at the edges.

12. *A. anemonoides*. Anemone Columbine. "Willd. Geff. Naturf. Berl. Mag. for 1811. 401. t. 9. f. 6." De Cand. n. 13.—Spurs straight, very short, as long as the limb, which is one-third the length of the petals. Stalks radical, single-flowered, nearly naked.—Native of the Altaian region of Siberia. Root perennial. Herb three inches high, smooth, resembling *Anemone triternata*. Leaves radical, divided in a thrice-ternate manner, with oblong segments, either entire, or two or three-lobed. Stalks scarcely longer than the leaves, accompanied by two linear-lanceolate bractæes. Petals ovate, obtuse. Nectaries five, hooded; their spurs gibbous at the base. Willd.

ARACÆI, l. 10, r. Baanh.

ARACCA, l. 5, r. Erach.

ARALIE, in Botany, so named from its principal genus, a natural order of plants, the 59th in Jussieu's series, the 1st of his 12th class. We have given the character of that class under the article *UMBELLATÆ*. The *Araliæ* are thus defined.

Calyx either entire or toothed at the margin. Petals and *flamens*

filaments definite. *Styles* and *stigmas* several. *Fruit* pulpy, or rarely capsular, of as many cells as there are styles, with a solitary seed in each. *Stem* either arboreous, or shrubby, or herbaceous. *Leaves* alternate, often compound, their footstalk sheathing in its lower part. *Flowers* umbellate, either with an involucre, or, more rarely, naked.

The genera are, *Gaflonia* of Commerlon; *Polycias* of Forster nearly related thereto; *Aralia* of all authors; *Cuffylonia* of Linnæus in his Supplementum; and *Panax*.

The *Aralias* are naturally allied to the *Umbellatae*, but differ in having their seeds in a pericarp, instead of being naked. They are akin to *Cornus* and *Hedera*, but distinguished by having more than one style. *Juff*.

ARANEA, col. 2, l. 10, *dele* which see respectively, and insert, See SPIDER.

ARAUQU, in *Geography*, a river of Georgia, next in importance to the Cyrus, or Kur, which, rising near the gates of Caucasus, flows to the south, and after dividing into two equal parts, the southern range of mount Caucasus, falls into the Kur, at the town of Tigette, 25 miles above Teflis.

ARASCHA, a rapid river of Mingrelia, which has its source near the village of Kemme, and unites, on the borders of the Iberian lordship of Sa Schulo, with the Hippus, which rises in the highest mountains of the Soani, not far from the source of the Phafis, flows through Letsghumi, divides Mingrelia from Iberia, and enters the Phafis, near the Tredia.

ARATUM, *r.* ARATRUM.

ARAUCARIA, in *Botany*, a barbarous name, given by Juffieu to the Chili Pine, which Lamarck, Schreber, and Lambert, have called DOMBEYA. (See that article.) Willdenow has unfortunately retained the above name, because he had already ignorantly followed Cavanilles in calling a genus *Dombeya*, which is not generically distinct from *Pentapetes*. Hence *Araucaria* has found its way into Mr. Aiton's *Hortus Kewensis*, where Willdenow is taken as the leading authority, and DOMBEY's ill fortune still pursues him. (See our biographical account of that eminent man, which we trust will be our sufficient justification in always maintaining the genus which he introduced, and which properly belongs to him: nor have we any doubt that our learned countrymen will concur in supporting his well-earned fame, when they properly consider the subject.) We have further to observe, that the *Dombeya* of Lamarck, or that of Cavanilles, has, neither of them, any preference as to date, both having, we believe, been first announced in Juffieu's *Gen. Pl.* in 1789, a year before the date of publication of each of those authors' works. We are also ready to allow that our illustrious friend Juffieu, in the choice he made, was far from concurring in the base persecution of *Dombey*, originally raised by the Spaniards. He was however evidently aware that the *Dombeya* he adopted could hardly be maintained, or at least that it was not distinct from *Pentapetes bœniacea*, now received as PENTAPETES. (See that article.) *Araucaria* is not, as has been reported, the denomination of the Chili Pine, in any part of the world, but a perversion of that of its native country, the Araucanian mountains, and to such generic names there are many objections.

ARAUJIA, so named by professor Brotero, in honour of a Portuguese nobleman, Don Antonio de Araujo, an eminent patron of botanical science.—Brot. Tr. of Linn. Soc. v. 12. 62.—Class and order, *Pentandria Digynia*. Nat. Ord. *Corticeæ*, Linn. *Apocineæ*, Juss. *Ajclepiadoeæ*, Brown.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, in five deep, ovate, permanent segments. *Cor.* of one petal, bell-shaped; tube rather longer than the calyx, inflated at the

base, with five protuberances; limb in five deep, ovate, acute segments, shorter than the tube, slightly spreading, their points somewhat recurved and twisted. Nectaries five cells in the base of the tube, opposite to the segments of the limb. *Stam.* Filaments five, inserted into the base of the tube, between the nectaries, short, thick, flattened; anthers arrow-shaped, each furnished by a small auricle, converging towards the pitill; pollen of two obovate masses, projected upon five angles of the stigma. *Pistl.* Germens two, superior, ovate-oblong; styles two, very short; stigma common to both, large, thick, roundish-ovate, smooth, with two acute points at the top, and five glandular lateral tubercles to receive the pollen. *Peric.* Follicles two, divaricated, large, oblong-oval, coriaceous, smooth, abrupt, with a small point, one of them often abortive; partition longitudinal, unconnected when ripe, except at top and bottom; the disk covered on both sides with numerous elevated, parallel, sharply toothed ridges. *Seeds* very numerous, inserted into the teeth of the receptacle, imbricated downwards, ovate, clothed with papillary pubescence, and each crowned with a tuft of long silky hairs.

Eff. Ch. Corolla bell-shaped; tube with five nectariferous cells at the base. Anthers crowned with a membrane. Stigma with two horns. Follicles smooth. Seeds comofe.

1. *A. sericofera*. Silky Araucaria.—Native of Peru. Cultivated in the green-house at Lisbon, where it flowers in autumn, and ripens seed in spring. The whole plant abounds with acrid milk, but every part is inodorous. The root is creeping. *Stem* shrubby, weak, twining, three or four feet high, round, smooth, branched, leafy; the young branches rather downy. *Leaves* opposite, stalked, lanceolate, acute, entire, nearly smooth, an inch and a half to three inches long; heart-shaped at the base, and marked with two glands on the upper side, a little above the insertion of each foot-stalk. *Flowers* three or four, or more, together, in short, lateral, drooping, smooth, somewhat corymbose clusters, about half the length of the leaves, and inserted between the bases of the footstalks. *Corolla* yellowish-white, marked with purple lines; downy about the mouth. *Follicles* three or four inches long.

ARBELA, l. 13, after Arbelitis, add—This place, once the capital of the province of Adiabene, has wholly declined from its former importance, and dwindled into a wretched mud town, with a population not exceeding 3000 souls. Part of this town is built on a hill of a conical form, on which probably stood the old castle, and the remainder of the town encircles the base of the hill. The country surrounding Erbill, its present name, lying in lat. 36° 11', and between that place and Mosul, is fruitful but hilly, and very deficient in wood, there being hardly a tree or even shrub to be seen.

ARBITRATION of Exchange. See EXCHANGE.

ARCH, l. 4, fig. 43; l. 23, fig. 43.

ARC of a Circle, l. 11, fig. 45.

ARCHER, in *Geography*, a township of Ohio, in the county of Jefferson, containing 60 inhabitants.

ARCHIPELAGO, col. 2, l. 2, *r.* 2100.

ARCTOMYS, in *Zoology*. See MARMOT.

ARCTOTHECA, in *Botany*, a name revived from Vaillant, and originally synonymous with ARCTOTIS, (see that article,) from which the genus we are about to describe has recently been separated, chiefly by the want of a feed-crown; and in habit there is no distinction.—Wendland Hort. Herrenhuf. 8." Willd. Sp. Pl. v. 3, 2365. Brown in Art. Hort. Kew. v. 5. 141.—Class and order, *Syngenesia Polygamia-frustranca*, Nat. Ord. *Compositæ*, Linn. *Corymbifera*, Juss.

Gen. Ch. *Common Calyx* roundish, imbricated; its scales elliptic-oblong, woolly; the innermost with a dilated, membranous termination. *Cor.* compound, radiated; florets of the disk numerous, funnel-shaped, five-cleft, equal, all perfect; those of the radius about twelve, ligulate, elliptic-lanceolate, longer than the diameter of the disk, with four ribs, and about three unequal teeth, neuter. *Stam.* in the florets of the disk only, filaments five, capillary, short; anthers united into a tube, nearly as long as the corolla. *Pist.* Germen in all the florets, oblong; style in those of the disk only, thread-shaped; stigma prominent, cylindrical, erect. *Peric.* none, except the permanent, dry, curled calyx. *Seeds* in the disk only, obovate, without wing or down. *Recept.* flattish, cellular.

Eff. Ch. Receptacle cellular. Seed-down none. Calyx imbricated, partly membranous.

1. *A. repens.* Creeping Arctotheca. Willd. n. 1. Ait. n. 1. (Arctotis repens; Jacq. Hort. Schoenbr. v. 3, 31. t. 306. *A. fcapigera*; Thunb. Prodr. 165.)—This, the only known species, is a native of the Cape of Good Hope. Seeds were sent by the celebrated Scopoli to the writer of this article, and the plants raised from thence flowered in the open ground in Chelsea garden, in the summer of 1790, but it was found necessary to shelter them in winter. The roots are perennial, creeping extensively. *Stems* herbaceous, prostrate, branched, clothed like the backs of the lyrate pinnatifid leaves, with fine white cottony down. *Flower-stalks* radical, several together, simple, erect, naked, about six inches high, being rather longer than the leaves. *Flowers* solitary, an inch and a half broad, lemon-coloured, with purple ribs beneath.

ARCYRIA, a curious genus of the Fungus tribe, thus named, originally by Sir John Hill, from *αρκυρ*, a net, and *εἶδος*, a honeycomb, the fine net-work of its ripe head having that appearance.—Perf. Dîp. Meth. Fung. 10. Syn. Fung. 182.—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Eff. Ch. Upper half of the head deciduous. Filaments composing a dense denudated net-work, resting on the cup-like receptacle.

1. *A. ? leucocephala.* White-headed Arcyria. Perf. n. 1. Hoffm. Dîp. Meth. v. 2. t. 6. f. 1. *Trichia cinerea*; Trentepohl in Roth Catal. v. 1. 227.)—Aggregate. Head funnel-shaped below, reddish-brown. Net-work globose, mealy, snow-white.—Found on dead leaves or sticks in autumn. Also on mosses, or fragments of leaves, in rainy weather, very copiously, in June and July, according to Albertini and Schweinîz, *Fung. Nijkien.* 100, who, like Perfoon himself hesitate whether to refer this elegant little species to this genus or to *PHYSARUM*. See that article.

2. *A. flava.* Yellow Arcyria. Perf. n. 2. Obf. Mycol. 1. 58. Dîp. Meth. 10. Albert. and Schw. Nîlk. n. 279. (*Trichia nutans*; Bulliard Fung. v. 1. 122. t. 502. f. 3. Sowerb. Fung. t. 260. *Stemonitis amœna*; Trentep. in Roth Cat. v. 1. 222.)—Aggregate, yellow. Net-work cylindrical, elongated, drooping.—Found on rotten wood in summer, consisting of little tufts, of a pale or ochraceous yellow, each plant on a short stalk; the receptacle hemispherical; the cylindrical, rather tapering, net-work from half an inch to an inch long, reclining, abundant in powdery seeds.

3. *A. cinerea.* Ash-coloured Arcyria. Perf. n. 1. Albert. and Schw. Nîlk. n. 280. (*A. albidâ*; Perf. Dîp. Meth. 10. t. 1. f. 2. *Trichia cinerea*; Bull. Fung. v. 1. 320. t. 477. f. 3. *Stemonitis glauca*; Trentep. in Roth Cat. v. 1. 221.)—Aggregate, greyish-white. Net-work

cylindric-ovate, erect. Receptacle crenate.—Found in summer, in woods, on dead branches, stalks, &c. Smaller and shorter, as well as more obtuse, but with a longer stalk, in proportion, than the last, from which also it is distinguished by its dirty-white colour. We are puzzled, as well as the learned authors of the *Fungi Nijkienfes*, by Perfoon's assertion of the resemblance of this species to the fifth, hereafter described.

4. *A. incarnata.* Flesh-coloured Arcyria. Perf. n. 4. Obf. Mycol. 1. 58. (not 38.) t. 5. f. 4. 5. Albert. and Schw. Nîlk. n. 281. (*Stemonitis globosa*, et *S. carnea*; Trentep. in Roth Cat. v. 1. 222.)—Somewhat scattered, dull flesh-coloured. Net-work pyramidal, obtuse, curved, soon deciduous. Empty receptacle valver-shaped.—Said to be very common in Germany, on oak or fir wood in decay, at all seasons. The empty receptacles resemble little reddish *Pezize*, and are marked with radiating streaks. The net-work appears to abound in farinaceous seeds of the same hue.

5. *A. punicea.* Scarlet Arcyria. Perf. n. 5. Dîp. Meth. 10. Albert. and Schw. n. 282. (*Clathrus denudatus*; Linn. Sp. Pl. 1649. Jacq. Mîc. Auflr. v. 1. 136. t. 6. *Trichia cinnabarina*; Bull. Fung. v. 1. 121. t. 502. f. 1. *T. denudata*; Sowerb. Fung. t. 49. T. n. 2164; Hall. Hist. v. 3. 115. t. 48. f. 6, as Jacquin has it, rather than t. 4, as cited by Haller himself. *Stemonitis crocata*; Trentep. in Roth Cat. v. 1. 220.)—Crowded, ovate, orange-coloured.—Frequent throughout Europe on rotten wood, in summer and autumn. When young it is white and soft, but advancing in size, it assumes a conspicuous orange-colour, with the dry rather firm texture of its genus. This fine colour chiefly resides in the copious seminal powder, for the net-work itself is brownish. The edge of the remaining base of the receptacle is often irregularly torn, and various in breadth. Bolton's v. 3. t. 93. f. 2, if really taken from this species, is not a happy representation.

ARDELAN, in *Geography*, a province of the Persian empire, forming the eastern division of Kurdistan, is in length 200 miles, from the little river Sharook to the Turkish district of Zohaub, and nearly 160 in breadth. It is separated from the plain of Hamadan by a small range of hills, and its western boundary is 100 miles beyond Senna, the capital, situated in N. lat. 35° 12', and E. long. 40°. The territories of Ardelan extend as far as Keliâ Shah Khane, and are peopled by a tribe denominated Gheskkee, who are recorded by the Kurds as the most expert and daring robbers of their nation; nor will torture induce them to betray their accomplices, being habituated to pain and severe chastisement from their earliest infancy. They are, however, slaves to the most abject superstition.

ARGOLASIA, in *Botany*, Juss. Gen. 60, a good name, constructed by Juslieu, from *αργος*, white, and *λασος*, hairy, or *shaggy*, alluding to the white woolly clothing of the herb. But this name is superfluous by one of similar meaning, LANARIA, (see that article,) given to the same plant by Dr. Solander, and published in Ait. Hort. Kew. v. 1. 462, in 1789. This latter has been adopted by Schreber, and is now established.

ARGUNNA, in *Geography*, a town of Armenia, in the pachalic of Diarbekir, distant 48½ miles from Diarbekir; situated on the side of a lofty mountain, from which torrents of water are discharged in courses through the streets so as to render them impassable. The town is populous, but wretchedly built, and is remarkable for the quantity of wine and brandy made in its vicinity.

ARJONA, in *Botany*, so named by the late abbé Cavanilles,

nilles, in honour of Mr. Francis Arjona, a celebrated lecturer on botany at Cadiz.—Cavan. Ic. v. 4. 57.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Lyfimachiis*, Juff. affine?

Gen. Ch. Cal. Perianth inferior, of two small, concave, permanent leaves, each with three terminal teeth. Cor. of one petal, funnel-shaped; tube thrice the length of the calyx, fightly dilated upward; limb in five deep, ovate, acute, equal fegments. Stam. Filaments five, capillary, very fhort, inferted into the throat of the tube; anthers oblong, within the tube. *Pift.* Germen fuperior, ovate, crowned with five minute permanent fcales; fyle fimple, three-d-shaped, the length of the tube; ftigmas two, flat. *Peric.* Berry globofe, crowned with the fcales, of two cells. *Seeds*

Eff. Ch. Corolla funnel-shaped, equal. Berry fuperior, of two cells, crowned with five fcales.

1. *A. tuberofo*. Tuberous Arjona. Cavan. as above, t. 383.—Native of South America, in dry barren ground, near Port Defire, flowering in December. We have a fpecimen from the lamented author, gathered by Louis Née. The long fibres of the *root* are furnifhed, here and there, with oval knobs, well futed to its arid fituation. *Stem* folitary, a fpan high, with numerous branches from the bottom; nearly fimple above; leafy throughout. *Leaves* very numerous, imbricated, fheathing, awl-shaped, fpinous-pointed, channelled, entire, rather fpreading, clothed with foft woolly hairs. *Flowers* in a folitary, terminal, dense, corymbofe head, *Corolla* about an inch long; externally yellowifh and very downy; internally fmooth, yellowifh-white. *Style* reddifh, with fometimes three *ftigmas*. *Berry* fmall, fmooth. *Seeds* not obferved.

There is fomething in the characters and hue of this plant, that approaches the natural order of *Veprecula*, or *Thymelæa*, efpecially in the form and afpect of its *corolla*. Poffibly the *fruit* may not really be of two cells. The two cotyledons of a fingle *drupa* might, in an early ftate, miflead the author, who fays he did not fee the *feeds*. The *bark*, however, does not appear to have thofe filky fibres, which are the ftrong indication of the *Daphne* family.

ARISTEA, (fee our former article), a name left unexplained by profefor Martyn, is rightly derived by De Theis from *ariftha*, an awn, but does not apply as he fays to the point of the leaf. Solander, the author of this name, appears rather to have alluded to the copious bearded fringe of the sheaths, fo remarkable in the original fpecies.—Ker in Ann. of Bot. v. 1. 236. Dryand. in Ait. Hort. Kew. ed. 2. v. 1. 108. Vahl Enum. v. 2. 123.

Eff. Ch. Corolla fuperior, in fix deep regular fegments, fpirally twifted together after flowering, permanent. Capfule of three cells, with many ffeeds.

Four fpecies having been added to this genus by Mr. Ker, it is neceffary to review the whole.

1. *A. cyanea*. Grals-leaved Ariftea. Ait. n. 1. Andr. Repof. t. 10.—Flowers in terminal heads. Sheaths and bractæes in many fine capillary marginal fegments.—Native of the Cape of Good Hope, as well as all the following. See ARISTEA, n. 1.

2. *A. capitata*. Talleft Ariftea. Ait. n. 2. Ker in Curt. Mag. t. 605. (A. major; Andr. Repof. t. 160. A. cærulea; Vahl n. 3. Gladiolus capitatus; Linn. Sp. Pl. 53. Moræa cærulea; Thunb. Mor. n. 15. t. 2. f. 2. Prodr. 11. Fl. Cap. v. 1. 277. Willd. Sp. Pl. v. 1. 243.)—Tufts of flowers alternate, racemofe. Sheaths ovate, entire.—Native of mountains in the road to Hautniquas and Lange Kloof, as well as of hills about Cape Town, flowering

in October and November, or in the latter fituation, two months earlier. This fpecies is two feet high, with broadifh fword-shaped leaves, and large handfome flowers, of a fine blue, compofing a long falcated *cluster*.

3. *A. fpiralis*. White Ariftea. Ait. n. 3. Ker in Ann. of Bot. n. 3. (Moræa fpiralis; Linn. Suppl. 99. Willd. Sp. Pl. v. 1. 240. Curt. Mag. t. 520. Thunb. Mor. n. 2. Prodr. 10. Fl. Cap. v. 1. 263.)—Flowers fpiked, in alternate pairs. Segments of the corolla of equal breadth. Sheaths linear-lanceolate, entire.—Native of the Cape, flowering in Auguft. *Stalk* about a foot high, *Leaves* linear-fwordfaped. *Flowers* large, two inches broad, white with a purple ftar in the centre; the three outermoft fegments brown at the back.

4. *A. melaleuca*. Mourning Ariftea. Ait. n. 4. Ker in Curt. Mag. t. 1277. (Moræa melaleuca; Thunb. Mor. n. 1. t. 1. f. 3. Prodr. 10. Fl. Cap. v. 1. 261. Willd. Sp. Pl. v. 1. 240. Vahl Enum. v. 2. 153. M. lugens; Linn. Suppl. 99.)—Flowers alternate, folitary or in pairs. Three fegments of the corolla not half the fize of the reft. *Leaves* linear.—Found in feveral fandy bufhy places, at the Cape of Good Hope, flowering in September and October. The *root* is fibrous. *Leaves* numerous, two-ranked, four to fix inches long, and not a quarter of an inch broad. *Flowers* few, fomewhat racemofe, larger than the laft, and very handfome, having three concave, almoft orbicular, fegments, of a fky-blue, an inch and a half long, with three alternate, obovate, black ones, about half as long, and much narrower.

5. *A. pufilla*. Dwarf Ariftea. Ker in Ann. of Bot. n. 5. (Moræa pufilla; Thunb. Mor. n. 4. Prodr. 11. Fl. Cap. v. 1. 265. Willd. Sp. Pl. v. 1. 241. Vahl Enum. v. 2. 154.)—Flower nearly folitary. Three fegments of the corolla narrower than the reft. *Stalk* two-edged. *Leaves* fomewhat falcate. Thunberg feems to have forgotten the particular fitations of this fpecies at the Cape. Its *root* is fibrous. *Stalk* three inches high. *Leaves* two-ranked, linear-lanceolate. *Sheaths* entire. *Corolla* blue.

ARISTOLOCHIÆ, fo named from the leading genus; is the twenty-third natural order in Juffieu's fyftem, being the only one in his fifth clafs. That clafs is defined as follows. *Cotyledons* two. *Petals* none. *Stamens* inferted into the piftil. The *Calyx* is fuperior, of one leaf. *Stamens* definite. *Germen* inferior; *style* either wanting, or fingle, or definitely multiplied; *ftigma* fimple or divided. *Fruit* of one or many cells.

The order is thus characterized. *Calyx* fuperior, of one leaf, entire or divided. *Stamens* definite. *Germen* inferior; *style* one, or nearly wanting; *ftigma* divided. *Fruit* of many cells, with numerous *feeds*.

The only genera are, *Arifolobchia*, *Afarum*, and *Cytinus*, Linnæus arranged them with his SARMENTACEÆ, but was fubfequently inclined to refer them to his RHOEADÆÆ. (See thofe articles.) We have already obferved that they do not belong to the latter, nor have they any relationship to the *Sarmentaceæ*, except fomething in the habit and foliage of *Arifolobchia*.

ARKANSAS, in *Geography*, a river of Louifiana, which, next to the Miffouri, is the moft confiderable tributary of the Miffiffippi. Its length is nearly 2500 miles, and at proper feafons it is navigable nearly through the whole diftance. In many places, however, its channel is broad and fhallow, at leaft above the rapids, fo as to render navigation almoft impracticable. Until 860 or 900 miles from its mouth it receives no confiderable freams, on account of the vicinity

of the waters of the Missouri, of the Kansas, &c. on the one side, and those of Red river on the other. The chief rivers which fall into it are, the Verdigris, the Nebracka, Canadian river, Grand river, &c. Several are remarkable for being strongly impregnated with salt; the Arkansas itself, at certain seasons, is said to be brackish. The lands on this river for 600 or 800 miles upwards are described as very fine, and capable of affording settlements, though principally untimbered. The Arkansas is a place situated 60 miles up the river, and contains 450 inhabitants. It has a few stores, and seems to be improving. There is a considerable trade with the Ojages up the Arkansas, and with the Indians, who live in the White river country. This is also a French establishment, and has the same proportion of Americans as the other towns. The territory of the Missouri contains about 874 Arkansas, whose settlements are principally in the neighbourhood of the Arkansas post, or extend up the river; and they are the least considerable of the territory. Brackenridge's Views of Louisiana.

ARMENIA, col. 3, l. 49, add—And the southern, which are possessed by numerous independent chiefs. At the close of the article Armenia add—The Turkish pachalics of Armenia are, Erzeroom, Akikfa, Khars, Bayazid, Moolh, and Diarbekr. These pachalics are subdivided into districts, governed by Vairodes.

ARMENIA, a province of Georgia, which has the Kur to the N.E., the Mossan or Sissian hills to the S., and those of the Karagatch to the W. This province has been long celebrated for its mines of gold, silver, lead, iron, and copper, as well as for its quarries of marble and Jasper; the principal of which are those of Quoefch and Tamblutt. It is the best peopled and most flourishing of the provinces of Georgia, and contains many towns. Kinnair's Persia.

ARNOPOGON, in Botany. See TRAGOPOGON at the end.

AROIDEÆ, a very natural order of plants, the seventh in Jussieu's method; being the first of his second class, of which we have detailed the characters under ΤΡΥΧÆ.

The *Aroideæ* are thus described. *Spadix* simple, many-flowered, either naked, or involved in a *Spatha*, or Sheath. *Calyx* none, or simple. *Stamens* either definite or indefinite, inserted into the *spadix*. *Germens* originating from the same *spadix*, either naked, or encompassed with a calyx, in some instances mixed with the *stamens*, in others separated from them; styles one to each *germen*, or none at all; stigmas as many. *Fruits* as many, of one cell, with one or many seeds. *Corculum* in the centre of a fleshy albumen. *Leaves* sheathing, alternate, for the most part all radical. *Spadix* often solitary, seated either on the top of the stem, or more frequently on a radical stalk. The plants are rarely caulescent; some of them remarkably irregular in the disposition of their organs of fecundation.

SECT. 1. *Spadix* enfolded in a *spatha*.

Ambrosinia, *Zosteria*, *Arum*, *Calla*, *Dracontium*, and *Pothos*, all Linnæan genera, with *Houttuynia* of Thunberg.

SECT. 2. *Spadix* naked, destitute of a *spatha*.

Orontium and *Acorus*.

It must be observed, on the authority of Jussieu himself, that the plants of this order are only presumed to be monocotyledonous, their germination not having been properly examined. The conjecture however is supported by Gærtner's figures, the habit of the plants, and the ternary disposition of the parts of fructification in some of the genera.

This order is nearly analogous to the *Piperitæ* of Linnæus, except that *Piper* and *Saururus* are included in the latter; a measure to which Jussieu himself seems inclined.

AROSIS. Add—See TAB.

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ARROBA, in Commerce, a weight in Portugal and Spain. At Oporto 1 arroba, or arrove, = 32 arateces, and 4 arrobos, or 128 lbs. = 1 quintal. The quintal at the India-house is 112 arateces. (See QUINTAL.) In Spain the arroba is also a liquid measure. A moyo of wine contains 16 arrobos, an arroba = 8 azumbres = 2 quartillos. The arroba of wine, or great arroba, is the same all over Spain, regulated by the standard measure of Toledo, which contains 34 lbs. of river water (Castilian weight), and measures 1237½ Spanish or 981 English cubic inches; so that 4 such arrobos are = 17 English wine gallons. The arroba of oil, or lesser arroba, regulated by the same standard measure, which weighs 25 lbs. of oil, or 26 lbs. 9oz. of river water (Castilian weight), and measures 966½ Spanish or 771 English cubic inches. Hence 3 such arrobos answer to 10 English gallons. The arroba is divided into 4 quartillos, or 100 quarterones or panillas. A Spanish botta contains 30 arrobos of wine, or 38½ of oil; a pipe is 27 arrobos of wine, or 34½ of oil; so that the botta is = 127½ English gallons, and the pipe 114¾. Kelly's Cambiit.

ARSKEEN, or AREKIN, a long measure in Russia. See VERSHOK.

VOL. III.

ARTERIES, *Dijases* of. Arteries being composed of blood-vessels, nerves, and absorbents, are liable to the same morbid alterations, and endowed with the same powers of reparation, as soft parts in general; their coats inflame, and pass through the different stages of adhesion, suppuration, or gangrene, in the same manner as the skin, a gland, or a muscle.

The internal coat of an artery, Mr. Hodgson observes, bears a striking analogy to serous membranes in its tendency to the adhesive inflammation; and this property is in the blood-vessels, as in all organs, the first agent of reparation in injuries from accident or disease. The inflammation which is excited by the wound or division of an artery produces an effusion of lymph, which seals the extremity of the vessel, and affecting also the external coat becomes the basis of adhesion and final obliteration. A punctured artery is united by the same adhesive process which repairs wounds in general; and if irritation be excited in the coats of an artery by pressure, adhesive inflammation is the consequence, lymph is effused into the cavity, and into the cellular substance, connecting the coats of the vessel; its sides coalesce; and it is rendered impervious. The same adhesive process frequently prevents hemorrhage, where abscesses, or extensive ulcerations, exist in the neighbourhood of large vessels, the inflammation which precedes the suppuration having produced an effusion of lymph between the coats, and into the cavity of the arteries, whereby it is obliterated. But the most perfect demonstration of the effects of acute inflammation upon the internal coat of an artery, Mr. Hodgson thinks, is to be met with in the cases where the disease appears to have extended to the vessel from the contiguous parts. Thus, in a fatal instance of violent pneumonia, besides the usual appearances on dissection, the inflammation was found to have extended to the aorta, the internal coat of which was of a deep red colour, and a considerable effusion of lymph had taken place into its cavity. The effused lymph was very intimately connected with the internal coat of the vessel, and a plug of it had extended into the left subclavian artery, and nearly obliterated the cavity of that vessel. (Treatise on the Diseases of Arteries and Veins, p. 5.) Mr. Hodgson has observed a similar state of the great blood-vessels in a less degree from carditis, pneumonia, and bronchitis,

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bronchitis. The granulations, or fungous growths, which are not unfrequently met with at the origin of the aorta upon the semi-lunar valves, or in the cavities of the heart, are said sometimes to originate in the lymph thus effused upon the internal membrane. Mr. Hodgson also assures us, that the inflammation excited in an artery of the extremities by the application of a ligature has been known to extend along the internal coat of the vessel to the heart itself, as we know is often the case with respect to the veins.

According to the same well-informed writer, chronic inflammation may generally be remarked in thickened and calcareous arteries, particularly in aneurismal subjects. The internal coat of the vessel is soft, thickened, of a deep red colour, which is not uniform, but irregularly diffused in the vicinity of ulcerations, thickenings, or calcareous depositions. P. 9.

Ulceration of an artery may commence in the vessel itself, or extend to it from the surrounding part. In the first circumstance, it is always found first on the internal coat, and is generally preceded by some other morbid change of the vessel. Thus, it is not unfrequently met with around the circumference of calcareous depositions, or upon the surface of atheromatous thickenings; and aneurism is, without doubt, occasionally a consequence of such ulceration, the coats of the vessels being completely destroyed by it, and the blood escaping into the surrounding cellular substance, which becomes gradually expanded into a sac. Hemorrhage is often caused by ulceration extending from surrounding parts to the coats of arteries, as in cancerous and phagedenic ulcers; and Mr. Hodgson even thinks that many passive hemorrhages are produced by ulceration beginning on the inner surface of these vessels.

Sphacelation of arteries in consequence of inflammation of their internal coat has not hitherto been observed. Arteries, however, are often included in extensive sloughing of parts, in which case the blood generally coagulates in the vessels to a considerable extent above the line of sphacelation; an occurrence which seems destined to prevent hemorrhage on the separation of the slough. The coagulum is afterwards absorbed, and the vessel obliterated.

From considering the inflammation of arteries and its effects, our author proceeds to speak of various morbid appearances to which the coats of arteries are liable, in consequence of their peculiar structure and functions.

1. The internal coat of arteries is sometimes thickened and converted into a substance resembling cartilage, or the thickened peritoneum of an old hernial sac. This disease is confined to the internal coat, which having lost its elasticity sometimes cracks, and forms scales that hang into the cavity of the vessel. Calcareous depositions often accompany this alteration of structure, and the surrounding parts of the membrane generally exhibit signs of chronic inflammation. The semi-lunar valves of the aorta are not unfrequently changed into a dense fibrous structure, resembling ligament, or tendon; sometimes they are converted into cartilage, and are manifestly incompetent to their office as valves. In several instances, Mr. Hodgson has found them ruptured, forming cartilaginous eminences on the sides of the vessel.

2. The internal surface of arteries exhibits frequently a thickened and pulpy structure, sometimes with the appearance of small flattened tubercles, and, in other examples, with an irregular and somewhat fleshy appearance over the whole surface. This disease is confined to the internal coat, and is often found in aneurismal subjects.

3. A deposition of atheromatous or purulent matter in the cellular membrane, which connects the internal and middle coats of the vessel. The diseased part is of an opaque yellow colour, sometimes extensive, and considerably elevated above the surrounding surface, and on other occasions circumscribed, and having a pustular or tuberculated appearance. If punctured, matter may be pressed from underneath the internal coat, varying in consistency from that of cheese to that of common pus. Mr. Hodgson has seen the emulgent and femoral arteries in the same subject quite obstructed by the accumulation of this curdy matter.

4. Certain fungous or wart-like excrescences have been observed upon the semi-lunar valves of the aorta and pulmonary artery, and also upon the mitral and bicuspid valves. They are of rare occurrence. Corvisart's opinion respecting the syphilitic nature of their cause is not intitled to any degree of credit; and Mr. Hodgson relates a case, where the absence of that disease throughout the whole of life made it impossible that they could have had such an origin. The femoral artery and commencement of the profunda were in this instance completely obstructed by a fungous growth, similar to what was found upon the semi-lunar valves of the aorta.

5. The next disease to be noticed is a deposition of calcareous matter in the coats of arteries. In old age this happens so frequently, that Bichat was induced to regard it as a natural phenomenon rather than a disease. The incrustation seems to commence in the substance of the internal coat, a delicate pellicle covering the calcareous matter, and separating it from the blood passing through the cavity of the vessel. Sometimes this pellicle is deficient, or hangs into the cavity of the vessel, and the blood is in contact with the incrustation itself. Sometimes all the coats of the vessel are involved in the disease, and are converted into a long cylinder, in which no remnants of the original structure can be traced. (Hodgson, p. 21.) The formation of these depositions bears no resemblance to that of bone; they are seldom, if ever, preceded by the existence of cartilage; and no regular arrangement is discernible in them, corresponding to the fibrous structure of bone. According to Mr. Brande's analysis of them, they contain 65.5 phosphate of lime, and 31.5 animal matter, without any carbonate of lime.

Calcareous matter is frequently deposited in the substance of the semi-lunar valves of the aorta, and produces more serious consequences, than when it takes place in any other part of the arterial system. The valves becoming rigid and fixed diminish the size of the opening into the aorta. Whilst the pulse at the wrist is feeble, the heart is acting violently to compensate for the diminution in the quantity of blood which should pass through the aorta; and this comparative difference between the pulse at the wrist and that at the heart will, Mr. Hodgson conceives, in advanced cases, be sufficient to enable us to ascertain the existence of this incurable disease. A similar disproportion between the pulse at the heart and at the wrist exists also when the opening between the left auricle and ventricle is contracted; but a double pulsation of the heart has been observed in this case, and is said to distinguish it from contraction of the orifice of the aorta by ossification of its valves.

Mr. Hodgson has given some interesting cases of ossification of the coronary arteries. In one, the heart was unusually small; its parietes soft and flaccid, and upon the ventricles not the eighth of an inch thick; whilst the coronary arteries and many of their ramifications were converted

into

into calcareous tubes, and some of them nearly rendered impervious. This morbid appearance does not exist in every case which is attended with the train of symptoms, to which we apply the term *angina pectoris*. Violent pain in the situation of the heart, extending down the anus, and terminating in a sensation of numbness, palpitation, and irregularity in its action, with frequent syncope and difficult respiration, accompany almost all the organic diseases of that organ. (Hodgson, p. 36.) The deposition of calcareous matter is seldom found in the upper extremities; and although so frequent in the aorta, it has rarely or never been met with in the pulmonary artery, or its valves. See Hodgson on the Diseases of Arteries and Veins, 8vo. London, 1815.

Aneurism, which constitutes the most important disease of arteries, has been treated of in a separate article, to which we have already annexed some additional particulars under the head of SURGERY. A few other observations, relative to the same subject, will be found at the words ANEURISM and AORTA in this *Addenda*.

ARTHONIA, in *Botany*, a genus of the Lichen tribe, thus named by its learned author professor Acharius, in *Schrad. Neues Journal*, v. 1. fasc. 3. t. 1. 4. "Lichenogr. Univ. 25. t. 1. f. 3, 4." Syn. 4. Sm. Engl. Bot. v. 29. 2079.—Class and order, *Cryptogamia Alge*. Nat. Ord. *Lichenes*.

Eff. Ch. Receptacles in an uninterrupted crust, shapeless, without a border, smooth, in which the seeds are imbedded.

In habit, the generality of the species which constitute this genus are akin to *SPILOMA* and *OPEGRAPHIA*. (See those articles.) But Acharius originally included herein the *Lichen croceus*, and *L. faccatus* of Linnaeus, which are now separated on account of their totally different habit, and leafy fronds, by the name of *Solorina*, *Lichenogr. Univ.* 27. t. 1. f. 5, 6; so that *Arthonia* is rendered much more natural. In the *Synopsis* of this writer, his latest publication, twelve species are defined.

Among them are,

A. Swartziana, n. 5. Engl. Bot. t. 2079.—Crust thin, membranous, scaly, cream-coloured. Receptacles sessile, black, depressed, roundish, wavy, rather uneven, confluent.—Found on the smooth bark of trees.

A. afroidea, n. 7. (*Opegrapha afroidea*; Ach. Meth. 25. Engl. Bot. t. 1847).—Crust limited, membranous, smooth, greenish-white, somewhat shining. Receptacles depressed, flat, angular, irregularly starry, black.—Frequent on young trees. We cannot consider this otherwise than as an *Opegrapha*.

A. obicura, n. 8. Engl. Bot. t. 1752.—Crust membranous, olive-brown. Receptacles minute, flattish, thin, elliptical or kidney-shaped, sunk, slightly uneven, black.—On the barks of trees, not common, nor very easily to be observed. The crust rises into irregular swellings, and the copious receptacles are sunk very deep into its substance. The genus of this plant is indeed obscure, nor can we offer any better determination respecting it than that of Acharius.

A. lyncea, n. 11. (*Lichen lynceus*; Engl. Bot. t. 809.)—Crust white, thin, even, somewhat tartareous. Receptacles numerous but distinct, flat, rather sunk, oblong, blunt, often curved, black, with a glaucous tinge.—Found by Mr. Sowerby, nearly covering the rugged barks of old oaks. The receptacles resemble a leopard's or lynx's skin, and are not crowded nor confluent, though curved and approaching each other in every direction, the margin of each black. We should rather refer this species to *Opegrapha*.

A. pruinosa, n. 12. (*Lichen impolitus*; Ehrh. Crypt. Achar. Prodr. 56. Engl. Bot. t. 981.)—Crust whitish, thin, somewhat tartareous, unequal, smooth. Receptacles flat, sunk, roundish or angular, confluent, dull orange-brown, with a glaucous tinge.—On the trunks of trees, especially oaks. We cannot but think the original specific name peculiarly happy, and for that reason, if no other, it ought not to have been changed, especially as *pruinosa* is equally suitable to the last species. The present looks of an uniform dirty white, till touched by some hardish body, when the brown receptacles, tinged with yellow, become strikingly apparent, and are contrasted with the unaltered crust. The figure in *Engl. Bot.* printed in red, is altogether erroneous.

ARTHROPODIUM, named in allusion to the joint in each flower-stalk, by Mr. Brown, from *αρθρον*, a joint, and *πους*, a foot, or support.—Brown Prodr. Nov. Holl. v. 1. 276. Ait. Hort. Kew. v. 2. 271.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Coronaria*, Linn. *Asphodeli*, Juss. *Asphodeles*, Brown.

Gen. Ch. Cal. none. Cor. of one petal, inferior, in six deep, regular, spreading, deciduous segments; the three innermost waved or fringed at the margin. Stam. Filaments six, tapering, densely bearded; anthers roundish, attached by the notch at their base. Pist. Germen superior, roundish, with three furrows; style solitary, erect, cylindrical; stigma capitate, hairy. Peric. Capsule nearly globular, with three furrows, three cells, and three valves; the partitions from the centre of each valve. Seeds few in each cell, somewhat angular, with a naked scar.

Eff. Ch. Corolla in six deep equal segments; three innermost waved or fringed at the margin. Filaments bearded. Capsule nearly globular.

This genus is allowed by its author to come very near *Anthericum*, to which some of the species have been referred by other writers. Indeed we can discover no difference, (three of the filaments in *Anthericum*, if not all of them, being bearded,) except the wavy or fringed inner segments of the corolla. *Anthericum* being a very extensive genus, whose limits are not well defined, it is highly desirable to lessen the number of species, by establishing new genera from among them, by any certain, however apparently slight, criterion; and it must always be recollected that, in the natural order to which these plants belong, very natural genera are discriminated by apparently rather trivial marks.

Arthropodium is observed by Mr. Brown to consist of smooth herbaceous plants, with fasciculated roots, composed either of bulbs, occasionally stalked, or of thick fleshy fibres. Leaves linear, flaccid. Clusters lax. Flower-stalks either aggregate or solitary, each with a joint in the middle. Flowers pendulous, either purplish or white. Corolla closing after flowering, and long before the fruit ripens, falling off, leaving its permanent cup-like withered base behind. The anthers are purple, or whitish. THYSANOTUS of our learned friend, already described in our thirty-fifth volume, comes nearer to *Arthropodium* and *Anthericum* than to the *Asparagus* tribe, to which it has been referred; the beautifully fringed inner segments of the corolla especially resembling the present genus. But *Thysanotus* has smooth filaments, unequal anthers, and a declining style, with a smaller stigma. The seeds moreover differ very essentially.

1. *A. paniculatum*. Panicked *Arthropodium*. Br. n. 1. Ait. n. 1. (*Anthericum paniculatum*; Andr. Repof. t. 395. *A. milleforium*; Redout. Liliac. t. 58.)—Cluster divided; flower-stalks aggregate. Inner segments of the corolla
X x 2 finely

finely crenate. Capsule pendulous. Bulbs stalked.—Native of the neighbourhood of Port Jackson, New South Wales, from whence we received specimens, near thirty years ago, through the hands of Dr. White. Seeds were communicated by Mr. Geo. Caley to Sir J. Banks, for Kew garden, in 1800, and this elegant species is now to be seen in many green-houses, flowering in various summer months. The root is perennial. Stem erect, round, three or four feet high; slightly leafy in the lower part; much branched and panicled above. Leaves linear, pointed, channelled; sheathing at the base, a foot or more in length, chiefly radical. Branches of the panicle usually in pairs, spreading, racemose. Flowers drooping, three or four together, on undivided partial stalks. Corolla reflexed, half an inch in diameter, white variegated with lilac; three outer segments small, acute; three inner ovate, elegantly crisped at the margin. Beard of the *filaments* dense, yellow. Anthers and *stigma* purple.

2. *A. strictum*. Upright Arthropodium. Br. n. 2.—“Cluster almost simple, many-flowered; flower-stalks foliary. Capsules erect.”—Gathered by Mr. Brown, in Van Diemen’s island, but after the flowers were past.

3. *A. minus*. Lesser Arthropodium. Br. n. 3.—“Cluster simple, with few flowers; flower-stalks foliary. Bulbs sessile.”—Found by Mr. Brown, near Port Jackson.

4. *A. fimbriatum*. Fringed Arthropodium. Br. n. 4.—“Cluster simple; lower flower-stalks in pairs. Filaments naked in their lower part; tumid and spongy at the top. Anthers linear. Inner segments of the corolla fringed.”—Native of the neighbourhood of Port Jackson, where it was noticed by Mr. Brown, who observes that the structure of the *filaments* is so different from the rest, as to make him hesitate whether this species ought not to form a genus by itself. We are not sure whether we are possessed of any specimens.

ARTHROSTYLIS, from *αρθρον*, a joint, and *στυλος*, the style, because of the articulation by which that part is joined to the germen.—Brown Prodr. Nov. Holl. v. 1. 229.—Class and order, *Triandria Monogynia*. Nat. Ord. *Calamaria*, Linn. *Cyperaceae*, Brown.

Ess. Ch. Spikelet single-flowered. Glumes chaffy, imbricated; the lower ones empty. No bristles around the germen. Style awl-shaped, triangular, articulated with the germen, deciduous. Stigmas three. Nut triangular.

1. *A. aphylla*. Leafless Arthrostylis. Br. n. 1.—Found by Sir Joseph Banks, in that part of New Holland which lies within the tropic. The stems are slender, unbranched, without joints or knots; sheathed at the base; naked in the upper part. Head terminal, simple, turbinate, longer than its three or four-leaved, awl-shaped involucre. This genus differs from *ABILDGARDIA* in its habit, and single-flowered spikelet; from *RHYNOSPORA* in having a deciduous style, and no bristles surrounding the base of the germen; see those articles. Brown.

ARTUSI, l. 4, insert, he.

ARVE, for Rhine r. Rhone.

ARUNDINARIA, in Botany, inadmissible as a generic name, being formed by an alteration of *Arundo*, already received, is applied by Michaux, Fl. Boreal-Amer. v. 1. 73, to a genus now called *Miegia*, in Perf. Ench. v. 1. 102, according to Pursh, 59. This cannot, we presume, answer to Schreber’s *MIEGIA*, (see that article,) as the florets in Michaux’s plant are numerous; so that here is some confusion which we must leave the writers in question to settle.

AS, in Commerce, a small Dutch weight, used also at Hamburg, and in Sweden. At Amsterdam, 640 ases are = an ounce, and 8 ounces = a mark troy. (See MARK.)

In Sweden the smallest denomination of weight is the *as*, which is the same as the *as* of Amsterd. The mark for weighing gold and silver, called “silver-mark,” is 4384 ases, or 3252 grains English troy weight. Hence 40 such marks are = 271 ounces troy. In apothecaries’ weight, the pound is 7416 ases, or 5400 grains troy; and hence 16 such pounds = 15 pounds English troy, or apothecaries’ weight.

As, l. 16. 23, 27, for Tullius r. Tullus.

ASAM, l. 2, after Bengal, insert—bordering on the country of the Grand Lama, or Bootan;—after Hindostan, or separated from Decca, the N.E. quarter of Bengal, by a range of hills, intersected by the Garrows;—after Meckley, or Ava and Arracan.

L. 16, after journey, add—It is underfoot to be about 700 miles in length, and its mean breadth above 70, though in some places, where the mountains recede, it greatly exceeds that proportion. Dr. Wade thinks 60,000 square miles a very moderate calculation of its superficial extent, so that it considerably exceeds England and Wales. The whole country is a valley of great fertility, not only divided by the great stream of Burhampooter, but every where intersected by numerous rivers.

ASAPH, Str. l. 12, for Shipley r. Bagot.

ASCHRAFF. Add—This place is seated on the shore of a bay, which is the only good harbour on the southern side of the Caspian sea.

ASCOBOLUS, in Botany, from *ασκος*, a skin, or case, and *βολος*, a cast, or throw, because the seeds are thrown out with elasticity, several together, in oblong cases.—Perf. Syn. Fung. 676. Obf. Mycol. fasc. 1. 33.—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Ess. Ch. Receptacle hemispherical, fleshy. Seed-cases prominent, oblong, discharged elastically. Seeds about eight, lodged in moisture.

1. *A. furfuraceus*. Powdery Ascobolus. Perf. Obf. Mycol. fasc. 1. 33. t. 4. f. 3, a, and 4, 5, 6. (Peziza stercoraria; Bull. Fung. v. 1. 256. t. 376. Sowerb. Fung. t. 18.)—Crowded, rather concave, olive-brown, externally scurfy.—Common on cow-dung late in autumn. Variable in colour. Bulliard has what he conceives a variety, t. 438. f. 4, in which the disk is pale purple, the outside white.

2. *A. carneus*. Flesh-coloured Ascobolus.—Smooth, flesh-coloured.—Found rarely on dung, in woods. All over of a very pale red.

3. *A. glaber*. Smooth Brown Ascobolus. Perf. Obf. Mycol. fasc. 1. 34. t. 4. f. 3, b, and f. 7, a, b, c.—Minute, crowded, smooth, rather convex, of a shining brown.—Common on cow-dung, in autumn. Variable in shape according to its age.

4. *A. immersus*. Sunk Ascobolus. Ibid. 35. t. 4. f. 7, d, e.—Scattered, immersed, irregular, somewhat conical, rather scurfy externally.—In the same situations, almost entirely sunk in the dung, so that the seed-cases only are prominent, containing black seeds, floating in an evident fluid. Perfoon.

ASCOPHORA, from *ασκος*, a skin, or bladder, and *φορα*, to bear. The name originated with Tode, Fung. Mecklenb. fasc. 1. 13, who extended his genus to several species. Perfoon restricts it to a solitary species. Perf. Syn. Fung. 685.—Class and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Ess. Ch. Thread-shaped, terminating in an empty, slightly inflated, head.

1. *A. perennis*. Perennial Bladder-mould. (*A. ovalis*; Tode Fung. Mecklenb. fasc. 1. 15. *Afidium oratum*; Tode

Tode in Schrift. der Berl. Gesellsch. Naturf. Fr. v. 3. 247. t. 4. f. 4—6.)—Found in autumn, either at the extremities of the branches, or on the trunks, of trees, such as Willows, &c. It may be preserved a long time without decaying, or even shrinking. Tode describes the *head* as at first like a drop of water, but soon assuming an oval figure, shining like silver, and subsequently besprinkled with snow-white powder, probably the *seeds*. This betrays some affinity to *STILBUM*; see that article.

ASCIDIA, l. ult., *dele* which see respectively, and insert, See *VERMES*.

ASCONIUS, l. 1, r. *Pedicularis*; l. 3, 4, *dele* Quintilian and *ASH*, in *Geography*, a county of North Carolina, containing 6304 inhabitants, 147 being slaves.

ASHARIANS. See *ASCHIARIANS*.

ASHBURNHAM, l. 4, r. 1036.

ASHBY, l. 3, r. 1103.

ASHFIELD, l. 4, r. 1809.

ASHFORD, a township of America, &c. add—The number of inhabitants by the census in 1810 is 2532.

ASHFORD, *New*, &c. for 460 r. 411.

ASHTABELU, a township of the county of Georgia, in the district of Ohio, having 221 inhabitants.

ASHTON, a township of Pennsylvania, in the county of Delaware, having 765 inhabitants.

ASIA, col. 24, l. 31, after height, insert—but by late discoveries and measurements, their altitude has been found to be much more considerable than geographers formerly apprehended and stated. See *MOUNTAINS*.

ASILUS, l. 16, *dele* which see respectively.

ASMINA, in *Botany*, a barbarous name, employed by Adanson, and, according to him, of Canadian origin. De Candolle, by his adoption, *Syll. v. 1. 478*, might possibly render it classical, there being no objection on the score of euphony, nor any meaning contrary to reason or sense, as in many other cases of a similar kind. As far as we know, the word is destitute of all meaning whatever; in which respect Michaux's synonym, *Orchidocarpum*, would be preferable, were the idea it conveys unexceptionable, and the word not compounded of another generic name. All things considered, we prefer *PORCELIA* (see that article hereafter) as entirely free from objection; for we cannot follow our distinguished friend, De Candolle, in separating this last-named genus from his *Afmina*. Our preceding articles *ORCHIDOCARPUM* and *PORCELIA* are now superseded, in consequence of more accurate information, chiefly furnished by De Candolle.

ASPARAGI, the 12th natural order in Jussieu's system, the second of his third class; for the full characters of which class, see *PALMÆ*.

Jussieu thus defines the *Asparagi*, which are nearly equivalent, as we have already observed, to the Linnæan *SARMENTACEÆ*. See that article.

Calyx in six divisions, regular, usually deeply divided and inferior, rarely superior. *Stamens* six, inserted into the lower part, rarely into the middle, of the calyx. *Germen* simple, mostly superior; styles either three, with as many stigmas, or the style is simple, with a simple or three-cleft stigma. *Fruit* pulpy, rarely capsular, superior, rarely inferior, of three cells, with one, two, or not many more seeds in each. *Coraculum* at the scar of the horny albumen.

The *stem* is frequently herbaceous, in some cases shrubby. *Leaves* mostly alternate, seldom opposite or whorled, for the most part not sheathing, but merely clasping the stem. *Flowers* each with a separate sheath; in some instances, perhaps from abortion, dioecious. A third part of the fructi-

fication is sometimes, in a few instances, suppressed, or a fourth is added.

SECT. 1. *Flowers perfect. Germen superior.*

Dracena of Linnæus; *Dianella* of Lamarck; *Ripogonum* of Forster; *Flagellaria* and *Asparagus* of Linnæus; *Calixene* and *Phlegia* of Comberlon; *Medeola*, *Trillium*, *Paris*, and *Convallaria* of Linnæus and others, constitute this section.

SECT. 2. *Flowers dioecious. Germen superior.*

Ruscus, *Smilax*, and *Dioscorea*.

SECT. 3. *Flowers dioecious. Germen inferior.*

Tamus of Linnæus, (which Jussieu, following Tournefort, calls *Tamnus*), and *Rajania*.

Mr. Brown, *Prodr. Nov. Holl. v. 1*, has greatly curtailed this order, referring some of its genera to the *Asphodeli* or *Asphodeleæ*, and establishing out of it a new order, termed *Smilacæ*, composed of *Trillium*, *Paris*, *Medeola*, (except its Cape species,) *Convallaria*, and *Streptopus*, with his own *Drymophila*, *Ripogonum* of Forster, and *Smilax*. The same author has also founded on the genera of *Dioscoreæ* and *Rajania* another order called *Dioscoreæ*; but surely *Tamus*, by his own account, connects this with the *Smilacæ*.

ASPE, for *Berne r. Bear*; and for *Switzerland r. France*.

ASPER, in *Commerce*. Subjoin—See *PIASTRE*.

ASPERGILLUS, in *Botany*, a name first applied by Micheli, *Nov. Gen. 212. t. 91*, to a tribe of minute *Fungi*, and expressive of their resemblance to the form of a sprinkling-brush, used for holy water in Catholic countries. This tribe is now become a section of Perfoon's *MONILIA*. See that article.

ASPERIFOLIÆ, the forty-first of the natural orders of Linnæus, is one of the most natural of these assemblages. It was first pointed out by Cæsalpinus, but obtained the above name from Ray, in allusion to the roughness of the foliage. To this character one or two species of *Cynoglossum* and of *Pulmonaria* alone afford exceptions; which indeed are but partial, for even in these some bristly roughness is almost always to be discovered, either on the surface or margin. This order is analogous to Jussieu's *Borragineæ*, and is so well defined that Linnæus has, contrary to his usual practice, given its characters at some length, as follows.

Root fibrous. *Cotyledons* two. *Stem* with alternate round branches. *Leaves* alternate, simple, for the most part nearly entire, rough with scattered bristly hairs, or callous warts; convolute before they expand. *Stipulas* wanting, as well as all other appendages in general. *Flowers* unilateral; their common stalks, generally in pairs, revolute in a spiral manner, and gradually unrolled as the flowers are ready to open. *Calyx* in five more or less deep divisions. *Corolla* monopetalous, inferior, five-cleft, regular except in *Echium*; its mouth either closed with vaulted valves, or crowned with teeth, or naked and perversive. *Stamens* five, equal, except in *Echium*. *Fruit* superior. *Germens* four, except in some species of *Cynoglossum*, *Tournefortia*, and *Nolana*, to which *Cerinthæ* should be added; but *Nolana* was properly removed by Linnæus afterwards to his *Luride*; these are inserted into the receptacle by their base; hence the lower part of each *seed* becomes tapering, as if finished artificially. *Pistil* one; style not an elongation of the germens, but sunk between them in the centre, often divided into two equal parts. *Seeds* four, rarely combined into two.

The genera stand thus:

SECT. 1. *Symphytum*, *Onosma*, *Cerinthæ*, *Borago*, *Echium*, *Lycophilis*,

Lycopis, *Asperugo*, *Pulmonaria*, *Lithospermum*, *Cynoglossum*, *Anchusa*, *Myosotis*, and *Heliotropium*.

SECT. 2. *Tournefortia*, *Varronia*, *Ebretia*, *Cordia*, and *Patagonula*.

SECT. 3. *Nolana*; here placed by itself, is now removed.

In the Linnæan manuscript, *Messerschmidia* is introduced between *Echium* and *Lycopis*; *Gledisia* after *Heliotropium*; *Hypophyllum* and *Ellisia* after *Tournefortia*; and *Ebretia* is removed to the end of all.

In the generic distinctions of this order, the valves or teeth of the *corolla*, and the more or less deep divisions of the *calyx*, take the lead. Linnæus has been thought by some to have multiplied the genera beyond necessity; yet it is hard to say how they could naturally be abridged. The plants love a dry hilly situation, and become smoother as they approach nearer to water.

The numerical anomaly in the fructification of the *Asperifolia*, of the four-cleft fruit, with a five-cleft flower, is one of their striking characters, in which they indeed agree with the Linnæan *Verticillata*, Jussieu's *Labiata*; but the irregular *corolla*, unequally-divided style, opposite leaves, and square stems, of the latter, and especially their four *stamens*, two longer and two shorter, clearly distinguish them. Their qualities also greatly differ, being aromatic, not mucilaginous and scentless. Their *flowers* are generally red or purple; those of the *Asperifolia* of a beautiful blue, though mostly of as beautiful a red before expansion.

ASPHODELI, the sixteenth natural order in Jussieu's method, the sixth of his third class, thus denominated after *Asphodelus*, one of its well-known genera. Mr. Brown, who has greatly enriched this order with new genera, as well as with removals from the ASPARAGI (see that article), gives it the appellation of *Asphodeleæ*, Prodr. Nov. Holl. v. 1. 274. The characters of Jussieu's third class are detailed under PALMÆ. He thus defines the *Asphodeli*.

Calyx inferior, coloured, often in fix deep equal segments; rarely tubular, with six less deep divisions. *Stamens* six, inserted into the bottom or the middle of the *calyx*. *Germen* superior, simple; style single; stigma either simple or three-cleft. *Capsule* of three cells and three valves, with many seeds.

The root in a great portion of these plants is bulbous, sending up a leafless stalk, and producing capillary fibres from its base downwards; in the rest it is fibrous, bearing a stem, for the most part herbaceous. *Leaves* sheathing, alternate, all generally radical. *Spike* often simple, terminating the stalk; sometimes branched, with scaly sheaths under each branch. *Flowers* each accompanied by a sheath, or spathe, spiked, (in *Allium* umbellate,) terminal, or rarely axillary.

SECT. 1. *Flowers* spiked. *Root* fibrous. *Calyx* tubular. *Aletris* and *Aloe* compose this section.

SECT. 2. *Flowers* spiked. *Root* fibrous. *Calyx* in six deep segments, bearing the *stamens* at its base.

Anthericum of Linnæus, comprehended under *Asphodelus* by Tournefort; *Phalangium* of Tournefort, partly comprehended by Linnæus under *Anthericum* (and very improperly named, as *Phalangium* is an established genus of insects); with *Asphodelus*, of Tournefort and Linnæus, constitute this section.

SECT. 3. *Flowers* spiked. *Root* bulbous. *Calyx* tubular at the base.

Basilæa of Jussieu, now universally called *Eucomis*; *Hya-cinthus* of Tournefort and Linnæus, including *Muscari* of the former; *Phormium* of Forster, and *Mafonia* of Thunberg. *Lachenalia* of Jacquin ought also, as Jussieu suspects,

to be placed here, being very distinct from *Phormium*, though once confounded with it.

SECT. 4. *Flowers* spiked. *Root* bulbous. *Calyx* in six deep segments, bearing the *stamens* at their base.

Cyanella, *Albica*, *Scilla*, and *Ornithogalum*.

SECT. 5. *Flowers* umbellate. *Root* bulbous. *Calyx* in six deep equal segments.

Allium is here the only genus.

Mr. Brown declares, that he has in vain sought to establish a clear definition of this order, though a truly natural assemblage, whether considered as an order by itself, or as a section of the *Liliaceæ*. (See *LILIA*.) He has not been able to detect any character common to all the plants, which is not found in several of their near allies, except the black, crustaceous, brittle skin of the *seed*, easily separable from its very thin proper membranous integument. Hence Mr. Brown has been led to place at the end of this family *Hypoxis* and *Curculigo*, as having a similar skin, though their *germen* is inferior: and for the same reason he removes *Blandfordia* from hence, not only on account of the hairy integument of its *seed*, but also because there is a difference in the bursting of its *capsule*, to say nothing of other particulars. The same author notices a joint at the middle or summit of the flower-stalks, frequent in this family, and scarcely observable in the neighbouring orders, except in *Sansfevieria*, and some of the *Commelina* tribe. He is decided against separating the pulpy-fruited genera from the rest, either in this order, or the true *Liliaceæ*. It is needless to point out, that what Jussieu and Brown term *calyx* in all these plants, is with Linnæus and his school a *corolla*, and bears the latter appellation in Hort. Kew. The New Holland *Asphodeleæ* are thus arranged by Mr. Brown. *Anthericum*; *Arthropodium*, Br.; *Chlorophyllum*, Ker in Curt. Mag.; *Casia*, *Tricoryne*, and *Stypandra*, of Brown; *Dianella*, *Lamarck*; *Cordylina*, Commerçon; *Asparagus*; *Eustrephus*, Br.; *Luzuriaga*, Ruiz et Pavon Fl. Peruv.; *Thysanotus*, Br.; *Sowerbea*, Sm.; *Laxmannia*, Br.; *Borya*, Labill. Nov. Holl.; *Johnsonia*, Br.; and *Xanthorrhæa*, Sm. To which are subjoined genera intermediate between the *Asphodeleæ* and *Amaryllidææ*; *Hypoxis*; *Curculigo*, Gærtn.; and *Campynema*, Labill. With *Astelia*, intermediate between *Asphodeleæ* and *Juncææ*.

ASPIDIUM, a genus of *FILICES* (see that article), separated from the Linnæan *Polypodium*, on account of its being furnished with an involucre, to each round dot, or mass, of *capsules*, *ovoides* meaning a small shield, which is very descriptive of the shape of this involucre. The propriety of subdividing the original *Polypodium* was doubtfully hinted by the writer of this article; in his Essay on the Genera of Doriferous Ferns, and Dr. Swartz adopted this measure. Mr. Brown has carried it still further, by founding his genus NEPHRODIUM; see that article and POLYPODIUM. We need not here repeat our observations, already made in those places. We shall give a general view of *Aspidium*, according to our ideas of this genus.—Swartz in Schrad. Journ. for 1800. v. 2. 29. Syn. Fil. 42. Sm. Fl. Brit. 1118. Willd. Sp. Pl. v. 5. 211. Ait. Hort. Kew. v. 5. 507. Brown Prodr. Nov. Holl. v. 1. 147. Pursh 660. (Nephrodium; Michaux Boreal.-Amer. v. 2. 266. Brown Prodr. Nov. Holl. v. 1. 148.)—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices*.

Gen. Ch. *Capsules* annulated, numerously assembled in roundish masses, scattered over the back of the frond. *Involucre* roundish or kidney-shaped, with a lateral sinus, by which it is attached to the frond, at length becoming umbilicated, and more or less orbicular.

ASPIDIUM.

Eff. Ch. Fructification in roundish, feathered, not marginal, dots. Involucrum umblicated, separating almost all round.

Sect. 1. *Fronde simple*. Two species in Swartz; three in Willdenow.

A. nodosum. Knotty Shield-fern. Willd. n. 1. (*A. articulatum*; "Schkuhr Crypt. 28. t. 27, copied from Plumier." *Lingua cervina lucida*, pediculis articulatis; Plum. Fil. 118. t. 136. Petiv. Fil. t. 10. f. 3.)—Fronde simple, oblong, wavy, bordered; acute at each end. Dots in interrupted lines. Stalks jointed, smooth. Root creeping, chaffy and hairy.—Found by Plumier on trees in the forests of Martinico, no other botanist having, as far as we know, ever met with this species. Willdenow separates it from the following, which he had examined, chiefly on account of the *fori* being disposed in chain-like rows, and the *frond* having a thickened margin. Petiver's figure is copied from Plumier, as usual with the Ferns of that author.

A. articulatum. Jointed Shield-fern. Swartz n. 1. Willd. n. 2. (*Polypodium articulatum*; Lamarek Dict. v. 5. 514.)—Fronde simple, oblong-lanceolate, finely crenate and wavy, pointed. Dots feathered, foliary. Stalks jointed, scaly. Root creeping, chaffy and hairy.—Native of the Mauritiuis, on trunks of trees. We have one of Commerçon's specimens. The *fronds* are a foot long, not thickened at the edges, but very unequally and minutely wavy, as if crenate; the *stalk* of each not one inch in length, instead of two, or more, as in the foregoing. *Sori* in a simple, slightly undulating row, on each side the mid-rib, not half way between it and the margin, rather small. *Involucrum* perfectly peltate, but more or less notched at one side, dark brown; pale and undulated at the circumference. *Capsules* light brown, minute.

Sect. 2. *Fronde ternate*. One species in Swartz; four in Willdenow.

A. trifoliatum. Three-leaved Variable Shield-fern. Sw. n. 3. Willd. n. 5. Ait. n. 1. "Schkuhr Crypt. t. 23." (*Polypodium trifoliatum*; Linn. Sp. Pl. 1547. Jacq. Coll. v. 3. 185. Ic. Rar. t. 638. Petiv. Fil. n. 18. t. 7. f. 3. Hemionitis maxima trifolia; Plum. Amer. 22. t. 32. Fil. 127. t. 148. Hemionitidis affinis-filix major, trifida, auriculata; pinnis latissimis sinuatis; Sloane Jacq. v. 1. 85. t. 42.)

β. Polypodium Pica; Linn. fil. Suppl. 446.

Fronde smooth-edged; either simple, heart-shaped at the base, and three-lobed; or ternate, partly pinnatifid at the middle lobe or leaflet largest: lateral ones auricled at the base.—Native of groves and shady places in the West Indies. A rather large, very variable species, of a fine grass-green, thin and pliant; either simple, in three deep taper-pointed lobes, laterally lobed or auricled, in which state it is, as Swartz rightly judged, *Polypodium Pica* of the younger Linnæus; or perfectly and simply ternate, like Plumier's figure, copied by Petiver, and Pluk. Phyt. t. 291. f. 3; or the leaflets are three-lobed, sinuated, occasionally pinnatifid, as in the plates of Jacquin and Sloane. The *fori* are numerous and scattered. *Involucrum* perfectly peltate, separating equally all round, without any sinus, or notch. The margins of all the segments or leaflets are sometimes only undulated, but more frequently toothed, in a blunt irregular manner.

A. cicutarium. Hemlock Shield-fern. Swartz n. 46. Willd. n. 7. Pursh n. 1. (*Polypodium cicutarium*; Linn. Sp. Pl. 1549, excluding both the synonyms of Plukenet, and inserting the following. *Filix jamaicensis*,

five *Polypodium Cicutarie* latifoliae foetidissimae foliis quodammodo conveniens, &c.; Pluk. Almag. 153. t. 289. f. 4.)—Fronde ternate: leaflets pinnatifid, pointed, with rounded, obtuse, entire segments; the lowermost segments greatly elongated and subdivided.—Native of mountains in Jamaica and Virginia. The Linnæan specimens came from Dr. Patrick Browne, and answer well to Plukenet's t. 289. f. 4, whatever his t. 296. f. 2, cited by authors, may be. The *fronds* are a span high, thin, delicate and smooth, with fine interbranching angular veins. We have seen no fructification. Neither Willdenow nor Pursh appear to have examined any specimens.

Sect. 3. *Fronde pinnate*. Forty-four species in Swartz; seventy-four in Willdenow.

A. falcatum. Sickle-leaved Japanese Shield-fern. Swartz n. 7. Willd. n. 13. (*Polypodium falcatum*; Thunb. Jap. 336. t. 36, not 35. Linn. Suppl. 446. *Filix cheufanica*, latiori lonchitidis ferrato folio, averâ parte ferrugineis punctulis refertissimo; Pluk. Amalth. 93. t. 405. f. 1.)—Fronde pinnate: leaflets ovate, coriaceous, bluntly serrated, pointed, curved upwards; or oblique and unequal at the base; strongly veined beneath; the odd one somewhat three-lobed. Stalk scaly.—Gathered in Japan by Thunberg, from whom we have a specimen. Twelve or fifteen inches high, rigid; rather glaucous beneath. *Involucrum* perfectly peltate and orbicular, with a central boss. The upper side of each leaf is quite smooth and even; the under very curiously reticulated, with stout, prominent, chain-like veins, meeting, but not strictly interbranching with, each other.

A. punctulatum. Dotted-bordered Shield-fern. Swartz n. 21. Willd. n. 17. (*Lingua cervina dentata*, punctulis nigris notata; Plum. Fil. 98. t. 112.)—Fronde pinnate: leaflets uniform, linear-lanceolate, pointed, serrated; with a marginal row of minute impressions on the upper side; downy beneath.—Gathered by Plumier in Martinico. We have it from Jamaica. Willdenow moreover mentions Guinea, as the native country of this species. Each *frond* is five or six feet high. *Common stalk* round at the base, furrowed in front, light brown, not smooth, but clothed with fine, soft, narrow, rusty scales. *Leaflets* very numerous, alternate, four or five inches long and nearly one broad, slightly stalked, bright green, rather thin and pliant, unequally, and sometimes doubly, serrated; finely downy at the back; broadly wedge-shaped, and occasionally slightly auricled at the base; their upper side smooth, each vein terminating near the margin in a blueish, withered, minute spot, the seat, as it appears, of the *flowers*; for a similar mark is found over every mass of *capsules*; but these being situated in a simple row, at some distance from the margin, the spots which mark their insertion are much further from the edge than the abortive spots. Plumier represents a row of such spots on the *under* side, at every serrature. He is so supremely accurate, that we have sometimes doubted our plant being the same as his, of which there is otherwise no appearance. Every thing which may lead to the discovery of the *flowers* of ferns is so interesting, that we are here tempted to be more particular than usual. The masses of *capsules* are large, prominent, of a bright tawny-brown, each with an almost perfectly circular and umblicated *involucrum*. It seems to us a curious question, how the spots above-mentioned which are attended by fertile *capsules*, in large convex *fori*, come to be areited at a considerable distance from the edge of the leaf, while, without any difference in their size or appearance, the abortive ones are advanced almost to the base, or even the disk of each serrature.

A. Lon-

ASPIDIUM.

A. Lonchitis. Rough Alpine Shield-fern. Swartz n. 5. Willd. n. 25. Fl. Brit. n. 1. Engl. Bot. t. 797. (Polypodium Lonchitis; Linn. Sp. Pl. 1548. Fl. Dan. t. 497. Lonchitis aspera major; Ger. Em. 1140. Matth. Valgr. v. 2. 273. Camer. Epit. 664.)—Frons pinnate, chaffy: leaflets fickle-shaped, declining, acute, with fringe-like ferratures; auricled at the upper angle of their base; wedge-like at the lower.—Native of the crevices of dry rocks in alpine or subalpine situations, throughout Europe. It has been found in Scotland and Wales, but scarcely we believe in England, though starved plants of *A. aculeatum* are occasionally taken for this species. The fronds are a span high, more or less, growing in tufts, erect, lanceolate, rather narrow, or linear. Leaflets numerous, crowded, dark greyish-green, about an inch long, the upper ones, about one-third of the whole, copiously fructifying; the rest barren; several of the lowermost gradually shortened, but not contracted in breadth. Sori in a simple row on each side of the rib, rather nearer to it than to the margin, pale; the involucre of each petate and umblicated, without any notch, completely orbicular.

A. acrostichoides. Crowded Shield-fern. Swartz n. 11. Willd. n. 26. Pursh n. 2. ("A. auriculatum; Schkuhr Crypt. 31. t. 30, excluding the fynonyms." Willd. Nephrodium acrostichoides; Michaux Boreal.-Amer. v. 2. 267. Polypodium fronde pinnatâ lanceolatâ, foliis lunulatis, &c.; Gron. Virg. ed. 2. 167, excluding all the fynonyms, except Clayton's.)—Frons pinnate, chaffy: leaflets fickle-shaped; acute, with fringe-like ferratures; auricled at the upper angle of their base: uppermost diminished, covered with confluent masses of capsules.—Native of rocks, in shady low places, from New England to Carolina, bearing capsules in the summer. Pursh. This fern has long been cultivated in the more curious gardens of England, having been introduced, if we recollect aright, by Robert Barclay, esq. at Clapham. A taller plant than the last, and of a lighter green. The auricle of the lowermost leaflets sometimes becomes quite distinct and separate. The sori are found upon half, or one-third, of the upper leaflets, in a single or double row, at each side of the mid-rib, and are particularly crowded on the auricles. They become tumid as the capsules ripen, and run into one mass, studded, as it were, with the pale-brown involucre, which are circular and petlate, though cloven at one side, the edges of the finis folding over each other. Linnæus confounded this with *Asplenium ebenum*, as well as with his own *Polypodium auriculatum*, an East Indian species, hereafter described.

A. auriculatum. Auricled Shield-fern. Swartz n. 10. Willd. n. 30. Ait. n. 3? (Polypodium auriculatum; Linn. Sp. Pl. ed. 1. 1088. ed. 2. 1548. Filix zeylanica, lonchitidis facie; Burm. Zeyl. 98. t. 44. f. 2.)—Frons pinnate: leaflets lanceolate, falcate, serrated, striated; auricled at the upper angle of their base. Masses of capsules distinct, in simple rows.—Native of the rocky summits of mountains in Ceylon. König. Brought to Kew garden, in 1793, by admiral Bligh. Aiton. This species has no affinity or resemblance to the last, with which Linnæus, and after him Swartz, confounded its fynonyms and character. Even Willdenow, who corrected these errors, is mistaken in saying the stalk is smooth. The frond is from six to twelve inches high. Stalk scaly in front; roughish with minute points behind. Leaflets numerous, narrow, an inch and a quarter or an inch and a half long, tapering but not pointed, coriaceous, smooth, with fine, blunt, notched, not fringed, ferratures; even above, striated with transverse veins beneath; dilated at the base; the auricle broad, short, and

bluntish. Sori small, distinct, in an even row on each side the mid-ribs of the leaflet and its auricle. We have not seen the involucre. The ripe capsules are inserted by fine capillary stalks into a convex knob. Linnæus says in Fl. Zeyl. n. 383, where he originally defined his *Polypodium auriculatum*, that the plant is entirely smooth. The shagreened and slight roughness of the stalk may therefore be variable. He there cites Plukenet, t. 30. f. 4; which is in no respect discordant with König's specimens. Mr. Menzies gathered on the west coast of North America a fern very like this, except that the ferratures are bristly, and the leaflets less striated. Its stalk is very scaly all the way up.

A. exaltatum. Lofty Shield-fern. Swartz n. 14. Willd. n. 34; excluding the fynonym of Linnæus. Ait. n. 4. "Schkuhr Crypt. 33. t. 32. b." (Lonchitis glabra minor; Plum. Amer. 19. t. 28. Fil. 48. t. 63. L. altissima, pinnis utrinque, feu ex utroque latere, auriculatis; Sloane Jam. v. 1. 77. t. 31.)—Frons pinnate: leaflets lanceolate, serrated; with a row of minute white impressions on the upper side, towards the margin; unequally hastate at the base. Masses of capsules in a simple row, towards the margin. Stalk even, slightly scaly.—Native of Jamaica, and other parts of the West Indies. Brought to the stoves at Kew, by admiral Bligh, in 1793. The fronds are usually three or four feet high, erect, straight, narrow, with a polished, pale-brown stalk and mid-rib, occasionally somewhat shaggy. Leaflets numerous, parallel, close, nearly straight, two inches long at most, very smooth; rather rounded at the point, their shallow, blunt, unfringed ferratures most abundant in their upper half; the base dilated into two short broad auricles, destitute of fructification, of which the lower one is shortest, and most rounded. Sori numerous, distinct, rather large. Involucre not perfectly orbicular, nor strictly petate, having a deep sinus at the side towards the base of the leaflet, so as to resemble a horse-shoe. This fern is very distinct from our *Davallia falcata*, though Dr. Swartz suspected the contrary. Linnæus confounded its fynonyms with the following. The row of minute withered specks, as far as we can see, only accompany the sori, there being, in our specimens, no barren ones as in *A. punctulatum*.

A. blechnoides. Long-leaved Shield-fern. (Polypodium exaltatum; Linn. Syst. Nat. ed. 10. v. 2. 1326. Sp. Pl. ed. 2. 1549; excluding the fynonyms, and substituting the following. Filix minor, in pinnas tantum divisa, crebras non crenatas, inferiore latere auriculatas, et rotundis pulverulentis areolas averſâ parte notatas; Sloane Jam. v. 1. 86. t. 44. f. 1.)—Frons pinnate: leaflets linear-lanceolate, elongated, entire, with a rounded incurved auricle at the base on the lower side, and a slight dilatation on the upper. Masses of capsules in a double row.—Native of Jamaica, on the sides of hills. Linnæus received his specimen in Browne's herbarium, with an erroneous reference to Sloane's t. 31, which belongs to our last-described. Hence there has always been a confusion respecting these two ferns, which even Dr. Swartz could not reconcile; see his Syn. Filicum, 65, where he cites Sloane's t. 44, but ought to have added fig. 1; as fig. 2. is *Blechnum occidentale*. The specific name of *Polypodium exaltatum*, being taken from Plumier's and Sloane's accounts of the foregoing, and that being universally received as *Aspidium exaltatum*, we have not changed its denomination. That name is not at all applicable to the species before us; which is more expressly called *blechnoides*. Its height is only eighteen or twenty inches. Leaflets from four to six inches long, taper-pointed; the lower auricle of each overlapping the main stalk, and

hooked

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hooked or curved in a curious manner, not well expressed in Sloane's plate. *Sori* in double rows close to the mid-rib at each side. *Involucrum* perfectly peltate, orbicular, and entire.

Seet. 4. erroneously marked 3 by Willdenow, as is often the case in other parts of his work. *Fron*d pinnate; leaflets pinnatifid. *Involucrum* rounded, or kidney-shaped. Thirty-seven species in Willdenow. Swartz does not separate this section from the following.

A. Hippocrepis. Horse-shoe Shield-fern. Swartz n. 45. Willd. n. 46. (Polypodium Hippocrepis; Jacq. Col. v. 3. 186. Ic. Rar. t. 641. Hemionitis laciniis crispis incisa; Plum. Fil. 129. t. 150. Petiv. Fil. t. 7. f. 7.)—*Fron*d pinnate: leaflets oblong, sinuated; the upper ones confluent and decurrent; lowermost stalked, pinnatifid; segments obtuse, somewhat crenate; veins downy. *Involucrum* crescent-shaped.—Native of South America, and of Hispaniola, from whence our specimen was brought by M. Thiery de Menonville. Jacquin had living plants of this rare fern from Venezuela, and cultivated it at Vienna. The fronds are eighteen inches or two feet high, tufted, of a fine green, more or less downy, especially about the ribs and veins: their leaflets sinuated in the manner of some species of oak; the segments also sinuated, wavy, or crisped. *Sori* chiefly ranged on each side of the mid-ribs of the segments, but not being uniformly perfected, they appear irregularly scattered. *Involucrum* like a horse-shoe, to which the specific name applies.

A. unitum. United Shield-fern. Swartz n. 47. Willd. n. 57. Ait. n. 5. Schkuhr Crypt. 34. t. 33. b. (Polypodium unitum; Linn. Sp. Pl. 1548; omitting the synonym of Sloane and Plukenet. Filix pyramidalis madraspatana elegans, pinnulis ferratis; Pet. Mus. 10. n. 55. t. 1. F. zeylanica denticulata, non ramosa; Burn. Zeyl. 98. t. 44. f. 1.)—*Fron*d pinnate: leaflets linear, pinnatifid; their very numerous segments ovate, acute, combined, hairy beneath. Stalk downy in the leafy part. *Involucrum* nearly circular, with a deep notch.—Native of Tranquebar and Ceylon. *Fron*d two feet, or more, in height: smooth and nearly naked in its lower half, except a few distant small leaflets: finely downy and rusty in the upper half, and crowded with sessile, narrow, acute, linear leaflets from three to five inches long. These are composed of innumerable little convex segments, a quarter of an inch in length; smooth and veiny above; ribbed and downy beneath; appearing as if deeply separated, but their edges are firmly united for one-half or three-quarters of their length. Near the margins of these segments are simple rows of smooth horse-shoe like *involucrums*, covering numerous capsules with glittering brown rings.

A. obtusatum. Blunted Shield-fern. Swartz n. 30. deacr. 248. Willd. n. 58. (Pteris interrupta; Willd. Phytogr. 13. t. 10. f. 1.)—*Fron*d pinnate: leaflets linear, pointed, slightly pinnatifid; segments obtuse, downy beneath. Stalk smooth. Frustrification near the margin.—Native of the East Indies. Very like the last, but the leaflets are more pointed, rather crenate than pinnatifid, and the rows of *sori* so near the margin that Willdenow actually took the plant for a *Pteris*!

A. Oreopteris. Heath Shield-fern. Swartz n. 39. Willd. n. 70. Fl. Brit. n. 3. Engl. Bot. t. 1019. "Schkuhr Crypt. 37. t. 35, 36." (Polypodium Oreopteris; Ehrh. Crypt. n. 22. Dickl. Tr. of Linn. Soc. v. 1. 181. Fl. Dan. t. 1121. P. Thelypteris; Hudf. 457. Bolt. Fil. 40. t. 22. f. 1, 2. Hedw. Theor. 44. t. 6.)—*Fron*d pinnate: leaflets lanceolate, pinnatifid, entire, besprinkled

with resinous glands beneath. Frustrification near the margin, confluent.—Mountainous heathy ground, and dry woods, in various parts of Europe, from Denmark to Italy, produce this fern, bearing capsules in July. Our British botanists long overlooked it, as a variety of the common *Filix mas*, whilst others mistook it for *Thelypteris*. The resinous dots at the back of the frond exhale a fragrant smell, more or less perceptible at different times; which induces a suspicion that this species may have been taken by Mr. Hudson for *Polypodium fragrans* of Linnæus, never found in our island. In size the present species vies with *A. Filix mas*, hereafter to be described, but the whole frond is rather narrower. The segments of the leaflets usually quite entire, are occasionally somewhat crenate about their rounded obtuse points. *Sori* crowded, in a simple row near the margin, at length confluent, forming a beaded line. *Involucrum* small and thin, umbilicated, with a deep lateral sinus, and soon vanishing. *Root* large, scaly, tufted, not creeping.

A. Thelypteris. Marsh Shield-fern. Swartz n. 39. Willd. n. 74. Fl. Brit. n. 2. Engl. Bot. t. 1018. Pursh n. 4. "Schkuhr Crypt. 51. t. 52." (Polypodium Thelypteris; Linn. Mant. 505. Fl. Dan. t. 760. Acrotichum Thelypteris; Linn. Sp. Pl. 1528. Bolt. Fil. 78. t. 43, 44. Thelypteris non ramosa; Schmidl. Ic. t. 11. Filix tenuissimè et profundè denticulata Montebalgardica; Bauh. Hist. v. 3. 731, good. F. palustris repens, pinnulis non dentatis; Morif. sect. 14. t. 4. f. 17, 1.)—*Fron*d pinnate: leaflets lanceolate, pinnatifid, somewhat crenate; distinct, but crossing each other, at the base. Frustrification scattered, confluent. *Root* thread-shaped, creeping.—Native of rotten bogs, and turfy marshes on a sandy soil, in various parts of the north of Europe, as well as in North America. Mr. Pursh says the frustrification is very rare in the latter country: with us it is but sparingly produced, the plant increasing most by the roots, which are long, slender, and creeping. The fronds are not half the size of the last, and much more delicate; their height about a foot, their colour bright grass-green. Leaflets generally smooth; sometimes a little hairy; the lowest lobe of each extended, so as to fold over the opposite one. Frustrification, if present, abundant, confluent, blackish.

A. cristatum. Lesser Crested Shield-fern. Swartz n. 49. Willd. n. 79. Sm. Compend. Fl. Brit. 157. Engl. Bot. t. 2125, not 1949. Pursh n. 5. "Schkuhr Crypt. 39. t. 37." (Polypodium cristatum; Linn. Sp. Pl. 1551. Afzel. in Stockh. Transf. for 1787. 248. t. 9. P. Callipteris; Ehrh. Crypt. n. 53.)—*Fron*d pinnate, nearly bipinnate: segments ovate, obtuse, crenate or pinnatifid, with sharp little terminal teeth. Stalk scaly at the base. *Involucrum* nearly orbicular, with a deep notch.—Native of Sweden, Germany, and England, as well as North America, in low boggy woods and thickets. Found by the Rev. R. B. Francis, on the heath between Holt and Hempstead, Norfolk. The root is tufted, as in *A. Oreopteris*, not creeping like that of *Thelypteris*, and the whole habit and texture of the fern more resembles the first of these two species. Fronds pale green, from one to two feet high; the fertile ones remarkably erect; their barren leaflets shorter and rather more distant, than those which bear frustrification, the latter composing the upper half of the frond; all are very deeply pinnatifid, sometimes to the very rib, their segments, or partial leaflets, close, broad, obtuse, with sharp, scarcely spinous, teeth. Ribs somewhat zigzag. Capsules blackish when fresh, with a white circular *involucrum* to each assemblage, having a deep sinus at the lower side; but the

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dried *sori* are tawny. *Common stalk of the frond* chiefly scaly at the bottom. Mr. Pursh considers Willdenow's *lancastriensis*, n. 97, as a variety of this.

A. fragrans. Fragrant Shield-fern. Swartz n. 42. Willd. n. 80. (Polypodium fragrans; Linn. Sp. Pl. 1550. Dryopteris rubum idæum spirans; Amman. Ruth. 174. n. 251.)—Frond pinnate: leaflets lanceolate, crowded, deeply pinnatifid; segments elliptic-oblong, bluntly and deeply toothed; stalks and mid-ribs scaly. Fructification crowded. Involucrum nearly orbicular, with a deep notch.—Native of hilly situations in Siberia, near the rivers Angara and Selenga. The inhabitants are said to boil this fern with their beer, in order to give that liquor the taste and smell of Raspberries, which is so powerful in the plant, that even in a dried state its odour fills the room where it is kept. The root is tufted, very scaly. *Fronde* several, a span high, lanceolate, tapering at each end, the lower leaflets being gradually much shortened. *Stalk* short, bearing large, rounded, lax scales; those on the leafy part, as well as on the mid-rib of each leaflet, being lanceolate and acute. The upper side of the leaflets is perfectly smooth; their lobes and indentations peculiarly elegant, without any terminal bristles. *Sori* so crowded about the lower half of each leaflet, that their expanded involucrems sometimes touch, or fold over each other, being moreover intermixed with rusty membranous scales.

SECT. 5, marked 4 by Willdenow. *Frond* doubly or triply pinnate. Involucrum rounded or kidney-shaped. Forty species in Willdenow. The involucrum in this, as well as the preceding section, though, for the most part, laterally inserted, is often nearly or completely orbicular, and it is even strictly peltate in *A. aculeatum* and *lobatum*. Some of professor Willdenow's species, adopted from Plumier's plates only, appear to us scarcely certain in genus,—such are *A. nenorosum*, Willd. n. 83, *vellem*, n. 84, and *squamatum*, n. 87.

A. aculeatum. Common Prickly Shield-fern. Swartz n. 53. Willd. n. 92. Fl. Brit. n. 5. Engl. Bot. t. 1562. Pursh n. 7. "Schkuhr Crypt. 41. t. 30." (Polypodium aculeatum; Linn. Sp. Pl. 1552. Mill. Illust. t. 101. Bolt. Fil. 48. t. 26.)—Frond doubly pinnate: leaflets ovate, somewhat falcate, stalked, with prickly serratures; hairy beneath. Common stalks and ribs scaly. Involucrum peltate, entire.—Found in shady woods and hollows, throughout Europe, as well as in Africa, and North America, bearing seed in summer and autumn. The root is large and tufted, producing numerous dark-green fronds, usually two or three feet high, spreading in a circular manner, varying much in size; paler beneath; their general and partial stalks remarkably scaly. *Partial leaflets* about a quarter of an inch long, rigid or coriaceous, each tapering down into a small short footstalk; their points and serratures each tipped with a little spinous bristle; their upper edge at the base dilated, more or less, in a broadish auricle. *Sori* plentiful on the upper part of the frond, but in single rows, and distinct, brown. Involucrum pale brown, orbicular, peltate, at length deeply umbilicated, quite entire all round, as in *A. Lonchitis*, to which this species and the following are closely allied, though all three are very distinct.

The late Mr. Rob. Teesdale, (see TEESDALIA,) found in many parts of England, a variety of this, which he suspected might prove a distinct species. It is softer, and more delicate in texture, than the common kind, with smaller, more copious, *partial leaflets*, which are more remarkably stalked, and their auricles are larger, broader, and different in aspect. This lay in Mr. Rose's herbarium for *A. lobatum*,

which it certainly is not, the *partial leaflets* being even less decurrent than in our common *aculeatum*. It may probably be the variety β of *Fl. Brit.* figured in Plukenet, t. 180. f. 1, which figure represents well enough the general appearance of the frond, and shape of the leaflets; but their partial stalks are much more considerable and evident than they appear in that plate. *A. aculeatum*, if transplanted into a dry open situation, soon diminishes greatly in size, so as to resemble *A. Lonchitis*, for which we once received it; but these species are nevertheless essentially different, as any careful investigator will find.

A. lobatum. Close-leaved Prickly Shield-fern. Swartz n. 54. Willd. n. 95. Fl. Brit. n. 6. Engl. Bot. t. 1563. (Polypodium lobatum; Hudf. 459. Filix aculeata major, pinnulis auriculatis crebrioribus, foliis integris angustioribus; Raii Syn. 121. F. aculeata, Lonchitidis æmula nostras; Pluk. Phyt. t. 180. f. 3.)—Frond doubly pinnate: leaflets elliptical, somewhat falcate, decurrent, with prickly serratures; hairy beneath: the foremost of the lowest pair very large. Common stalks and ribs scaly. Involucrum peltate, entire.—Found in shady places, under hedges, in England; not unfrequent in the county of Essex, where Ray first noticed this species, and from whence Mr. Edward Forster has sent us specimens. The Rev. Mr. Francis has met with it at Edgefield, near Holt, Norfolk. There is no record of this fern being found out of Britain. The fronds are always of a narrower, more linear, form than the last, and generally altogether smaller, as well as more rigid, of a paler more shining green. Leaflets rather elliptical than ovate, and Mr. Dawson Turner has well observed that they are decurrent, not stalked, which is perhaps one of the most certain means of distinguishing this species from *A. aculeatum*. The most striking character, indicated by the specific name, consists in the great size, and angular-lobed figure, of the lowest *partial leaflet*, on the upper side of each general leaflet or pinna, close to the main stalk, often extending beyond the pinna above it. The upper half of the frond, principally, is covered with fructification. The involucrum is perfectly peltate, entire; finally umbilicated.

A. marginale. Marginal-flowering Shield-fern. Swartz n. 41. Willd. n. 93. Ait. n. 11. Pursh n. 8. "Schkuhr Crypt. 195. t. 45. b." (Polypodium marginale; Linn. Sp. Pl. 1522. Nephrodium marginale; Michaux Boreal.-Amer. v. 2. 267.)—Frond doubly pinnate; leaflets oblong, obtuse, decurrent, crenate; almost pinnatifid at the base. Masses of capsules marginal. Involucrum orbicular, with a lateral sinus.—In rocky shady places, from Canada to Carolina, bearing capsules in July. This species has often been supposed a native of Britain, *A. Oreopteris*, whose fructification is likewise marginal, having been taken for it; but the American plant is very distinct, more resembling *Filix mas* than any other. The *marginale* however is a smaller plant, the upper half of whose frond only bears fructification, and the leaflets are bluntly crenate, instead of being sharply serrated. They are moreover not uniform, as in *Filix mas*, but the lower ones of each pinna are larger and more or less pinnatifid. Involucrum tumid, corrugated, forming a complete circle, though not peltate.

A. Filix mas. Male Shield-fern. Swartz n. 59. Willd. n. 94. Fl. Brit. n. 4. Engl. Bot. t. 1458. Pursh n. 9. "Schkuhr Crypt. 45. t. 44. also *A. erofum*, t. 45, and *A. depauperum*, t. 51," according to Willdenow. (Polypodium Filix mas; Linn. Sp. Pl. 1551. Bolt. Fil. 44. t. 24. Woodw. Med. Bot. t. 49. Filix mas vulgaris; Ger. Em. 1128. Fuchf. Hist. 595. Matth. Valgr. v. 2. 626. Camer. Epit. 991.)—Frond doubly pinnate: leaflets oblong, obtuse, fessile,

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fessile, sharply ferrated without prickles, uniform. Masses of capsules crowded towards the rib and base of each leaflet. Involucrum orbicular, with a lateral sinus.—Very common throughout Europe, as well as in the northern parts of Asia, Africa, and America, in shady situations, under dry banks, bearing seed about July and August. The root is tufted and fealy, often very large. Fronds numerous, bright green, about a yard high, and a span wide, their stalks and principal rib fealy; the rib of each leaflet is sometimes a little hairy, and slightly bordered, though the partial leaflets are scarcely decurrent, except the uppermost. The fructification is abundant over great part of the frond, of a rich tawny-brown, crowded, not confluent. Involucrum tumid, umbilicated, with a lateral notch, which is rather more open than in *A. marginale*, but not quite so deep. The root is a celebrated cure for intestinal worms, in Switzerland and other parts of the continent; and its nauseous taste may, as we understand, be detected in one or more of the popular quack medicines, which in this country obtain credit by puffing advertisements, whose truth it is easier to believe than to examine. Happy if they are never composed of more dangerous materials than the root of the Male Fern!

A. spinulosum. Lesser Crested Shield-fern. Fl. Brit. n. 8. Engl. Bot. t. 1460. Swartz n. 58. Willd. n. 99. Pursh n. 11? "Schkuhr Crypt. 48. t. 48." (Polypodium spinulosum; Retz. Prodr. 250. Fl. Dan. t. 707. P. n. 841; Mull. Friedr. 193. t. 2. f. 2. Filix pumila faxatilis altera; Pluk. Phyt. t. 179. f. 5.)—Frond doubly pinnate; leaflets decurrent, elliptical, confluent, with deep-cut prickly ferratures. Mid-rib smooth. Nerves zigzag. Involucrum orbicular, with a lateral sinus.—Native of boggy shady places, in various parts of Europe; as well as in North America, if Mr. Pursh be right; but he speaks of his plant as "a large species;" ours is certainly rather small, not above a foot high. The root is creeping. Frond broad, with a long stalk, which is fealy in the lower part only. Partial leaflets elliptic-oblong, of an elegant bright pellucid green, with wavy ribs; decurrent, so as to form a border to the partial stalk. Dots of capsules small, and rather distant. Involucrum small, soon pushed to one side. We see nothing in it of a glandular nature, as mentioned by Willdenow.

A. dilatatum. Great Crested Shield-fern. Fl. Brit. n. 9. Engl. Bot. t. 1461. Willd. n. 100. Pursh n. 12. (Polypodium dilatatum; Hoffm. Germ. v. 2. 7. P. aritatum; Villars Dauph. v. 3. 844. Bellardi in Act. Taurin. v. 5. 255. P. cristatum; Ehrh. Crypt. 81. Hudf. 457. Bolt. Fil. 42. t. 23. P. n. 845; Mull. Fl. Freidr. 193. t. 2. f. 4. Filix mas ramofa, pinnulis dentatis; Raii Syn. 124. Pluk. Phyt. t. 181. f. 2. F. mas, pinnulis cristatis; Morif. sect. 14. t. 3. f. 11.)—Frond doubly pinnate; leaflets deeply pinnatifid, sharply cut, with prickly teeth and ferratures. Stalk and branches fealy. Involucrum kidney-shaped, soon orbicular, with a lateral sinus.—Native of shady watery places, sometimes on dry banks, in a sandy or gravelly soil, or in stony moist woods, throughout Europe. Mr. Pursh met with this species in the shady rocky woods of Pennsylvania and Virginia. The root is tuberous or tufted, scarcely creeping. Fronds generally two feet, or more, in height, though sometimes much smaller. Their broad, much compounded, form and structure, and their bright-green colour, give them a very handsome aspect. They are often triply pinnate, or at least their ultimate subdivisions are so deeply separated as to cause that appearance; these are pretty uniform, with deep, sharp, prickly-toothed ferratures and points. Stalks, ribs, and veins, a little downy, or glandular; none of them zigzag, or at most very slightly so. Fructification

copious all over the frond, rather crowded, not confluent, of a bright brown. Involucrum at first kidney-shaped, tumid, but soon becoming orbicular, the sinus nearly closing, retaining only an umbilicated depression, and at length the membrane remains folded together vertically, in the centre of the mass of capsules.

Sect. 6, marked 5 by Willdenow. Frond either doubly pinnatifid, or doubly or triply pinnate. Involucrum lateral. Twenty-six species in Willdenow; nineteen in Swartz. These are perhaps most entitled to constitute a distinct genus, but in several instances they too nearly approach the last section to admit of a clear generic definition.

A. fontanum. Smooth Rock Shield-fern. Swartz n. 74. Willd. n. 122. Engl. Bot. t. 2024. (Polypodium fontanum; Linn. Sp. Pl. 1550. Fl. Brit. 1114. Hudf. 456. Villars Dauph. v. 3. 849. P. n. 1706; Hall. Hist. v. 3. 15. Adiantum filicinum durius crispum minimum; Barrel. Ic. t. 432. f. 1. Filicula faxatilis, omnium minima, elegantissima; Tourn. Inst. 542. Pluk. Phyt. t. 89. f. 3.)—Frond linear-lanceolate, smooth, simply or doubly pinnate; leaflets alternate, rounded, their segments very sharply toothed. Stalks winged. Involucrum oblong.—Native of rocks in England, France, Switzerland, and other parts of Europe, but very rare in this country. Mr. Hudson, and the late Mr. Aiton, to our certain knowledge, have gathered it on Amerham church, Buckinghamshire, where it is no longer, as we are told, to be met with. Linnæus confounded this fern with what is now named *WOODSIA hyperborea* (see that article); nor has it been well understood by botanists in general, being of rare occurrence, obscure in its generic character, and very variable in luxuriance. This may be seen by comparing Plukenet's figure above cited, fig. 3, with his fig. 2, quoted by Willdenow, after Fl. Brit. which last is we believe the same plant, but not under its usual and most natural appearance. When once seen in perfection, this truly elegant little fern can be confounded with no other. The root is tufted. Fronds from two to six inches high, rigid, smooth, rather glaucous, of a narrow lanceolate figure, composed of numerous, alternate, pinnate or pinnatifid leaflets, whose partial leaflets, or lobes, are wedge-shaped, somewhat stalked, with deep, very sharp, in some degree spinous, teeth, and all the stalks are winged. Masses of capsules at the mid-rib of each lobe, round, or nearly so, with a delicate white involucrum originating from the rib, by a straight lateral insertion, and separating inwards, that is, towards some other more principal rib, not towards the margin. Perhaps this plant is truly an *Asplenium*. Professor Willdenow has an *A. Halleri*, n. 125, which he considers abundantly distinct from *fontanum*, but to which he refers some of our above-mentioned synonyms. We have Haller's plant from Switzerland, and are perfectly certain of its being the same as our *fontanum*, though we have not the means of verifying all Willdenow's synonyms.

This writer, whose labours respecting *Filices* will ever do his memory great honour, notwithstanding errors unavoidably incident to so difficult an enterprise, has, after the example of Swartz, associated with this tribe some species which we refer to *CYATHIA*. (See that article, written by the late Rev. Mr. Wood.) These are, *C. dentata*, *fragilis*, and *regia* of Fl. Brit. and Engl. Bot.; there being also several exotic species in the same predicament. Some of them come very near *A. fontanum*, just described, in the character of their involucrum, but they ill accord with the rest of this genus. A few species, now to be mentioned, perhaps connect them therewith. We shall select such as are most likely to elucidate the subject.

A. bulbiferum. Bulbiferous Shield-fern. Swartz n. 82. Willd. n. 126. Ait. n. 20. Pursh n. 13. "Schkuhr Crypt. 55. t. 57." (Nephrodium bulbiferum; Michaux Borealis. Amer. v. 2. 268. Filix bacifera; Cornut. Canad. 5. t. 4. Barrel. Ic. t. 1120. Morif. sect. 14. t. 3. f. 10.)—Frons doubly pinnate, oblong-lanceolate: leaflets ovate, obtuse, pinnatifid or deeply ferrated; upper ones confluent. Ribs bulbiferous.—Found in shady woods, among rocks, from Canada to Pennsylvania. *Parvif.* The frond is about eighteen inches high, narrow, bright-green, smooth, delicately cut; *partial leaflets* half an inch long at most, decurrent. Masses of *capsules* mostly scattered, small, round. The *involucrum* seems concave, almost hemispherical, turning to one side; but our specimens are not sufficient to ascertain its exact figure. Several of the secondary ribs bear fleshy bulbs, that fall off and become young plants, of which there are instances in WOODWARDIA, (see that article,) and some other ferns.

A. Filix foemina. Female Shield-fern. Swartz n. 83. Willd. n. 128. Fl. Brit. n. 7. Engl. Bot. t. 1459. "Schkuhr Crypt. 56. t. 58, 59." (Polypodium Filix foemina; Linn. Sp. Pl. 1551. Bolt. Fil. 46. t. 25. Filix mas non ramosa, pinnulis angustis raris, profundè dentatis; Raii Syn. 121. Pluk. Phyt. t. 180. f. 4. Morif. sect. 14. t. 3. f. 8.)—Frons doubly pinnate: leaflets pinnatifid, ferrated, pointless, oblong-lanceolate. Stalk smooth. Dots oblong. Involucrum somewhat kidney-shaped.—A common fern throughout Europe, in marshy shady places, varying greatly in dimensions, but of a broadish-oblong figure, from one to two feet high, of a fine dark green, and very smooth. *Stalk* slender, pale, smooth, somewhat angular. *Leaflets* innumerable, tolerably uniform, delicately cut, bluntish, without any terminal bristles. *Masses of capsules* covering the frond, one upon each segment of the leaflets, inserted laterally into its minute mid-rib, oblong, the *capsules* dark brown. *Involucrum* separating towards some larger adjoining rib, oblong, white, jagged or fringed, sometimes quite straight at the insertion, sometimes kidney-shaped, but always finally assuming the latter form, as the *capsules* advance and cause it to turn back.

A. irriguum. Brook Shield-fern. Engl. Bot. t. 2199. Compend. Fl. Brit. 156.—Frons lanceolate, pinnate: leaflets deeply pinnatifid, cut and sharply toothed. Stalk quadrangular. Involucrum lateral, short, jagged.—Found by T. F. Forster, eq. about the boggy margins of clear springs, near Tunbridge Wells, in June. Akin to the last, and in some degree to *A. Thelypteris*, but much smaller and more delicate than either. *Stalk* and *main rib* exactly square, somewhat scaly, pellucid. *Leaflets* deeply pinnatifid, not pinnate; their lobes most like those of *A. Filix foemina*. *Masses of capsules* small, round. *Involucrum* white, inserted as in the last, but shorter, extremely delicate, jagged and fringed, very slightly kidney-shaped, and rather hemispherical, somewhat resembling *Cyathea fragilis*.

A. alpinum. Fine-cut Alpine Shield-fern. Swartz n. 89. Willd. n. 139. "Schkuhr Crypt. 60. t. 62, a, b." (Polypodium alpinum; Jacq. Coll. v. 2. 171. Ic. Rar. t. 642. P. n. 1709; Hall. Hist. v. 3. 15. Filicula alpina crispata; Bauh. Pin. 358. Segu. Veron. suppl. 55. t. 1. f. 3. Morif. sect. 14. t. 4. f. 27. Felce crepso lassifolia; Pon. Bald. 224. with a figure.)—Frons triply pinnate: leaflets linear-wedge-shaped, pinnatifid, confluent; their segments linear, obtuse, emarginate.—Found on the alpine rocks of Carinthia, Switzerland, France, and the north of Italy. A very slender delicate fern, from six to ten inches high, smooth, bright green, sometimes assuming a tawny hue. The frond is linear-

lanceolate; the ultimate segments peculiarly narrow and linear, alternate, sharply cloven at the end, but otherwise entire; tapering down into the linear bordered stalk, quite smooth and naked, single-ribbed. Every segment bears one small round mass composed of a very few *capsules*, rather large in proportion, each having a shining ring. The *involucrum* is very thin, white, and membranous, represented by Wulfen and Jacquin as perfectly peltate, without any notch, and attached by a fine central thread. This would make the plant a most indubitable *Alpidium*. But in our specimens, from Jacquin himself, the *involucrum*, turned aside by the ripe *capsules*, remains in the form of a thin concave or vaulted scale, or scales, attached laterally beneath them, as in some of our British *Cyathea*, without any peltate appearance. Unfortunately we have no fructification in a sufficiently early state to verify Wulfen's description or Jacquin's figure. We rely on Seguir and Haller for Pona's, and consequently Morison's, synonym, though the figure suggests some idea of *Cheilanthes suaveolens* of Swartz and Willdenow, which Pona's account of the blackish or dark-coloured hue of the root, and upper part of the frond, rather confirms. Seguir's plate, though deficient of fructification, is sufficiently accurate, and cannot be disputed.

A. montanum. Chervil Shield-fern. Swartz n. 91. Willd. n. 147. "Schkuhr Crypt. 61. t. 63." (Polypodium montanum; Lamarck Franc. v. 1. 2. Allion. Pedem. v. 2. 287. Hæncke in Jacq. Coll. v. 2. 46. P. myrrhidifolium; Villars Dauph. v. 3. 851. t. 53, excluding Plukenet's synonym. P. n. 1710; Hall. Hist. v. 2. 16.)—Frons ternate, pentagonal, triply pinnate: segments elliptic-oblong, obtuse, slightly toothed at the end, decurrent.—Native of the mountains of Austria, the Tyrol, Switzerland, Italy, and France. The name given by Villars is infinitely preferable to the unmeaning one which this elegant species has been suffered to retain. It differs from all we have hitherto described of this section, in the pentagonal outline of the frond. The colour is a light green. Ultimate leaflets, or segments, not linear, but rather elliptical, very small and delicate. *Sori* solitary on each segment or lobe, small, globose, of rather numerous brown *capsules*, entirely covered, while young, with a white, pellucid, hemispherical *involucrum*, which turns gradually back, remaining attached, at one side, under the capsules, like half the cup of a true *Cyathea*.

A. odoratum. Scented Shield-fern. Willd. n. 146.—"Frons ternate, doubly pinnate: leaflets oblong, obtuse, hairy, deeply ferrated; ferratures blunt, with two teeth. Root chaffy."—Gathered by M. Bory de St. Vincent, on rocks in the island of Mauritius. Root as thick as the thumb, springing from the fissures of rocks, densely clothed with brown, oblong-lanceolate, very long-pointed, entire, brown, chaffy scales, half an inch in length. *Stalk* three or four inches long, smooth. *Ribs* hairy. *Branches* of the frond four or five inches long. *Leaflets* linear, oblong, obtuse, clothed on both sides with short hairs; their lower ferratures mostly with four teeth. *Willdenow*. The composition of the frond seems to agree with the last, as being ternate, a character we have not observed in any others. This structure gives the whole a pentagonal shape, very different from the oblong or lanceolate figure of the greater part of this genus.

ASSIUT, in Geography. See STOUT.

ASTELLA, in Botany, a name originally given by Sir Joseph Banks and Dr. Solander, formed from *a, without*, and *stellas, a little pillar*, because of the want of a style, which distinguishes this genus from several of its natural allies.

—Brown

—Brown Prodr. Nov. Holl. v. 1. 291.—Clafs and order, *Hexandria Trigynia*. Nat. Ord. between the *Apbodeli* and *Junci* of Juff. *Brown*.

Gen. Ch. *Cal.* none, unlefs the corolla be fo called. *Cor.* of one petal, in fix deep, equal, ovate, half-membranous, permanent fegments. *Stam.* Filaments fix, awl-shaped, about the length of each fegment, and inferted into its bafe; anthers roundifh, of two lobes. *Pift.* Germen fuperior, ovate, pointed; ftyles none; ftigmas three, obtufe. *Peric.* Berry ovate, more or lefs perfectly three-celled. *Seeds* numerous, elliptic-oblong, fomewhat triangular, polished. *Receptacles* three, attached longitudinally to the coat of the berry. Some flowers have imperfect ftamens, and others, on a feparate plant, an imperfect *piftil*.

Efl. Ch. *Calyx* none. *Corolla* in fix deep, equal, half-membranous fegments, bearing the ftamens. *Styles* none. *Stigmas* obtufe. *Berry* fuperior, with many *feeds*.

The habit of the plants of this genus refembles *TILLANDSIA*, (fee that article,) and they in like manner fometimes grow on the living or dead trunks of trees. The roots are fibrous. Radical leaves imbricated in three rows, either linear-lanceolate, or fword-shaped, keeled, furnished, on one or both fides, with clofe, compressed, fhaggy hairs; their bafe with filky wool. *Stem* very fhort or none, with few leaves. *Flowers* fmall, filky externally, racemofe, or panicled, rarely alfo folitary; their partial stalks without a joint, and having each a folitary bractea at its bafe.

Mr. Brown thinks *Aftelia* not nearly allied to any other genus, though fomewhat approaching *Tillandfia*. The New Zealand plants, upon which fir Jofeph Banks and Dr. Solander founded this genus, differ from the folitary fpecies which grows in Van Diemen's ifland, in having a berry of three cells: two fpecies moreover have a pitcher-shaped fix-cleft calyx, (*corolla*, as we term it,) which in another is pulpy. Should the genus therefore be divided? *MELANTHIUM pumilum* (fee that article n. 9.) appears to be an *Aftelia*. *Brown*.

The learned author defines one fpecies only.

A. alpina. Alpine *Aftelia*. Br. n. 1.—“Leaves ftraight, filky on both fides. Clufter divided in the lower part; its branches bearing few flowers. Berries oval, fingle-celled. Flowers with fix deep fegments.”—Gathered by Mr. Brown, on mountains in the ifland of Van Diemen.

To this we are enabled to add the following.

A. Menziefiana. Many-flowered *Aftelia*.—Leaves ftraight; filky beneath. Stalk fhaggy. Clusters panicled, many-flowered. Berry ovate, three-celled. Flowers in fix deep fegments.—Gathered in the Sandwich iflands, by Mr. Menzies, to whom we are obliged for a fpecimen. The leaves are all nearly, or quite, radical, eighteen inches long, a half or three-quarters of an inch broad, taper-pointed, entire, ftrongly ribbed; fmooth and green above; pale, and filky with fhining clofe hairs, beneath. *Stalk* folitary, nearly as tall as the leaves, round, denfely clothed with pale, fhaggy, fhining wool; fimple below; panicled at the top, with many hairy clufter, each two or three inches long. Segments of the corolla hairy at the back. *Berries* the fize of a currant, pointed, each containing feveral large, black, fhining feeds.

To thefe are to be added the New Zealand fpecies, not yet publifhed, which, by Mr. Brown's remarks, appear to be at leaft three in number; and probably alfo the above-mentioned *Melanthium*.

ASTEPHANUS, from α , without, and $\sigma\tau\epsilon\phi\alpha\nu\sigma$, a crown, becaufe of the want of the crown to the ftamens, ufual in this order.—Brown in Wern. Tranf. v. 1. 54.—Clafs and

order, *Pentandria Digynia*. Nat. Ord. *Contorte*, Linn. *Apocineae*, Juff. *Afclepiadeae*, Brown.

Efl. Ch. *Corolla* nearly bell-fhaped; mouth and tube without fcales. Crown of the ftamens none. Anthers tipped with a membrane. Maffes of pollen pendulous. *Follicles*

Perennial, generally twining, plants, of fouthern Africa, with oppofite leaves. *Umbels* lateral, between the footstalks. *Flowers* fmall.

This genus is founded on *Apocynum triflorum* and *lineare*, Linn. Suppl. 169, with two new fpecies in the Banksian collection. *A. cordatum* and *lanceolatum*, Thunb. Prodr. 47, probably belong to it. The character is alfo modified fo as to admit a very remarkable plant, found by Mr. Maffon in the fame country, whose *stem* is shrubby, with fpinefcent branches; leaves extremely minute, oppofite, diftant, and heart-fhaped. *Corolla* rather urceolate than bell-fhaped; the orifice of the tube furnished with deflexed hairs. Maffes of pollen fixed by their tapering fummits. *Stigma* blunt. *Follicles* nearly cylindrical, fmooth. The whole genus differs from *MICROLOMA* chiefly in the want of fcales within the tube. Mr. Brown thinks they might be united, but this would lead to the junction alfo of *METASTELMA*, which being of Weft Indian origin, he was unwilling to join it with Cape plants. We fhould have thought the laft objection might have been overruled by fo near an agreement of character. See the two articles in queftion.

ASTERABAD, in *Geography*, a fmall province of the Perfian empire, fometimes included in Mazanderan, which it refembles in appearance, climate, and productions. It is the ancient Hyrcania; bounded on the W. by the Cafpian fea; on the S. feparated by a lofty ridge of mountains from the diftricts of Damgan and Biftan; extending to the E. as far as longitude 58°, and divided from Daheftan by the river Afhor. The capital of the fame name is fituated near the mouth of the river Eftar, on a bay of the Cafpian fea. E. of the capital, in which much treasure is faid to be deposited, and 25 furlongs from Biftan, is the town of Jorjan, the ancient Hurkaun, from which the name Hyrcania may probably be derived. See *ASTRABAD*.

ASTROLOMA, in *Botany*, fo called from $\alpha\sigma\tau\epsilon\rho\varsigma$, a ftar, and $\lambda\omicron\mu\omicron\sigma$, a fringe, alluding to the five tufts of hair, which form a ftar, near the bottom of the tube of the flower, internally.—Brown Prodr. Nov. Holl. v. 1. 538. (*Vintennatia*; Cavan. Ic. v. 4. 28.)—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Ericae*, Juff. *Eparicideae*, Brown.

Gen. Ch. *Cal.* Perianth inferior, permanent, double; inner of five elliptic-lanceolate, acute, equal, erect leaves; outer of four or more, much fhorter, concave, imbricated fcales. *Cor.* of one petal, tubular; tube twice the length of the calyx, inflated, furnished on the infide, near the bafe, with five tufts of foft hairs; limb in five deep, fpreading, lanceolate, acute, hairy fegments, fhorter than the tube. Nectary a cup-fhaped undivided gland, furlounding the bafe of the germen. *Stam.* Filaments five, linear, inferted into the tube, and enclosed within it; anthers oblong, in the mouth of the tube. *Pift.* Germen fuperior, roundifh, of five cells; ftyle capillary, the length of the tube; ftigma “globofe, denfely downy.” *Cavan.* *Peric.* Drupa globular, flightly juicy. *Seed.* Nut of five cells, hard and folid, not burfting, with a pendulous oblong kernel in each cell.

Efl. Ch. Outer calyx of feveral imbricated leaves. *Corolla* tubular; tube fwelling, twice as long as the calyx, with five internal tufts of hair at the bafe; tube fhorter, fpreading, bearded. Filaments linear, within the tube. *Drupa* almoft dry, of five cells.

This

This genus is very closely related to *STENANTHERA*, as well as to *MELICHRUS*. (See those articles.) We might perhaps safely unite them all to *STYPHELIA*. The opinion of Mr. Brown, however, who has examined them in a fresh state, deserves all possible attention, and we have therefore followed his views of the subject. *Astroloma* consists of shrubs, of humble stature, for the most part decumbent. Leaves scattered, often ciliated. Flowers axillary, erect. Six species are mentioned by this author, under the following characters.

1. *A. humifusum*. Diffuse *Astroloma*. (*Vintenatia humifusa*; Cavan. Ic. v. 4. 28. t. 348.)—Stem prostrate, much branched. Leaves linear-lanceolate, fringed with minute bristles; slightly convex on the upper side.—Found in various parts of New Holland, on the south-west coast, as well as at Port Jackson, and in Van Diemen's island. We have not heard of this plant, nor any other of its genus, in the gardens of Europe. The stems are a foot, more or less, in length, round, spreading flat on the ground, and sending up numerous, crowded, erect, short, leafy branches. Flowers on the main stems and branches, axillary, solitary, sessile, an inch long, of a fine crimson, with a glaucous, somewhat rose-coloured, calyx. *Drupe* nearly the size of a pea, reddish, smooth, almost concealed in the permanent calyx. The abbé Cavanilles dedicated this plant, as a distinct genus, to the honour of M. Ventenat, though he made a mistake in its orthography. But there is another *VENTENATIA*, of which the reader may find an account in its proper place. The remaining five species have all been found in the southern part of New Holland, by Mr. Brown, and apparently by no other botanist. We give their names and definitions from his work.

2. *A. prostratum*. Prostrate *Astroloma*.—Stem prostrate, much branched. Leaves linear-lanceolate, fringed; flat above; rather convex beneath.—Seen with unexpanded flowers only, by Mr. Brown.

3. *A. denticulatum*. Toothed *Astroloma*.—Stem procumbent, or somewhat erect. Leaves lanceolate, flat, fringed, with hairs dilated at their base.

4. *A. pallidum*. Pale *Astroloma*.—Stem diffuse, with ascending branches. Leaves lanceolate, sessile, fringed, imbricated; slightly concave on their upper side.

5. *A. compactum*. Compact *Astroloma*.—Stem diffuse, with very short ascending young branches. Leaves obovato-lanceolate, fringed; rather concave on their upper side; tapering at the base into short footstalks.

6. *A. tetrum*. Upright *Astroloma*.—Stem erect, somewhat branched. Leaves lanceolate-oblong, flat, imbricated; rough-edged; their teeth minute, very short, obtuse.

ATHENS, in *Geography*, l. 4, r. 478. Add—Also, a township of Maine, in the county of Somerset, with 374 inhabitants.—Also, a township of Pennsylvania, in Lycoming county, having 759 inhabitants.—Also, a county of Ohio, containing 2790 inhabitants.—Also, a township of the said county, with 840 inhabitants.

ATHEROPOGON, in *Botany*, from *αθηρ*, *an awn*, and *πωγων*, *a beard*, alluding to the appearance of the flowers.—Muhlenb. in Willd. Sp. Pl. v. 4. 937. Gram. 287. Pursh 75.—Clafs and order, *Triandria Dignia*. (*Polygamia Monoclea*, Willd.) Nat. Ord. *Gramina*.

Gen. Ch. *Cal.* Glume of two valves, two-flowered; floret neuter. *Cor.* Glume of two valves; in the perfect floret the outer valve has three awns, and the latter is cloven; in the neutral one the outer valve is membranous, cloven, awned below the point, the inner has two awns. *Stam.* in one floret

only, filaments three; anthers scarlet. *Pist.* in the fertile flower only, germen oblong; styles two; stigmas feathery. *Seed* solitary, oblong.

Efl. Ch. Calyx of two valves, two-flowered; one floret neuter. Corolla of two valves, the outermost with three awns: in the neutral floret both valves are awned.

1. *A. apludoides*. Reflexed *Atheropogon*. Willd. n. 1. Pursh n. 1.—Gathered by the late Rev. Dr. Muhlenberg, on gravelly hills, in Pennsylvania, flowering in September. Root perennial. Stem twelve or eighteen inches high, round, smooth, jointed in the lower part. Leaves lanceolate, very long; hairy at the base; their *sheaths* downy, crowned with a *slipula*. Cluster simple, erect, of about twenty alternate, distant, pendulous flowers, each on a short partial stalk. Anthers of a vermilion hue. Willdenow attributes but one valve to the calyx, Muhlenberg two. Their descriptions are meagre. There is no reason for referring this genus to *Polygamia*, even according to the most ample ideas of that clafs, for the presence of a neutral floret does not constitute its character, nor is perhaps any genus of grasses in the *Triandria Dignia* quite exempt from such.

ATHEROSPERMA, so named by the celebrated voyager M. Labillardiere, from *αθηρ*, *an awn*, and *σπερμα*, *seed*.—Labill. Nov. Holl. v. 2. 74.—Clafs and order, *Monoclea Monadelphica*. Nat. Ord. *Atherospermea*, Brown Bot. of Terra Australis, 21.

Gen. Ch. Male, *Cal.* Perianth of one leaf, bell-shaped, with eight obtuse marginal segments; the four alternate ones external and largest; the inner ones coloured. *Cor.* none. *Stam.* Filaments numerous, erect, inserted into the base of the calyx, and much shorter than its limb, somewhat combined at the bottom, and accompanied by scales; anthers elliptical, attached by the back, erect, of two cells, each opening by a longitudinal valve from the base upwards.

Female, *Cal.* as in the male, with the addition of numerous, internal, acute, marginal scales. *Cor.* none. *Pist.* Germens numerous, ovate, hairy; styles solitary, thread-shaped, hairy; stigmas simple. *Peric.* none, except the permanent, enlarged, hardened calyx. *Seeds* as many as the germens, small, oval, each crowned with its permanent feathery style.

1. *A. moschata*. Nutmeg *Atherosperma*. Labill. as above, t. 224.—Native of Cape Van Diemen, from whence we have specimens from the author; with others from A. B. Lambert, esq., gathered by general Grose. A tree, twenty-five feet or more in height; the young branches square, finely downy. Leaves opposite, on short thick stalks, without *stipulas*, elliptic-oblong, acute, either quite entire, or with a few sharp scattered teeth; smooth and besprinkled with minute pellucid dots above; finely downy and hoary beneath, with a reddish mid-rib and slightly visible veins. Flowers axillary, solitary, stalked, drooping, rather small. *Bractes* two, (*Involucrum* of Labillardiere,) close to each flower, ovate, acute, concave, downy, deciduous. *Calyx* finely hairy; that of the fruit much enlarged, half an inch broad, hemispherical, clothed with dense silky hairs, and filled like a bafon with feathery-tailed seeds, whose down resembles that of a syngeneisous plant, and is not represented in the above figure. The dried leaf, like every other part, as far as we can examine, has a very strong flavour of nutmegs, to which, and not to any mucky scent, the specific name alludes. We have chiefly followed our author in the above description, except a most important character, of the valvular anthers, borrowed from Mr. Brown, whose remarks in the following article will be found greatly to illustrate the present, and to render some future alterations necessary.

ATHERO.

ATHEROSPERMÆ, a new natural order, thus denominated from its leading genus. See the last article. *Brown Bot. of Terra Austr. 21.*

Flowers either separated or united. *Calyx* of one leaf; its margin divided into a generally double row of segments, the innermost, sometimes all of them, half petal-like (or internally coloured). There are also in the female, as well as in the united, flowers, small, internal scales, at the base of these segments. *Corolla* none. *Stamens* in the male flowers numerous, inserted into the bottom of the calyx, with accessory scales; in the united flowers they are fewer, and inserted into the throat; *anthers* attached by the back, of two cells, each cell opening by a longitudinal valve, separating from the base upwards. *Germens* one or more, generally an indefinite number, with a single, erect germ; *styles* solitary, occasionally lateral, or from the base; *stigmas* simple. *Seeds*, (termed seed-like pericarps by Mr. Brown,) awned with the feathery styles, and enclosed in the enlarged tube of the calyx; *embryo* erect, short, in the bottom part of a soft fleshy albumen. The several species are *trees*, with simple, opposite leaves, destitute of stipulas. *Stalks* axillary, single-flowered.

Jussieu it seems, *Ann. du Mus. v. 14. 116*, has established an order termed *Monimieæ*, in which *Atherosperma* is included, along with *Pavonia* of Ruiz and Pavon, its near ally, and the *Ambora*, (see MITHRIDATÆ,) *Monimia*, and *Ruiza*, which three last Mr. Brown considers as constituting the genuine order of *Monimieæ*, and therefore he has proposed the above, of which a most eminent distinction is their having the valvular *anthers* of the LAURÆ. (See that article.) This separation is confirmed by two New Holland plants evidently of the same family, but which have united *flowers*, a structure not probable in *Monimieæ*. The place of *Atherospermeæ*, in a natural series, is difficult to fix. Though so widely different, in most parts of their structure, from *Lauri*, (now called *Laurinæ*), they agree in *anthers*, and very remarkably with some of them in sensible qualities. *Pavonia* above-mentioned cannot, by Mr. Brown's account, be separated from *Atherosperma*, differing merely in the oblong form, and regular bursting, of its female calyx! Its qualities are the same.

ATKINSON, l. 3, r. in the year 1810, 556 inhabitants.

ATMOSPHERE, *Weight, &c. of the*. Col. 4, l. 3 from the bottom, for half an inch $r. \frac{2}{3}$ th or .02 of an inch.

ATMOSPHERIC AIR, *Chemical Composition of*. See AIR.

ATOMIC THEORY, in *Chemistry*. This important theory, which has added new lustre to chemistry by raising it to the rank of a mathematical science, was entirely unknown when the earlier volumes of the *Cyclopædia* were published. The history of its origin and progress has been amply detailed in subsequent parts of the work, particularly under the articles PROPORTIONS, DEFINITE, SIMPLE BODIES, and THEORY, ATOMIC; so that we have little left to add here, except a brief summary of some recent modifications suggested by Dr. Prout, and subsequently adopted by Dr. Thomson. See an anonymous Essay on the relation between the Specific Gravities of Bodies in their gaseous State, and the Weights of their Atoms, vols. vi. and vii. of Thomson's *Annals of Philosophy*.

The object of Dr. Prout in the above essay is to shew, 1st, that the theory of volumes suggested by Gay Lussac, and adopted by Berzelius and some others, is absolutely identical with Dalton's Theory of Atoms; and 2dly, that the specific gravities of bodies in their gaseous

state are all multiples of the same unit; which unit is considered as *hydrogen*.

Dr. Prout's essay is terminated very abruptly, and is evidently imperfect. The above views are not explicitly stated in the paper alluded to, though it is obvious they are what the author had in view; and as they have been recently adopted by Dr. Thomson, in the new edition of his *System of Chemistry*, which may be viewed in the light of a national work, we consider it our duty to lay a brief account of them before our readers.

The first of the above points attempted to be established by Dr. Prout has been already discussed at some length in the articles PROPORTIONS, DEFINITE, and THEORY, ATOMIC. Indeed, we believe it is very generally admitted by all those chemists who have taken the pains to examine and think upon the subject. It is chiefly founded upon facts and reasonings, which few at present affect to doubt, and of which the following is a summary. 1. Bodies unite together in certain definite proportions by weight, that is, certain weights of some bodies always combine with certain weights of other bodies. This constitutes the basis of the atomic theory, or the theory of definite proportions, as some have chosen to term it. 2. Substances in a gaseous state have been demonstrated to combine with reference to their bulk or volume, that is to say, one volume of one gas always combines with one or more similar volumes of another, and not with any odd fractional parts. Moreover, the volume or bulk of the resulting compound, if it happens to be a gas, always bears a similar relation to the original volumes of its component gases. For these important laws we are indebted to Gay Lussac, and they constitute the basis of what has been denominated the theory of volumes. 3. It is universally admitted, that the same weights of the same resulting compounds are formed when bodies unite in a gaseous state according to their volumes, as when they unite in any other manner according to their weight; thus, for example, one volume (100 cubic inches) of muriatic acid gas will unite with one volume (100 cubic inches) of ammoniacal gas, and form the same weight of the same compound, (muriate of ammonia,) as if 39.183 grains (the absolute weight of 100 cubic inches) of muriatic acid, united with 18.003 grs. (the absolute weight of 100 cubic inches) of ammonia; the two numbers 39.183 and 18.003 being to one another as 1.278 : .5900, or as 37 : 17, the specific gravities and the weights of the atoms of these two substances respectively. Such is a brief statement of the facts; and it is argued that if the above data are correct, it follows irresistibly from them that the weights of the atoms of bodies, are to one another as the specific gravities of the same bodies in a state of gas; and consequently that the theory of volumes and the theory of atoms is one and the same thing, different sets of numbers only being employed. Some apparent deviations from this law, which however cannot be by any means considered as exceptions, will be noticed hereafter.

With regard to the second point contended for by Dr. Prout; namely, that the specific gravities of all bodies in their gaseous state, or, in other words, the weight of their atoms are multiples of the same unit or hydrogen; it is partly founded upon experiment and reason, and partly (at present at least) upon hypothesis. The following is a summary of the grounds upon which the opinion has been formed.

1. The specific gravity of ammoniacal gas, according to sir Humphry Davy, is .590164, common air being 1.000; according to Biot and Arrago, it is a fraction greater: hence

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hence Dr. Prout has fixed upon .5902 as the specific gravity of this gas. The sp. gr. of azote he assumes as .9722, common air being 1.000, for reasons stated below. Now, as ammonia is known to be composed of one volume azote, and three volumes hydrogen, condensed into two volumes, the specific gravity of hydrogen, according to these data, must be .0694.

2. Atmospheric air is admitted to be universally composed of about 21 *per cent.* of oxygen, and 79 *per cent.* of azote, which so nearly corresponds with one volume of azote, and four volumes of oxygen, or 20 oxygen and 80 azote, that Dr. Prout has concluded that the above is its true composition, and consequently that it is a real chemical compound. (See AIR, *Atmospheric.*) Now the weight of the atom of oxygen being supposed to be 10, and that of the atom of azote 17.5, (Dr. Wollaston makes it 17.54,) the specific gravity of oxygen gas, according to these data, will be 1.1111, and of azote .9722. But these numbers are multiples of .0694 for $1.1111 \div .0694 = 16$, and $.9722 \div .0694 = 14$.

Such are two of the leading circumstances stated in the above essay, which appear to have induced our author to examine further into the subject. For this purpose, he seems to have selected a certain number of substances, and to have instituted a series of experiments on them, with the view of ascertaining the truth of the opinions which he had been led to adopt. These experiments are said to have been numerous; but their results are stated in a very summary way, and in a manner certainly not very likely to carry conviction. The whole is afterwards arranged in tables, and there contrasted with the acknowledged results of other experimentalists, with the view of shewing how nearly they coincide with each other. These tables will be found at the end of the present article, in an extended form, and comprehending all the new determinations of Dr. Thomson. The near approach to whole numbers of the weights of the atoms of all these substances, which have been most carefully examined, and are best known, is certainly very singular, and must strike every one who has paid attention to the subject. At the same time, no argument can be advanced against the opinion that certain relations exist among the combining weights or atoms of bodies; on the contrary, this opinion seems much more probable than that they have no connection and are entirely independent of one another.

With respect to the question, whether the above opinion

will ever be verified by actual experiment? it is difficult to determine. The differences in general assumed by Dr. Prout are so small, that in the present state of chemical analysis they may be fairly said to be within the limits of possible error; until, therefore, some more refined methods of experimental research be discovered, we can scarcely hope the matter will be decided in this manner.

We mentioned above, that there are a few substances whose specific gravity does not correspond with the weight of their atom; thus the specific gravity of oxygen, for example, is sixteen times that of hydrogen, while its combining weight is only half or eight times that of hydrogen. This at present cannot be explained; but it is remarkable, that the specific gravities are always some multiple of the weight of the atom. (See further on this subject under THEORY, *Atomic.*) In the following tables will be found other examples of the curious circumstance under consideration.

We shall make no further observations at present, but adopt Dr. Prout's plan of throwing together in tables the great mass of evidence on the subject, and leaving the question to be decided by the impartial judgment of our readers.

In the first and second columns of the following tables are given the specific gravities and weights of the atoms of the different substances, supposing them to be in a gaseous state, hydrogen being 1; "and if," says Dr. Prout, "we suppose the volume to be 47.2135 cubic inches, the numbers will at the same time represent the number of grains this quantity of each gas will actually weigh." We may remark here, that if these views should ever be established, they afford an excellent rational standard for weights, as compared with measures. Thus the cube of the pendulum, for example, vibrating seconds, might be the unit in volume of hydrogen, whose actual weight might be the unit in weight. Such a relation between weights and measures would be as general and immutable as the laws of nature themselves, and be worthy of the enlightened age in which we live. In the third column are the corrected numbers, the atom of oxygen being supposed, according to Dr. Wollaston, Dr. Thomson, &c., 10 or 1: and in the fourth, the same as obtained by experiment are stated to shew how nearly they coincide. The other columns will be sufficiently understood from inspection. The last column in the first table contains the numbers recently assigned by Mr. Brande to the elementary substances.

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TABLE I.—Elementary Substances.

Name.	Specific Gravity, Hydrogen being 1.	Weight of Atom, Hydrogen being 1.	Weight of Atom, Oxygen being 16.	Weight of Atom, Oxygen being 16 from Experiment.	Specific Gravity, Common Air being 1.000	Specific Gravity, Common Air being 1.000 from Expt.	Weight of 100 Cubic Inches, Barom. 30, Ther. 60	Weight of 100 Cubic Inches, Barom. 30, Ther. 60 from F. specimen.	Numbers lately of found by Mr. Bland, Hydrogen being 1
* Hydrogen - - -	1	1	1.25	1.32	.06944	.073	2.118	2.230	1
* Carbon - - -	6	6	7.5	7.54	.4166	—	12.708	—	5.7
? Boron - - -	6	6	7.5	6.6	.4166	—	12.708	—	5.5
? Silicon - - -	8	8	10.0	10.2	.5555	—	16.944	—	15
? Aluminium - -	10	10	11.25	—	.6944	—	21.180	—	15
? Magnesium - -	12	12	15.0	15.6	.8333	—	25.416	—	11
? Phosphorus - -	12	12	15.0	15.6	.8333	—	25.416	—	10
* Azote - - -	14	14	17.5	17.54	.9722	.969	29.652	29.560	13
* Oxygen - - -	16	8	10.0	10.0	1.1111	1.104	33.888	33.672	7.5
* Sulphur - - -	16	16	20.0	20.0	1.1111	—	33.888	—	15
? Glucinum - - -	18	18	22.5	—	1.2500	—	38.124	—	—
* Calcium - - -	20	20	25.0	25.46	1.3888	—	42.360	—	19
* Sodium - - -	24	24	30.0	29.1	1.6666	—	50.832	—	22
? Nickel - - -	27	27	33.75	—	1.8740	—	57.186	—	55.5
* Iron - - -	28	28	35.0	34.5	1.9440	—	59.302	—	—
? Chrome - - -	28	28	35.0	35.0	1.9440	—	59.302	—	52
* Manganese - -	28	28	35.0	—	1.9440	—	59.302	—	56.5
? Cobalt - - -	29	29	36.25	—	2.0130	—	61.420	—	—
* Zinc - - -	32	32	40.0	41.0	2.2222	—	67.777	—	33
? Yttrium - - -	32	32	40.0	—	2.2222	—	67.777	—	—
* Chlorine - - -	36	36	45.0	44.1	2.5006	2.483	76.248	—	33.5
? Zirconium - -	37	37	46.25	—	2.5694	—	78.366	—	45
? Arsenic - - -	38	38	47.5	47.86	2.6388	—	80.484	—	—
* Potassium - -	40	40	50.0	49.1	2.7777	—	84.720	—	37.5
* Strontium - - -	44	44	55.0	55.07	3.0555	—	93.192	—	44.5
? Antimony - - -	—	—	56.25	56.25	3.1250	—	95.310	—	85
* Cerium - - -	46	46	57.5	—	3.1944	—	97.428	—	—
? Iridium - - -	48	48	60.0	—	3.3333	—	101.664	—	—
? Molybdenum - -	48	48	60.	60.	3.3333	—	101.664	—	44
? Palladium - - -	56	56	70.0	—	3.8888	—	118.604	—	—
Tin - - -	59	59	73.75	73.5	4.0970	—	124.972	—	55
Copper - - -	64	64	80.0	80.0	4.4444	—	135.555	—	60
* Barium - - -	70	70	87.5	87.0	4.8611	—	148.260	—	65
* Bismuth - - -	71	71	88.75	89.94	4.9300	—	150.378	—	66.5
? Tungsten - - -	96	96	120.0	120.0	6.6666	—	203.333	—	—
Lead - - -	104	104	130.0	129.5	7.2222	—	220.272	—	97
Silver - - -	110	110	137.5	135.0	7.6380	—	232.980	—	102
? Rhodium - - -	120	120	150.0	149.03	8.3333	—	254.160	—	—
* Iodine - - -	120	120	150.0	156.21	8.3333	—	254.160	—	117
? Uranium - - -	125	125	156.25	—	8.6800	—	264.750	—	—
? Platinum - - -	181	181	226.25	—	12.5680	—	383.350	—	92
? Gold - - -	198	198	248.75	249.68	13.7490	—	419.364	—	97
Mercury - - -	200	200	250.0	250.0	13.8888	—	423.600	—	190

Those substances marked thus * were contained in Dr. Prout's table. Those marked thus ? will probably hereafter be found different ; or at least we are not certain if the numbers attached to them are accurate.

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TABLE II.—Combinations with Oxygen.

Name.	Specific Gravity, Hydrogen being 1.	Weight of Atom, Hydrogen being 1.	Weight of Atom, Oxygen being 16.	Weight of Atom, Oxygen being 16, from Experiment.	Specific Gravity, Common Air being 1.000.	Specific Gravity, Common Air being 1.000 from Expt.	Weight of 100 Cubic Inches, Barom. 30. Tier. 60.	Weight of 100 Cubic Inches, Barom. 30. Tier. 60. from Experiment.	Elements by Volume.	No. of Vol. after Combination.	Elements by Weight.
Water - - -	9	9	11.25	11.32	.625	.6896	16.062	21.033	.5 ox. + 1 hyd.	1	1 ox. + 1 hyd.
Carbonic oxyd - -	14	14	17.5	17.54	.9722	.956	29.652	29.16	.5 ox. + 1 car.	1	1 ox. + 1 car.
Nitrous oxyd - -	22	22	27.5	—	1.5277	1.614	46.596	49.227	.5 ox. + 1 az.	1	1 ox. + 1 az.
Common air - - -	14.4	36	45	—	1.000	1.000	30.5	30.5	.5 ox. + 2 az.	2.5	1 ox. + 2 az.
Euchlorine - - -	44	44	55	—	3.0555	2.409	93.192	73.474	.5 ox. + 1 chl.	1.5	1 ox. + 1 chl.
Lime, &c. - - -	28	28	35	35.46	1.9444	—	59.304	—	.5 ox. + 1 cal.	—	1 ox. + 1 cal.
Carbonic acid - -	22	22	27.5	27.54	1.5277	1.510	46.596	46.313	1 ox. + 1 car.	1	2 ox. + 1 car.
Nitrous gas - - -	15	30	37.5	—	1.0416	1.0388	31.77	31.684	1 ox. + 1 az.	2	2 ox. + 1 az.
Sulphureous acid, &c.	32	32	40	—	2.2222	2.1930	67.77	66.89	1 ox. + 1 ful.	1	2 ox. + 1 ful.
Nitrous acid - -	38	38	47.5	—	2.6388	—	80.484	74.0234	1.5 ox. + 1 az.	1	3 oz. + 1 az.
Sulphuric acid, &c.	40	40	50	50	2.7777	2.427	84.72	—	1.5 ox. + 1 ful.	1.5	3 oz. + 1 ful.
Nitric acid - - -	54	54	67.5	67.54	3.75	—	114.372	—	2.5 ox. + 1 az.	1.5	5 ox. + 1 az.
Chloric acid - - -	76	76	95	—	5.277	—	160.968	—	2.5 ox. + 1 chl.	1.5	5 ox. + 1 chl.
Iodic acid, &c. - -	160	160	200	—	11.111	—	338.888	—	2.5 ox. + 1 iod.	1.5	5 ox. + 1 iod.

The subdivisions of the above Table include the different states of oxydation of the different substances. A few only of the numbers of those best known are introduced, as azote, &c., with the view, in the first place, of saving room; but more particularly because they are little or altogether unknown, or, if known, may be easily obtained from the data given in Table I.

TABLE III.—Other Compounds, chiefly of Hydrogen.

Name.	Specific Gravity, Hydrogen being 1.	Weight of Atom, Hydrogen being 1.	Weight of Atom, Oxygen being 16.	Weight of Atom, Oxygen being 16, from Experiment.	Specific Gravity, Common Air being 1.000.	Specific Gravity, Common Air being 1.000, from Expt.	Weight of 100 Cubic Inches, Barom. 30. Tier. 60.	Weight of 100 Cubic Inches, Barom. 30. Tier. 60. from Experiment.	Elements by Volume.	No. of Vol. after Combination.	Elements by Weight.
Carburetted hy- drogen - - -	8	4	5	5.09	.5555	.5555	16.999	16.999	2 hyd. + 1 car.	1	2 hyd. + 1 car.
Olefiant gas - -	14	7	8.75	8.86	.9722	.9740	29.652	29.72	1 hyd. + 1 car.	.5	1 hyd. + 1 car.
Sulphuretted hy- drogen - - -	17	17	21.25	21.32	1.1805	1.177	36.006	35.89	1 hyd. + 1 ful.	1	1 hyd. + 1 ful.
Muriatic acid - -	18.5	37	46.25	45.42	1.284	1.278	39.183	38.979	1 hyd. + 1 chl.	2	1 hyd. + 1 chl.
Hydriodic acid -	62.5	125	156.25	157.53	4.3402	4.3463	132.375	—	1 hyd. + 1 iod.	2	1 hyd. + 1 iod.
Ammonia - - -	8.5	17	21.25	21.5	.5902	.5900	18.003	18.000	3 hyd. + 1 az.	2	3 hyd. + 1 az.
Phosphuretted hy- drogen - - -	13	13	16.25	16.25	.9027	—	27.534	—	1 hyd. + 1 phof.	1	1 hyd. + 1 phof.
Cyanogen - - -	26	26	32.5	32.52	1.8055	1.8064	55.068	—	2 car. + 1 az.	1	2 car. + 1 az.
Hydro-cyanic acid-	13.5	27	33.75	33.846	.9374	.9360	28.593	—	1 cya. + 1 hyd.	2	1 cya. + 1 hyd.
Chloro-cyanic acid-	31	62	77.5	—	2.1527	2.1111	65.659	—	1 cya. + 1 chl.	2	1 cya. + 1 chl.

ATRAGENE, in *Botany*, (see our former article,) a name adopted from Theophrastus, whose ἀτραγενή, according to De Candolle, is probably our *Clematis Vitalba*. This genus is much reduced by the learned writer just named, who refers *A. japonica* and *alpina* to *Clematis*, *A. capensis* and *tenuifolia* to *ANEMONE*. (See that article.) The only remaining species is *A. seylanica*, which De Candolle retains as a genus by itself, under the new name of *Naravelia*, taken from *Naracoval* of Herm. Zeyl. 26, one of its synonymy. But this being a Linnaean *Atragene*, and the only one which remains, that name must, by every principle and right, remain with it, especially as it is distinguished from *Clematis* by the original generic character of *Atragene*. A figure of this plant is given in Roxb. Coromand. v. 2. 47. t. 188.

ATRIPLICES, the twenty-ninth natural order in Jussieu's system, the sixth of his sixth class, whose characters are given under LAURI. Mr. Brown, Prodr. Nov. Holl. v. 1. 405, adopts, from De Candolle, the appellation of *Chenopodeæ* for this order, for which we have discovered no reason, *Atriplex* being as well-known a genus, and as expressive a type of the order, as *Chenopodium*. The characters are as follows.

Calyx of one leaf, often deeply divided. *Stamens* definite, inserted into the bottom of the calyx. *Germen* solitary, superior; style either single, or wanting, or for the most part manifold, of a determinate number; stigmas one, rarely two, to each style. *Seeds* solitary, (numerous in *Phytolacca*, two in *Galenia*.) either naked, or covered by the calyx, which thus becomes, in a manner, superior; or inclosed in a pulpy, or a capsular, pericarp. *Coraculum* surrounding a farinaceous mass. *Stem* in numerous instances herbaceous, in some shrubby. *Leaves* mostly alternate, sometimes opposite. *Stamens* occasionally in separate flowers from the pistils.

Sect. 1. *Fruit* pulpy.

Phytolacca, *Rivina*, *Salvadora*, and *Bofsea*; the last supposed to be more akin to the *Rhamnii*.

Sect. 2. *Fruit* capsular.

Petiveria; *Polycnemum*; *Camphorosma*; and *Galenia*: not without some doubts respecting the two last.

Sect. 3. *Seed* covered by the calyx. *Stamens* free.

Bajella; *Anredera*, Juss. which is *Fegopyrum scandens*, &c., Sloane Jam. v. 1. 138. t. 90. f. 1; *Anabasis*; *Caroxylum*, Thunb.; *Salsola*; *Spinacia*; *Anida*; *Beta*; *Chenopodium*; and *Atriplex*.

Sect. 4. *Seed* covered by the calyx. *Stamens* fewer than five.

Crucita; *Axyris*; *Blitum*; *Ceratocarpus*; and *Salicornia*.

Sect. 5. *Seed* not covered by the calyx.

Corispermum only.

This order is analogous to the *Holeraceæ* of Linnæus, though many extraneous things are referred to the latter.

Mr. Brown asserts that the *Atriplices*, or *Chenopodeæ* are not distinguishable by any character from the *AMARANTHI*, (see that article,) though different in habit, and differing from the *Illecebree*, (by which is meant Jussieu's third section of *Amaranthi*;) in the want of stipulas. The insertion of the stamens into the calyx, according to this accurate observer, is not absolutely constant, nor are the *Amaranthi* all free from that insertion. Yet on this mark the distinction is founded, not merely between these two neighbouring orders, but between the sixth and seventh classes of Jussieu, which thus run into each other. We do not mean, by pointing out these intricacies of Nature, which render it so difficult for us to submit her to human regulations, to throw needless difficulties in the way of those, who attempt this arduous task by other means than we ourselves pursue. We merely remind them of our common fallibility, and recom-

mend patient investigation, with mutual assistance, in the place of dogmatical assumption and invidious criticism.

ATTELABUS, col. 2, l. 1, for are r. is; l. 23, *dele* which see respectively, and add—One of the principal species is *A. Coryli*, a smallish insect found in hazel-trees, black, with red wing-veins, usually measuring about a quarter of an inch in length. A much smaller species is the *A. Betule*, altogether black, and remarkable for gnawing the leaves of that tree in the early part of spring; so that they appear notched on the edges. The *A. Apiarius* is an elegant species, deriving its name from the injury which its larva does in bee-hives by destroying the young. See *APIARIUS*.

ATTER of Roses. See *Essence of ROSES*.

ATTLEBOROUGH. Add—It contains 2716 inhabitants.

ATTRACTION of Mountains, col. 2, l. 50, r. 43644; l. 51, for 43" r. 42" 94.

AVA, l. 1, r. *Aungwa*.

AUBENAS, l. 3, for Coiron r. Privas.

AVERILL, in *Geography*, a township of America, in Vermont and county of Essex, having nine inhabitants.

AUGUST, a gold coin of Saxony, of which are double, single, and half august d'ors, reckoned at 10, 5, and 2½ rix dollars: 35 single augusts weigh a Cologne mark of gold 21 carats 8 grains fine.

AUGUSTA, in *Geography*, a town of the district of Maine, in the county of Kennebeck, containing 1805 inhabitants.

AUGUSTA, a county of Virginia, l. 4, r. 14,308, and 2880 slaves.

AULAX, in *Botany, from αὐλάξ, a furrow, alluding to the chink in each petal containing one of the stamens.—Berg. Cap. 33. Brown Tr. of Linn. Soc. v. 10. 49. Ait. Hort. Kew. v. 5. 373.—Class and order, *Dioecia Tetrandria*. Nat. Ord. *Proteaceæ*, Juss. Brown.*

Ess. Ch. Male. Flowers distinct. Calyx none. Petals four, bearing the stamens. Pistil imperfect.

Female. Flowers aggregate. Calyx none. Petals four, bearing imperfect stamens. Stigma oblique. Nut exposed, tumid, bearded.

1. *A. pinifolia*. Pine-leaved Aulax. Berg. n. 1. Br. n. 1. Ait. n. 1.

Male. *Protea pinifolia*; Linn. Mant. 187. Willd. Sp. Pl. v. 1. 515. Andr. Repof. t. 76.

Female. *P. bracteata*; Thunb. Diff. n. 24. t. 1. Linn. Suppl. 118. Willd. Sp. Pl. v. 1. 517.

Leaves thread-shaped, channelled.—Native of hills near the Cape of Good Hope. *A shrub* one or two feet high, with round, red, leafy branches. *Leaves* numerous, scattered, simple, undivided, smooth, slender, spreading every way, two or three inches long. *Flowers* yellow; the male in several long clusters, forming a terminal leafy umbel; female in a dense solitary head.

2. *A. umbellata*. Umbellate Aulax. Br. n. 2. Ait. n. 2. Male. *Protea aulacea*; Thunb. Diff. n. 33. t. 2. Willd. Sp. Pl. v. 1. 520.

Female. *P. umbellata*; Thunb. Diff. n. 34. Linn. Suppl. 118. Willd. Sp. Pl. v. 1. 520. Andr. Repof. t. 248.

Leaves linear-implicate, flat.—Native of hills at the Cape of Good Hope. *A shrub* two or three feet high, with bright-green, blunth, smooth leaves. *Flowers* yellowish, terminal; the male in shortish blunt clusters; female in a solitary whitish head, encompassed with long, narrow, yellow, radiating bractææ.

Both these are green-house plants in England, flowering in the latter part of summer. The second is said to be the most hardy.

AVOLA, l. 4, for minor *r. major*.

AVON, in *Geography*, a township of America, in the district of Maine and county of Somerset, having 304 inhabitants.

AURA, in *Ornithology*, l. 5, *r. Ulloa*.

AURANTIA, in *Botany*, a well-marked natural order, comprehending the Orange tribe and its allies, as the name expresses. Jussieu is the author of this order, the seventieth in his arrangement, or the tenth of his thirteenth class; nor are there any traces of it among the *fragments* of Linnæus. For the characters of this important thirteenth class, we refer the reader to GERANIA, and proceed to define the order in question.

Calyx of one leaf, often deeply divided. *Petals* definite, broad at the base, inserted around a disk on which the germens are placed. *Stamens* placed upon the same disk, definite, or more rarely indefinite, their filaments either distinct, or combined in one or more parcels. *Germen* one; style one; stigma simple, or rarely divided. *Fruit* mostly pulpy, sometimes capsular, of one or many cells, with one or two seeds in each. *Corculum* straight, ascending, destitute of albumen. *Stem* arborescent or shrubby. *Leaves* alternate, simple, or in some few instances, compound.

SECT. 1. *Fruit with only one seed.* The leaves of this section are not marked with resinous dots, and hence the plants are termed spurious *Aurantia*. Except *Ximenia*, their affinity to this order is by no means apparent, in any degree, to us.

Ximenia; *Heisteria*; and *Fissilia* a genus of Commerçon's, whose identity with *Olex* we have already indicated in its proper place. See FISSILIA.

SECT. 2. *Fruit many-jointed, pulpy.* These are genuine *Aurantia*, having the leaves full of pellucid resinous dots.

Chalcas, which is not only, as Jussieu suspected, the same genus, but the very same species with *Murraya*; *Bergera*; *Murraya*; *Cookia* of Sonnerat; *Citrus*; and *Limonia*.

SECT. 3. *Fruit many-jointed, capsular.* Leaves not dotted. Genera akin to *Aurantia* and to *Melic*.

Ternstromia, of Mutis, with *Tonabea* of Jussieu, which is the very same genus, are here prefixed to *Thea* and *Camellia*; but surely they have little relationship to the true *Aurantia*, either in their habit or fructification. They form an order by themselves, and there is so much connection between their stamens and the corolla, as might remove this order to Jussieu's ninth class, where it would very naturally follow his *Guaiacane*, if not absolutely reducible to that very family, at least to its second section.

That Linnæus had formed no conception of any order analogous to the genuine *Aurantia*, is evident, from his having referred *Citrus* to a section of the *Bicornes*, and having left *Limonia* undetermined, though so naturally and evidently akin to *Citrus*. He had even introduced *Garcinia*, with a mark of doubt indeed, into the same section of *Bicornes*; but expunged it in manuscript, giving its opposite leaves as a reason. By that character, and indeed every other, *Garcinia* answers to Jussieu's *Guttiferæ*, a natural order which, however striking and important, likewise escaped the sagacity of Linnæus.

AURELIUS, in *Geography*, l. 1, for military *r. post*; l. 2, for Onondago *r. Cayuga*; l. 5, for 1796 *r. 1810*, and for 123 *r. 323*. Add—The number of inhabitants, who are principally employed in agriculture, is 4642, and this capital of Cayuga county ranks the third in population and wealth of the county, and has three post-offices.

AURORA, a township of Ohio, in the county of Portage, containing 189 inhabitants.

AUSTIN, a township of Ohio, in the country of Trumbull, containing 440 inhabitants.

AUTOGRAPHUM. See WRITING-MACHINE.

AUTOMALITE. See RUBY and MINERALOGY, *Addenda*.

AXIA, in *Botany*, from $\alpha\lambda\iota\sigma$, *valuable*, alluding to its medical virtues and high estimation.—Loureir. Cochinch. 35. Vahl Enum. v. 2. 38.—Class and order, *Triandria Monogynia*. Nat. Ord. *Nyctagineæ*, Juss.

Gen. Ch. *Cal.* Perianth superior, of three short, acute, unequal, deciduous leaves. *Cor.* of one petal, bell-shaped, very small, its border in ten flat, short, rounded, equal segments. *Stam.* Filaments three, capillary, the length of the corolla; anthers of two globular lobes. *Pist.* Germen inferior, ovate, furrowed; style thread-shaped, the length of the stamens; stigma thickish. *Peric.* none. *Seed* solitary, ovate, furrowed, hairy.

Eff. Ch. *Calyx* three-cleft, superior, deciduous. Corolla of one petal, with ten segments. *Seed* solitary.

r. cochinchinensis. *Nhon sam phu yen* of the Cochinchinese.—Native of Cochinchina, nor did Loureiro ever meet with this plant elsewhere. It is almost as much esteemed as *Gin-jeng*, as a warm strengthening medicine, promoting expectoration and the various secretions, useful in intermittent fevers, indigestions, &c. The stem is shrubby, procumbent, with many knotty branches, extending about two feet. *Root* tapering. *Leaves* opposite, unequal, small, ovate-lanceolate, slightly crenate, downy. *Flowers* small, variegated with red and white, in nearly terminal clusters.

AYA-PANA, a South American plant of the genus EUPATORIUM, (see that article,) of which an account is given in the Bulletin des Sciences, n. 67. 147, as peculiarly efficacious against the poison of serpents, on which account it is much cultivated in the island of Mauritius, and in Cayenne. The bruised leaves are said to cure the sting of a scorpion, and that of a poisonous fish, named *last*. An infusion of the herb has proved useful in dropsy, as well as in syphilitic disorders. This plant has been cultivated in the stoves at Paris, but we have heard nothing of it in England.

AYMOUTH. See EYMOUTH, *dele*.

AZOLLA, in *Botany*, an unexplained name.—Lamarck Dict. v. 1. 343. Illustr. t. 863. Willd. Sp. Pl. v. 5. 541. Pursh 672. Juss. 17, under *Salvinia*. Brown Prodr. Nov. Holl. v. 1. 166. Bot. of Terra Austr. 79.—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices*, Linn. Juss. Rhizospermeæ; Roth. De Cand. *Marsileaæ*, Brown.

Gen. Ch. Male, in pairs, enclosed in a single-leaved, membranous, clove *involverum*, (occasionally solitary under the female,) ovate, of two cells, their outer covering bursting transversely; upper cell containing nine or six angular bodies, inserted around a tubular axis, which finally opens at the summit; lower cell spherical, closed by a double membrane, and filled with a fluid, which may perhaps change to a powder.

Female, axillary, on the same plant, solitary (sometimes accompanied underneath by a solitary male). *Involverum* double, both closed, membranous; the outer like that of the male flowers; inner ovate, without valves, containing numerous capsules, without valves, attached by capillary stalks to a common receptacle, originating from the base of the involucre. *Seeds* from six to nine, angular, with exterior radicles.

Eff. Ch. Male, ovate, of two cells, separating transversely; the upper containing several angular, stalked bodies.

Female on the same plant, capsules numerous, stalked, globose,

globose, of one cell and one valve, in an ovate, close involucre. Seeds several, angular.

1. *A. filiculoides*. South-American Azolla. Lamarck n. 1. t. 863. (*A. magellanica*; Willd. n. 1. *Mufcus squamulosus aquaticus elegantissimus*; Feuille. Voy. v. 3. 43. t. 35. Dill. Musc. 335. t. 43. f. 72.)—Fronnd pinnate. Leaflets all papillary. Roots smooth.—Found by Feuillée in Peru; by Mr. Menzies in Chili; in watery places; and at the straits of Magellan by Commerçon. This is a little floating mossy plant, resembling a *Jungermannia*, an inch or two long, alternately pinnate, with small, imbricated, ovate, fleshy leaves, clothed externally with papillary hairs, and membranous at the edges. The roots are long, slender, smooth and naked, dark brown. No fructification has been discovered in this species.

2. *A. pinnata*. Triangular Pinnate Azolla. Br. n. 1. Bot. of Terra Austr. 79. t. 10.—Fronnd pinnate, triangular. Upper leaflets papillary. Roots longitudinally feathery.—Gathered by Mr. Brown, in lakes and ponds, at Port Jackson, New South Wales. A little floating plant like the foregoing. Roots axillary, solitary, perpendicular, unbranched, pellicid, hooded at the point when young, at first light quite simple, but under a magnifier they appear feathery about the middle part. Fronnd half an inch long. Branches two-ranked, alternate, crowded. Leaves alternate, imbricated every way; those on the upper side of each branch ovate, somewhat angular, cellular, thick, often reddish, rough on the upper surface with papillary tubercles; those on the under side thinner, smooth, and less angular. Flowers on the under side of the frond, sessile, solitary at the base of each branch.

Mr. Brown seems to think the true pollen of this curious genus originates in the watery or turbid fluid, which he once found changed to powder, and which may be discharged through the tube above, whose angular appendages, once suspected to be anthers, (see his *Prodr.*) may by pressure facilitate its ejection, whether in a watery or powdery state.

3. *A. rubra*. Red Orbicular Azolla. Br. n. 2.—Fronnd orbicular; lobes palmate; their subdivisions undivided or cloven. Upper leaves smooth. Roots feathery beyond the middle.—Gathered by Mr. Brown, at Port Jackson, as well as in Van Diemen's island. The fructification has essentially the same structure of that of *A. pinnata*, except the angular bodies of the upper cell being only six, not nine.

Brown.

4. *A. caroliniana*. Carolina Azolla. Willd. n. 2. Pursh n. 1.—“Leaves imbricated, ovate-oblong, obtuse, spreading; red underneath.”—Found by Richard, in Carolina; by Pursh floating on the waters of lake Ontario. We know nothing more of this species; and as those who have described it were unacquainted with the fructification, as well as with Mr. Brown's specific definitions, the above character requires revision.

AZORELLA, Lamarck Dict. v. 1. 344. Illustr. t. 189. Juss. 226. 453. See CHAMITIS, as well as BOLAX hereafter.

AZOTE, in *Chemistry*. The specific gravity of azote, according to the most recent determinations, is .9722, and 100 cubic inches of it will weigh, at a mean temperature and pressure, 29.652 grains. Biot and Arrago make its

specific gravity .9691, and Lavoisier .978. See ATOMIC Theory.

A new compound of chlorine and azote was discovered a few years ago, which, from its remarkable properties, deserves to be described here.

This compound seems to have been first noticed by M. Dulong in 1812; but this chemist, on account of two severe accidents which happened to him in the course of his experiments, did not complete the investigation of its properties, nor publish any thing on the subject. Sir H. Davy was informed of the discovery of the substance soon after, but not of the method of preparing it. Chancing, however, to hear from Mr. Children, that Mr. Burton of Cambridge had procured an oily substance by passing a current of chlorine through a solution of nitrate of ammonia, he was enabled to prepare the compound in question, and investigate its properties.

Chloride of azote may be prepared by placing a jar of chlorine gas over a solution of nitrate or muriate of ammonia, heated to about 110°. The gas is slowly absorbed, and an oily-like matter collects at the bottom of the vessel, which is the substance in question. Care must be taken not to collect at one time more than a globule or two, as it explodes with prodigious violence from the slightest cause. Its colour closely resembles that of olive-oil. It is transparent; its smell is strong and peculiar, though it is not so disagreeable nor injurious to the lungs as chlorine. It is very volatile, and soon disappears when left in the open air. At 160° it may be distilled over without danger, but is partially decomposed. The temperature of 200° only occasions it to evaporate faster, but when heated to 212° it explodes with amazing force. In a vacuum it is converted into vapour, but again assumes the liquid form when the pressure of the air is restored. This vapour, if heated sufficiently, explodes with as much violence as the liquid itself. The sp. gr. of the chloride of azote is 1.653. It does not become solid on exposure to cold. When left in water it speedily disappears, and azotic gas escapes. In strong muriatic acid, chlorine escapes, and muriate of ammonia remains in solution. When brought in contact with phosphorus, oils, and many other substances, it explodes with very great violence. Metals, resins, sugar, and most of the gases, do not cause it to explode. The experiments of Sir H. Davy on the composition of this curious substance render it probable, in Dr. Thomson's opinion, that it is composed of one volume or atom of azote, and four volumes or atoms of chlorine.

Azote has likewise the property of forming an analogous compound with iodine. (See IODINE, and SIMPLE BODIES.) The celebrated chemist Berzelius still, we believe, maintains the opinion, that azote is a compound of oxygen and an unknown substance, which he denominates *nitricum*; and a laborious set of experiments was some time ago published by Mr. Miers, to shew that this unknown substance is nothing but hydrogen. Chemists in general, however, do not at present acquiesce in either of these opinions, but consider azote as an elementary substance.

For the combinations of azote with oxygen, see ATOMIC Theory, NITRIC Acid, &c. and PROPORTIONS, *Definite*.

AZUMBRE, a liquid measure in Spain. See ARROBA, *Addenda*.

B.

B A B

BABIANA, in *Botany*, an unexplained name. Can it allude to the Syrian Venus, *Babia*? Or does it acknowledge the baser etymology of *Papio*, a Baboon, because those animals perhaps eat the roots? (See the 8th species.)—Ker in Sims and Kon. Ann. of Bot. v. 1. 233. Dryandr. in Ait. Hort. Kew. v. 1. 104.—Clas and order, *Triandria Monogynia*. Nat. Ord. *Enfate*, Linn. *Irides*, Juss.

Gen. Ch. *Cal.* Spatha inferior, large, of two valves; the inner valve deeply cloven, with an intermediate pellucid membrane. *Cor.* of one petal, superior; tube funnel-shaped, longer than the spatha; limb shorter than the tube, in six deep, usually regular and nearly equal segments, sometimes very irregular. *Stam.* Filaments three, thread-shaped, inserted into the mouth of the tube, erect, much shorter than the limb; anthers oblong, incumbent. *Pist.* Germen roundish; style thread-shaped, rather longer than the tube; stigmas three, spreading, obtuse, undivided. *Peric.* Capsule roundish-ovate, coriaceous, unequally tumid, of three cells and three valves. *Seeds* numerous, globose, pulpy; tapering at the base, at length corrugated, and deformed by mutual pressure.

Eff. Ch. Spatha of two valves; the innermost deeply divided. Corolla tubular; limb in six deep segments. Stigmas three, spreading. Seeds pulpy.

1. *B. Thunbergii*. Many-piked Babiana. Ker n. 2. Ait. n. 1. (*Antholyza plicata*; Thunb. Prodr. 7. Fl. Cap. v. 1. 169. Linn. Suppl. 96. Willd. Sp. Pl. v. 1. 223.)—Leaves many-ribbed, finely downy as well as the stalks and sheaths. Corolla ringent.—Native of sandy plains near the sea, below *Verlooren Valley*, at the Cape of Good Hope, flowering in October. *Thunberg*. Mr. Masson sent this species, in 1774, to Kew, where it flowers in April. *Bulb* deep in the ground. *Leaves* radical, equitant, acute, with some principal, yellow, and many intermediate green ribs; minutely downy on both sides, with soft prominent hairs. *Stalk* radical, taller than the leaves, a foot high, zigzag, densely clothed with fine soft hairs, and divided into about half a dozen alternate, spiked, many-flowered branches. *Flowers* crimson, two inches long, crowded, erect.

2. *B. ringens*. Gaping Babiana. Ker n. 1. Ait. n. 2. (*Antholyza ringens*; Linn. Sp. Pl. 54. Willd. Sp. Pl. v. 1. 223. Thunb. Prodr. 7. Fl. Cap. v. 1. 167. *Gladiolus zethiopicus similis*; Comm. Hort. v. 1. 81. t. 41. Rudd. Elyf. v. 2. 237.)—Leaves many-ribbed, smooth. *Stalk* downy. Corolla ringent.—Found in low sandy fields, often by the way side, in many places about the Cape of Good Hope, flowering from July to September. Not at present in the gardens, as far as we could ever learn;

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or at least we never heard of its flowering. Not so tall as the preceding, nor so much branched, but the *flowers* are larger and more handsome, remarkably widely ringent, with one *stamen* far removed from the other two.

3. *B. nervosa*. Four-ribbed Babiana. (*Antholyza nervosa*; Thunb. Prodr. 7. Fl. Cap. v. 1. 164.)—Leaves smooth, with four strong, prominent ribs. *Stalk* smooth. *Spike* oblong, two-ranked. *Corolla* ringent.—Native of the Cape of Good Hope. *Leaves* three or four, acute, smooth, with four yellowish, elevated ribs, erect, about a foot high. *Stalk* as tall as the leaves. *Flowers* flesh-coloured, drooping, crowded into an ovate, rather abrupt, spike; their lower lip rather the shortest, reflexed. There can surely be no doubt respecting the genus of this plant.

4. *B. tubiflora*. Long-tubed Babiana. Ker n. 3. Ait. n. 3. Ker in Curt. Mag. t. 847. (*Gladiolus tubiflorus*; Linn. Suppl. 96. Willd. Sp. Pl. v. 1. 219. Thunb. Diff. n. 23. t. 2. f. 2. Fl. Cap. v. 1. 210. Jacq. Ic. Rar. t. 266. *G. inclinatus*; Redoubt. Liliac. t. 44.)

β. Ker in Curt. Mag. t. 680. (*G. tubatus*; Jacq. Ic. Rar. t. 264. Willd. Sp. Pl. v. 1. 219. Redout. Liliac. t. 261. *G. longiflorus*; Andr. Repof. t. 5.)

γ. Keribid. (*G. tubati varietas*; Jacq. Ic. Rar. t. 265.) *Leaves* ribbed, plaited, downy, taller than the downy stalk. *Tube* of the corolla slender-clubshaped, thrice as long as the irregular nearly equal limb, whose upper segment is divaricated.—Native of Svartland, at the Cape of Good Hope, flowering from August to October. The *leaves* vary greatly in length, but are more or less elliptic-oblong, and taller than the oblique *stalk*, whose height is from one to ten inches. *Spike* solitary, simple. *Sheaths* lanceolate, downy. *Corolla* white, with a crimson spot on each of the three lower segments; its tube sometimes reddish, varying in thickness, but always about three inches long.

5. *B. spathacea*. Stiff-leaved Babiana. Ker n. 4. Ait. n. 4. Ker in Curt. Mag. t. 638. (*Gladiolus spathaceus*; Thunb. Diff. n. 25. Fl. Cap. v. 1. 208. Linn. Suppl. 96. Willd. Sp. Pl. v. 1. 221.)—Leaves plaited, rigid, pungent, somewhat downy. *Tube* of the corolla thread-shaped, twice as long as the regular limb. *Sheaths* tumid, pointed, smooth.—Found in dry situations above the Cape of Good Hope, in Bockland, and Hantum, flowering in October and afterwards. *Thunberg*. *Leaves* linear-lanceolate; those of old plants often naked; their base tapering into long *foolstalks*, dilated downward. *Stalk* varying in height, from four inches to near three feet. *Spike* many-flowered. *Spathas* much inflated, with beaked points. *Tube* very slender.

slender. *Limb* pale bluish purple, with elliptic-oblong, nearly equal segments, an inch long; three alternate ones bluntish, with a point; three lowermost marked with white and violet.

6. *B. sambucina*. Elder-scented Babiana. Ker n. 12. Ait. n. 5. Ker in Curt. Mag. t. 1019. (*Gladiolus sambucinus*; Jacq. Hort. Schoenbr. v. 1. 7. t. 15. Vahl Enum. v. 2. 117.)—Leaves scarcely downy. Stalk smooth. Tube hardly longer than the downy, pointed spathe; throat cylindrical; segments of the limb nearly equal and uniform, keeled.—Imported from the Cape, by George Hibbert, esq. in 1799. About a span high, with large, violet-coloured, very sweet-scented flowers, each of whose segments, above an inch long, has a darker violet keel, or mid-rib.

7. *B. sulphurea*. Pale Babiana. Ker n. 5. Ait. n. 6. Ker in Curt. Mag. t. 1053. (*Gladiolus sulphureus*; Jacq. Ic. Rar. t. 239. Vahl Enum. v. 2. 99. *G. plicatus*; Andr. Repof. t. 268.)—Leaves downy, shorter than the ascending downy stalk. Tube shorter than the spathe, and but one-third as long as the nearly uniform limb.—Native of the Cape, from whence it was procured by Messrs. Lee and Kennedy, in 1795. The leaves are elliptic-oblong, strongly plaited, downy all over. Flowers large, with a short tube; limb cream-coloured, with some tints of blue.

8. *B. plicata*. Sweet-scented Babiana. Ker n. 13. Ait. n. 7. Ker in Curt. Mag. t. 576. (*Gladiolus plicatus*; Thunb. Diff. n. 24. Fl. Cap. v. 1. 211, with many wrong synonyms. *G. fragrans*; Jacq. Hort. Schoenbr. v. 1. 7. t. 14.)—Leaves elliptic-lanceolate, loosely plaited, very soft and downy. Segments of the limb nearly equal, the length of the tube; upper one hooded.—One of the most common species at the Cape, near the town, and in various other places, flowering from May to October. Thunberg says the Europeans call this plant *Babianer*. Has this, whatever it means, given occasion to Mr. Ker's generic name? Nearly akin to the last, but of a softer texture. Flowers fragrant, pale lilac, or bluish-white, marked with violet at the base of their three lower segments. Stamens ascending.

9. *B. striata*. Upright Babiana. Ker n. 6. Ait. n. 8. Ker in Curt. Mag. t. 621. 637. (*Gladiolus striatus*; Ait. ed. 1. v. 1. 63. *G. plicatus*; Linn. Sp. Pl. 53. *Ixia*; Mill. Ic. 103. t. 155. f. 1.)—Leaves elliptic-lanceolate, plaited, downy. Corolla funnel-shaped, nearly regular; segments about as long as the tube, all flat.—Native of the Cape; long known in our green-houses, though not very frequent. The flowers are smaller than most of the foregoing, with obovate, pointed, equal segments, either all blue, or pale grey, or alternately white and purplish, each hardly an inch long. Spathe small, linear-lanceolate, downy.

10. *B. villosa*. Dark-red Babiana. Ker n. 8. Ait. n. 9. Ker in Curt. Mag. t. 583. (*Ixia villosa*; Ait. ed. 1. v. 1. 58. *I. pumicea*; Jacq. Ic. Rar. t. 287. Willd. Sp. Pl. v. 1. 198. *Gladioli plicati* var. *purpurea*; Thunb. Diff. n. 24. Fl. Cap. v. 1. 213.)—Leaves downy. Tube throat-shaped, the length of the regular, bell-shaped limb, whose three alternate segments are obtuse with a point.—Native of the Cape. The leaves are rather broad, elliptic-lanceolate, strongly plaited. Stalk oblique and wavy, rather taller than the leaves. Flowers the size of the last, of a deep blood-red, without scent; their tube suddenly united to the limb, without any dilatation at the throat. Anthers dark violet, remarkably large and thick.

11. *B. rubro-cyanea*. Red and blue Babiana. Ker n. 7. Ait. n. 10. (*Ixia rubro-cyanea*; Jacq. Ic. Rar. t. 285. Willd. Sp. Pl. v. 1. 198. Curt. Mag. t. 410. *I. villosa*; Schneev. Ic. t. 16. *Gladiolus rubro-cyaneus*; Vahl Enum. v. 2. 98.)—Leaves elliptic-lanceolate, stalked, downy. Tube throat-shaped, the length of the regular, wide-spreading limb, whose segments are uniform, rhomboid-obovate.—Native of the Cape. Sent to Kew by Mr. Maffon in 1794. Very nearly akin to the last, particularly in the shape of the tube; but the limb is more spreading, with uniform blue segments, red at their base, making a very showy appearance. It is not easy to discover by what rule Vahl reduced this plant to *Gladiolus*, except by the herbage.

12. *B. obtusifolia*. Blunt-leaved Babiana. Ker n. 9. (*Ixia villosa*; Jacq. Ic. Rar. t. 284. Willd. Sp. Pl. v. 1. 198.)—Leaves elliptic, bluntish, downy. Tube throat-shaped, nearly the length of the funnel-shaped regular limb, whose segments are elliptical; throat somewhat dilated.—Native of the Cape. We know this species merely from Jacquin's figure, where it is represented of humble growth, all over downy, with an oblique stalk, and a few large flowers of a uniform bluish-white; their sheaths elliptic-lanceolate, somewhat tumid. Stigmas slender. Anthers small, blue.

13. *B. disticha*. Hyacinth-scented Babiana. Ker n. 10. Curt. Mag. t. 626. (*Gladiolus plicatus*; Jacq. Ic. Rar. t. 237.)—Leaves elliptic-oblong, strongly plaited, finely fringed. Throat of the corolla funnel-shaped; segments of the limb linear-lanceolate, nearly equal, partly crisped at the margin.—Native of the Cape. It flowered at Mr. Colville's nursery in June 1802. The leaves are broad. Flowers bluish-white, with dark-blue marks and anthers, their scent like an oriental hyacinth, but finer. Mr. Dryander seems to have overlooked this species; unless, as we suppose, he included it under *plicata*, n. 8.

14. *B. mucronata*. Brittle-pointed Babiana. Ker n. 11. (*Gladiolus mucronatus*; Jacq. Ic. Rar. t. 253. Coll. v. 4. 162. Willd. Sp. Pl. v. 1. 221. Vahl Enum. v. 2. 115. *G. ringens*; Thunb. Prodr. 186. Fl. Cap. v. 1. 214, excluding Jacquin's *sulphureus*.)—Leaves elliptic-oblong, stalked, plaited, downy. Stalk branched. Throat of the corolla funnel-shaped, elongated; segments of the limb linear-obovate, three alternate ones awned; three lower reflexed.—Native of the Cape of Good Hope. The leaves, in Jacquin's figure, have stalks nearly of their own length. The sheaths, like the whole herbage, are downy; and as long as the tube of the corolla. Throat rather short, funnel-shaped as well as the limb, whose segments are very deep; linear and elongated at the base, pale yellow in that part, lilac towards the extremity; the central one of the upper lip largest; the two next awned, like the central one of the lower lip.

BACILLUM, (a little stick or staff,) was once used by Acharius for the stalks elevating the tubercles of the Cup Lichens. (See LICHEN; sect. 7.) This term occurs in his Prodromus, but is supplanted in his more recent publications by *Podetium*. Both terms appear to us superfluous, *Pedicellus* having precisely the same meaning.

BADKU, in Geography. See BAKU.

BÆOMYCES, in Botany, from *βαιος*, small, and *μυκη*, a fungus, is well appropriated to this genus of Lichens, their fructification looking exactly like some minute kinds of *Agaricus* or *Helvella*.—Perfoon in Uff. Annal. safc. 7. 19. Achar. Lichenogr. 168. t. 12. f. 1, 2. Syn. 279.—Class and order, *Cryptogamia Alge*. Nat. Ord. Lichenes.

Eff. Ch. Tubercles solitary, on solid simple stalks, from an uninterrupted granulated crust.

In the *Methodus* of Acharius, this genus is so characterized as to include all the *Lichenes pyxidati*, as well as the *Cledonia*, of other authors. At present it is restricted to the first section of the original *Baomyces*, consisting of four species only. The characters and synonyms of these are correctly given by our learned friend, except that of *Lichen ericetorum* of Linnaeus, which we remove from this genus, on the authority of original specimens.

1. *B. roseus*. Rose-coloured Mushroom-Lichen. Perf. as above. Ach. n. 1. (Lichen *Baomyces*; Linn. Suppl. 450. Ehrh. Phyt. n. 89. Sibth. Ox. 321. Engl. Bot. t. 374. Hoffm. Enum. 37. t. 8. f. 3. L. ericetorum; Web. Gott. 195. Lightf. 809. a. Fl. Dan. t. 1003. f. 2. Coralloides fungiforme carneum, basi leprosa; Dill. Musc. 76. t. 14. f. 1.)—Cruet glaucous-grey. Stalks very short, cylindrical. Tubercles tumid, lobed, rose-coloured.—Found on mountainous heaths, in broad uninterrupted patches on the ground, of a greenish or glaucous grey when fresh and moist, conforming to all the inequalities of the soil; the surface finely granulated. *Tubercles* from one to two or three lines in diameter, of a bright and most elegant rose colour, convex, more or less lobed, or irregularly tumid, each supported by a thick, round, solid stalk, about as high as the diameter of the head, white tinged with a blush of red. This is by far the most elegant, as well as the most rare, of our British species. Dr. Acharius here cites Engl. Bot. t. 372, which is his *Leidea Icmadophila*, Syn. 45, the true *Lichen ericetorum* of Linn. Sp. Pl. 1608. Fl. Suec. 408. and Herb. Linn. Fl. Dan. t. 472. f. 4. Lichen Icmadophila; Linn. Suppl. 450. Ehrh. Phyt. n. 40. L. zeruginosus; Jacq. Aultr. t. 275.

2. *B. fungoides*. Pale Mushroom-Lichen. Ach. n. 2. ("B. helveloides; Bory Voy. 3.") Lichen fungoides; Swartz Ind. Occ. 1886.)—Cruet white. Stalks thrice as tall as the diameter of the pale flesh-coloured tubercles.—Gathered by Dr. Swartz on the gravelly soil of high mountains, in the southern part of Jamaica. Bory de St. Vincent found the same in the isle of Bourbon. We have specimens from Dr. Acharius. The *cruet* is thin, hard, of a dirty white. *Stalks* white, thrice as tall as the foregoing; tumid at the base. *Heads* of a lighter flesh-colour, with a white powdery efflorescence.

3. *B. rufus*. Brownish Mushroom-Lichen. "Wahlenb. Lapp. 449." Ach. n. 3. (Lichen rufus; Hudf. 527. L. fungiformis; Web. Goett. 196. Sibth. Ox. 322. Hoffm. Enum. 38. t. 8. f. 2. L. byssoides; Linn. Mant. 133. Lightf. 809. Engl. Bot. t. 373. L. pelitifer; Wulf. in Jacq. Coll. v. 3. 104. t. 3. f. 1. Coralloides fungiforme faxatile, pallide fuscum; Dill. Musc. 78. t. 14. f. 4.)
β. *B. lignorum*. Achar. (*B. rupestris* γ; Ach. Meth. 322.)

Cruet greenish-white. Stalks short, somewhat compressed. Tubercles nearly globular, reddish-brown; sometimes aggregate.—Common on heathy ground, or on rocks, rarely on rotten wood; in which last situation the *tubercles* assume a darker brown. They are much smaller than in *B. roseus*, rounder and less lobed, though often clustered together; their colour is a dirty brick-red.

The variety β of Engl. Bot. figured in Raii Syn. t. 1. f. 3, not f. 4; and in Dill. Musc. t. 14. f. 5, is now esteemed a fungus. See OXYGENA.

4. *B. placophyllus*. Broad-leaved Mushroom-Lichen. "Wahlenb. Lapp. 449." Ach. n. 4. Meth. 323. t. 7. f. 4.—Cruet orbicular, rugged, somewhat lobed and imbricated, glaucous-white. Stalks elevated, compressed. Tubercles convex, simple, reddish-brown.—Found by Wahlenberg, on the sterile sandy soil of Lower Lapland. We are

obliged to Dr. Acharius for a specimen of this very curious species, whose *cruet* approaches that of the true Cup Lichens, its circumference at least being lobed and almost leafy, though of a thick substance. The tubercles are altogether those of a *Baomyces*.

BAGDAD, col. 4, l. 1, after terraces. Bagdad is still a place of great trade, and the resort of merchants from almost every quarter of the East. It supplies all Asia Minor, Syria, and part of Europe, with Indian commodities, which are imported at Bassora, brought in boats up the Tigris, and then transported by caravans to Tocat, Constantinople, Aleppo, Damascus, and the western parts of Persia. The chief imports from India are, gold brocade, cloths, sugar, pepper, tin, sandal-wood, iron, china-ware, spice, cutlery, arms, and broad-cloth; in return for which they send bullion, copper, gall-nuts, tamarisk, leather, and otto of roses. From Aleppo are imported European silk-stuffs, broad-cloths, steel, cochineal, gold thread, and several other European articles, which are brought in Greek vessels to Scanderoon. The imports from Persia are, shawls, carpets, silk, cotton, white cloth, leather, and saffron; and those from Constantinople are, bullion, furs, gold and silver thread, jewels, brocade, velvets, and otto of roses. The principal manufacture at this place is that of red and yellow leather, which is much esteemed; but silk and cotton stuffs are likewise made. The climate, notwithstanding its excessive heat, is allowed to be very healthy. But the natives are subject to a cutaneous disorder, for which no cure has yet been discovered: it appears in the form of a pimple, then degenerates into an ulcer, and at the end of eight or ten months dries up of itself, leaving a prominent mark. The inhabitants of Aleppo, and other towns in Syria, are subject to this disease. The military government of Bagdad is, &c.

BAGDAD, *Pachalic* of, extends in a N.W. direction from the mouth of the Shat-ul-Arab to the rocks of Merdin, and in an E. and W. line from the confines of Persia to the banks of the Khabor, which separates it from the pachalic of Orfa. It comprehends the whole of the ancient Babylonia, and the greatest part of Assyria Proper; that is, the space which is embraced by the Tigris and the Euphrates, and that which is beyond the TIGRIS, commonly called the lower Kurdistan. See BABYLONIA and ASSYRIA.

BAHAR. Add.—The bahar of Acheen, in Sumatra, consists of 100 catees, and is equal to 490 lbs. avoirdupois. The bahar of Betlefacee, in Arabia, consisting of 40 farcels, is = 815½ lbs. avoirdupois. The bahar of Bencoolen = 560 lbs. avoirdupois. The bahar of Junkfeylon of 8 capins = 485 lbs. 5 oz. 5½ dr. The bahar of Malacca, of 3 peculs = 405 lbs. avoirdupois. The bahar of Mocha, of 15 franks = 445 lbs. avoirdupois.

BAHREIN, N. lat. 26° 43'.
BAJOCO. Add.—Rome exchanges with Amsterdam 42 bajocchi, more or less, for 1 florin banco; with Leghorn, 95 bajocchi, more or less, for 1 pezza of 8 reali. Rome keeps accounts in scudi. See SCUDO.

BAIRDSTOWN, l. 3, r. 821, 202 being slaves.
BAIT, WHITE. Add.—See CLUPEÆ *Aloja*.
BAKERSFIELD. Add.—It contains 812 inhabitants.
BAKU. Infert, or BAKOU. N. lat. 42° 22'. Add.—Baku is defended by a double wall and deep ditch, constructed during the reign of Peter the Great. This was once a celebrated city of the ancient worshippers of fire, and before the conquest of the Saracens was annually visited by thousands of pilgrims.

BALDIVIA, l. 7, r. W. long. 74°.
BALDWIN, in *Geography*, a town of America, in the district of Maine, and county of Cumberland, containing 546 inhabitants.

inhabitants.—Alfo, a county of Georgia, which, together with its town Milledgeville, contains 6356 inhabitants; the flaves in the county being 2324, and in the town 226.—Alfo, a county in the territory of Miffiffippi, having 1427 inhabitants, including 717 flaves.

BALFOURIA, in *Botany*, received its name from the pen of Mr. Brown, in honour of his illuftrious countryman fir Andrew Balfour, knight, founder of the Botanic Garden, as well as of the Public Mufeum, at Edinburgh. His friend, fir Robert Sibbald, has embalmed his memory in the *Memo-ria Balfouriana*; nor could any one be more competent to this fubject. Thefe diftinguifhed men firft laid the foundation of the ftudy of natural hiftory in Scotland.—Brown Tr. of the Wern. Soc. v. 1. 70. Prodr. Nov. Holl. v. 1. 467.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Cortioria*, Linn. *Apocineæ*, Juff. Br.

Eff. Ch. Corolla funnel-shaped; throat crowned with a fmall renate tube; fegments of the limb ftraight, equilateral. Stamens inferted into the throat; anthers arrow-shaped, pointed, cohering with the ftigma about the middle. Germen of two cells; ftyle folitary, thread-shaped, dilated at the top; ftigma angular. Scales ten at the bafe of the calyx, on the outfide of the corolla; none under the germen. *Follicles*.....

1. *B. faligna*. Willow-leaved Balfouria. Br. n. 1.—Discovered by Mr. Brown, in the tropical part of New Holland. A tree, about twelve feet high, fmoth. *Leaves* oppofite, linear-lanceolate, falcate, with little teeth between the infertion of their *footftalks*. *Cymes* lateral as well as terminal, three-cleft.

BALK. Infert—or **BULKH**. Col. 1, 1. 3, after Bactriana, infert—It was formerly included in Khoraffan, and is bounded on the N.E. by the Oxus, E. by Koondooz, W. by Khoraffan, and S.W. by the mountains of Huzara, and the independent ftate of Mymuna. Col. 2, l. 17, after Perfians, add—The Tanjets, or the race of people who inhabit this country, befides the Afghans and Uibecks, are corrupt and diffolute, and addicted to the moft unnatural vices. The Uibecks are fimple, honeft, and humane. Col. 2, l. 60, after Hindoftan, add—It is faid to be as large as Delhi; but moft of the houfes are uninhabited; and the population is faid to be reduced to between 6 and 7000 men, fubject to the king of Cabul. The vicinity of the town is well cultivated, and corn and provifions are abundant.

BALLABUAN, *r.* **BALLAMBUAN**, and remove to next column.

BALLISTIC PENDULUM, a pendulum ufed in afcertaining the velocity, &c. of balls, the ftrength of gunpowder, &c. &c. See **GUNNERY**, **GUNPOWDER**, and **PENDULUM**.

BALLOGISTAN, l. 10, *r.* Mekran. At the clofe, add—Ballogiftan, or, as it is otherwife called, Balouchiftan, the country of the Balouches, is confidered by fome as a province diftinct from Mekran or Meeran; and as fuch properly commences at Koohinee (the hilly road) 25 miles N.E. of Bayla, or in N. lat. 26° 35', from which place it extends to Noolhky, 79 miles N.W. of Kelat, or in N. lat. 30°. It is faid to be a confufed mafs of tremendous mountains, through which the road generally leads in water-courfes. Flocks of fheep and herds of cattle are numerous in every part of this country, and it alfo produces great quantities of wheat. The territories of Mahomed Khan, chief of Balouchiftan, comprehend all the countries lying between 20° 30' and 30° N. lat., and from 65° to 69° E. long. It is divided into the two mountainous provinces of Ihalawan and Sarawan, the low country of Cutch Gandava to the E., and the provinces of Zuhree and Amund Dajul; to which

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may be added the fmall diftricts of Shat and Muftung, lying N. of Kelat. See **SARAWAN** and **MECRAN**.

BALLOTADE, l. 5, *r.* thefe airs, &c.; l. 8, *r.* horfeman.

BALLS, **CHAIN**. For *chain-balls* *r.* *chain-bullets*.

BALLS, *Stang, dele.*

BALOUCHISTAN. See **BALLOGISTAN**.

BALSAMITA, in *Botany*, an old name, ufed by Dodonæus and others, alluding to the balsamic odour of the flowers and herbage, and their reputed ftimulating healing qualities. It is revived by Profeflor Desfontaines, who, after the example of Vaillant, has recently feparated the feveral fpecies of this genus from *Cotula*, *Chryfanthemum*, and *Tanacetum*, into which they had been forced, though deftitute of radiant, or female, florets, as well as of a crown to their feeds.—Desfont. Act. Soc. Hift. Nat. Parif. v. 1. 1. Willd. Sp. Pl. v. 3. 1800. Ait. Hort. Kew. v. 5. 519.—Clafs and order, *Syngenefia Polygamia-æqualis*. Nat. Ord. *Compositæ difcoideæ*, Linn. *Corymbiferaæ*, Juff.

Gen. Ch. *Common Calyx* flatifh, imbricated; fcales numerous, linear, convex, acute, the inner ones with a membranous margin. *Cor.* compound, uniform, tubular, longer than the calyx. Florets all perfect, numerous, funnel-shaped, equal; their limb in five regular, acute, fpreading fegments. *Stam.* in each floret, Filaments five, capillary; anthers united into a five-toothed tube, hardly longer than the tube of the corolla. *Pift.* Germen roundifh; ftyle thread-shaped, longer than the corolla; ftigmas two, revolute. *Peric.* none, except the permanent calyx. *Seeds* folitary to each floret, fmall, oblong, ftriated, fometimes bordered with a narrow longitudinal membrane at one fide, but abrupt at the fæmmit, without any crown or wing. *Recept.* flightly convex, naked. Eff. Ch. Receptacle naked. Seed-down none. Calyx imbricated.

1. *B. grandiflora*. Large-flowered Coftmary. Desf. Act. Soc. Hift. Nat. Par. v. 1. 1. t. 1. Willd. n. 1. (*Cotula grandis*; Linn. Sp. Pl. 1257.)—Stem herbaceous, hairy, fimple and fingle-flowered. Leaves ferrated; radical ones obovate; thofe of the ftem lanceolate; dilated and deeply toothed at their bafe.—Found by Desfontaines in corn-fields at Algiers, flowering in May. Linneus had it from thence. A handsome biennial plant, conspicuous for its large, yellow, cushion-like flower, about two inches broad, compofed of innumerable crowded florets. The *ftem* is two or three feet high, unbranched, leafy, and hairy. *Leaves* numerous, fmoth; the radical ones ftalked, two or three inches long.

2. *B. virgata*. Wand-branched Coftmary. Desf. as above, 2. Willd. n. 2. Ait. n. 1. (*Cotula grandis*; Jacq. Obf. fasc. 4. 4. t. 81. *Chryfanthemum difcoideum*; Allion. Pedem. v. 1. 190. t. 11. f. 1.)—Stem herbaceous, fmoth; branched at the bafe; branches fingle-flowered. Leaves linear-lanceolate, ferrated, nearly feffile; upper ones linear, entire.—Native of Italy. This is the plant mentioned under his *Cotula grandis* by Linneus; as having been fent by Allion. It is however, as he fufpected, very diftinct from that plant; being much fmaller in every part; the *ftem* fmoth and branched; *leaves* none of them fpatulate, nor dilated and deeply cut at the bafe. *Flowers* fimilar, but fcarcely half fo large, efpecially thofe of the lateral branches.

3. *B. ageratifolia*. Sharp-toothed Coftmary. Desf. as above, 2. Willd. n. 3. Ait. n. 2. (*Chryfanthemum ftofulofum*; Linn. Sp. Pl. 1255. *Bellis fpinofa*; Alpin. Exot. 327. t. 326. *B. major fpinofa*, petalis carens; Morif. lect. 6. t. 9. f. 16.)—Stem fhrubby, branched at the bafe. Leaves obovate, fharply ferrated, crowded. Flowers corymbofe.—Native of Crete; an old green-houfe plant in

3 A

England,

England, but not popular at present. The *branches* are rather loosely spreading, smooth, covered with smooth *leaves*, an inch and a half long, whose numerous teeth are sharp, and even spinous. Several deep-yellow convex *flowers* compose a corymbose cluiter at the extremity of the item or branch.

4. *B. vulgaris*. Common Colthary. Willd. n. 4. (B. major; Desf. as above, 3. Dod. Pempt. 295. B. mas; Ger. Em. 648. *Mentha græca*; Matth. Valg. v. 2. 75. Camer. Epit. 480. *Tanacetum Balfamita*; Linn. Sp. Pl. 1184.)—Stem herbaceous. Leaves ovate, serrated; the lower ones stalked; upper auricled. Flowers corymbose.—Native of Tuscany, France, and Switzerland. A hardy old kitchen-garden herb, flowering in August and September. *Root* perennial. *Stems* round, leafy, somewhat branched, two feet high. *Leaves* hoary. *Flowers* numerous, small, yellowish, accompanied with small leaves. The whole plant has a strong warm odour. Gerard speaks of it as sometimes infused in ale, for medicinal purposes, but we know not of its being in use at present, though often kept in rustic gardens.

BALTIMORE, l. 12, after contains, add—by the census of 1810, 29,255; and for 5877 r. 6697.

BALTIMORE, col. 1, l. 9 from the bottom, add—By the census of 1810, the number of inhabitants in the city of Baltimore was 35,583, including 3713 slaves; in the eastern precincts 4050, comprehending 262 slaves; and in the western precincts 6922, including 697 slaves.

BALTIMORE, a town of Vermont, in the county of Windfor, having 207 inhabitants.

BAMBERG, col. 1, l. 19, add—Before it was secularized in 1813, it contained a surface of 65 German miles, with a population of 192,000 souls, and a revenue of 556,000 dollars. Col. 1, l. 24, after populous, add—containing about 2030 houses, and 16,500 inhabitants.

BAMFF, col. 2, l. 31, insert—The burgh and parish contained, in 1811, 3603 persons; 1540 males, and 2063 females.

BAMFESHIRE, col. 2, l. 4, r. in 1811, was 36,668 persons; 16,465 males, and 20,203 females: 3815 families being employed in agriculture, and 2195 in trade, manufactures, and handicraft.

BAMPTON, l. 19, r. 1061 houses, and 5864 inhabitants; 2882 males, and 2982 females.

BANBURY, l. ult. r. and the borough and parish, by the returns of 1811, contained 582 houses, and 2841 persons; 1331 males, and 1510 females.

BAND, a weight used on the Gold Coast for weighing gold duit, and equal to two ounces troy.

BAND-*Fish*. See CEPOLA.

BANDER-*Abassi*, r. GAMBRON.

BANGOR, col. 2, l. 37, r. the city and parish, in 1811, contained 456 houses, and 2383 inhabitants, viz. 1094 males, and 1289 females.

BANGOR, in America, add—It contains 850 inhabitants.

BANK, MILLION. Add to dissolution—in 1796.

BANKSIA, in *Botany*, one of the most magnificent and peculiar genera among the native plants of New Holland, was with great propriety dedicated to the honour of the illustrious discoverer of this genus, by the younger Linnaeus. (See our former article BANKSIA, which requires correction, as embracing several species not now included herein, but already described in the present work under the articles CONCHIUM and XYLOMELUM.) On the other hand, a much greater number of genuine *Banksia*, first made known by Mr. Brown, since the publication of that original article; require to be added. We are at a loss to account for the report concerning the species with solitary flowers, at the

end of that article. It may have had some foundation which has escaped the memory of the writer of this. The only SALISBURIA ever published belongs to a totally different family, and may be found in its proper place. Thirty-one species of *Banksia* are defined by Mr. Brown, of which four only were known to Linnaeus, from specimens and engravings communicated by sir Joseph Banks.—Linn. Suppl. 15. Schreb. Gen. 79. Murr. in Linn. Syst. Veg. ed. 14. 161. Willd. Sp. Pl. v. 1. 535. Mart. Mill. Dict. v. 1. Ait. Hort. Kew. v. 1. 213. Brown Tr. of Linn. Soc. v. 10. 202. Prodr. Nov. Holl. v. 1. 391. Juff. 79. Lamarck Illustr. t. 54. f. 1, 2. Gærtn. t. 48.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Aggregatae*, Linn. *Proteaceae*, Juff. Brown.

Gen. Ch. *Cal.* Catkin cylindrical, dense, many-flowered; flowers in pairs, with three permanent scales to each pair, two of which are interior, and smallest. *Cor.* of one petal, in four deep linear segments, at length separating entirely, somewhat dilated and concave at the summits, their points long cohering, till forced asunder by the growing style. Nectary four scales at the base of the germen. *Stam.* Filaments four, very short, inserted into the base of the cavity of each petal; anthers oblong. *Pist.* Germen superior, of two single-seeded cells, very small; style cylindrical or angular, rigid, gradually curved, firmly held, for a long time, by the combined tips of the corolla; stigma undivided. *Peric.* Follicle woody, firmly fixed in the receptacle, obovate, of two shallow cells; the partition unconnected, rigid, elastic, cloven by a deep transverse fissure at the top. *Seeds* solitary, compressed, quite flat at the inner side, wedge-shaped, and extended into a rounded, membranous, terminal wing.

Eff. Ch. Corolla of one petal, four-cleft, bearing the stamens in the hollows of its segments. Nectary four scales at the base of the germen. Follicle woody, of two single-seeded cells, with a cloven moveable partition. Catkin with three scales to each pair of flowers.

Obs. The greater part of the very numerous flowers are necessarily abortive, or they would not be room for the follicles to ripen.

The various species, all natives of New Holland, are either shrubs, or trees of no lofty stature. The *branches* are umbellate; or in Linnæan language the *stem* is “determinately branched,” as in *Erica* and other *Bicornes*. *Leaves* scattered, rarely whorled, simple, undivided, either entire, serrated, toothed, or cut in a pinnatifid manner; in a young plant they are often variously cut, or toothed, though undivided and entire on the same when full grown. (*Brown*.) *Catkins* solitary, terminal, rarely lateral, cylindrical, in some cases very short. *Bractææ* several at the base of each catkin, short and narrow. *Catkin* when in fruit hard and heavy, its enlarged common receptacle firmly united with the bases of the *follicles*, the surface bristly with remains of the *flowers*, and especially with the unimpregnated *styles* of the greater part, intermixed with the large, hard, usually downy or hairy, *follicles*. *Seeds* black, with a brown, shining, oblique *wing*, the convex side of each filling a depression in the corresponding side of the thin wooden *partition*.

SECT. 1. *Style longer than the corolla, projecting laterally, in a curved position, between its segments, the stigma being held fast, for some time longer, between their points.* *Catkins*, when in flower, cylindrical; when in fruit, laden with numerous transverse *follicles*. These Mr. Brown considers as true *Banksia*. Indeed this section embraces the whole genus, except one species. We follow Mr. Brown’s names and numbers.

1. *B. pulchella*. Small-flowered *Banksia*. Ait. n. 1.—Leaves acroste, entire, pointless. Tube of the corolla woolly;

BANKSIA.

woolly; limb smooth. Stigma capitate; depressed.—Native of dry heaths, near the sea-shore in Lewin's land, on the southern coast of New Holland, where it was found by Mr. Brown, and sent to Kew in 1805, but had not yet flowered there in 1810. The leaves are not longer than the finger-nail.

2. *B. sphaerocarpa*. Round-fruited Banksia. Ait. n. 2.—Leaves acrofe, entire, pointed. Corolla hairy all over, externally. Stigma awl-shaped. Cones globose. Follicles tumid, rather compressed at the summit.—Found on low heaths in Lewin's land: Sent to Kew by Mr. Peter Good, in 1803. The leaves are an inch long.

3. *B. nutans*. Nodding-flowered Banksia. Ait. n. 3.—Leaves acrofe, entire, pointed. Catkins drooping. Corolla filky. Follicles dilated at the summit, depressed.—On dry heaths near the shore of Lewin's land, where, like the two former, it was gathered by Mr. Brown.

4. *B. ericifolia*. Heath-leaved Banksia. Linn. Suppl. 127. Willd. n. 7. Ait. n. 4. Banks Ic. Ined. apud Bibl. Linn. t. 4. Andr. Repof. t. 156. Curt. Mag. t. 738. Cavan. Ic. v. 6. 27. t. 538. (Banksia; White's Voy. 225. t. 22. f. 1.)—Leaves acrofe, emarginate, with two teeth; entire at the edges. Catkins elongated. Corolla filky. Stigma capitate.—Native of the eastern coast of New Holland, on rocky heaths near Port Jackson, from whence it was sent by Dr. White, among the first botanical communications from that country, and is now in several green-houses, flowering at various times of the year. This species was however first discovered by Sir Joseph Banks and Dr. Solander, in their celebrated voyage. The stem is three or four feet high. Leaves very numerous, the length of the nail, evergreen, smooth, revolute. Flowers bright yellow. Catkins five or six inches long. Follicles abrupt, rough with rusty, deciduous hairs.

5. *B. spinulosa*. Prickly-leaved Banksia. Sm. Bot. of New Holl. 13. t. 4. Willd. n. 6. Ait. n. 5. Andr. Repof. t. 457. Cavan. Ic. v. 6. 26. t. 537.—Leaves linear, revolute, with spinous teeth towards the end, and three terminal ones, the intermediate tooth longell. Corolla smooth internally at the base. Stigma awl-shaped.—Native of dry heaths about Port Jackson. Larger than the last. Leaves from one to three inches long; white beneath. Corolla yellow. Expofed part the styles purple.

6. *B. collina*. Hill Banksia. Br. n. 6.—Leaves linear, with spinous teeth; veiny beneath; their terminal tooth shortest. Scales of the catkin obtuse, downy at the extremity. Corolla smooth internally at the base. Stem shrubby.—Gathered by Mr. Brown on dry open hills about Hunter's river, New South Wales.

7. *B. occidentalis*. West-coast Banksia. Ait. n. 6.—Leaves linear, with spinous teeth beyond the middle; veinlets beneath. Scales of the catkin smooth at the extremity. Corolla withering; bearded internally at the base. Follicles tumid, downy; rather compressed and naked at the summit. Stem shrubby. Young branches smooth.—Found by Mr. Brown, in heathy ground, at Lewin's land.

8. *B. littoralis*. Sea-side Banksia. Ait. n. 7.—Leaves linear, elongated, with spinous teeth; veinlets beneath; tapering at the base. Corolla deciduous. Follicles compressed, downy at the summit, as well as the scales of the catkin. Stem arboreous. Young branches downy.—Found by Mr. Brown on the sandy shores of creeks in Lewin's land. The flowers were pale.

9. *B. marginata*. Various-leaved Banksia. Cavan. Ic. v. 6. 29. t. 544. Ait. n. 8.

B. microtachya; Cavan. Ic. v. 6. 28. t. 541, excluding the reference to *B. dentata* of Linnæus!

γ. Brown.

Leaves linear, abrupt, pointed, either entire or toothed, with scarce-visible veins beneath. Ultimate branches hairy. Scales of the catkin all smooth at the end; the larger ones acute. Stem shrubby.—Native of heaths, in the neighbourhood of Port Jackson, New South Wales. The stem is usually six feet high. Leaves generally entire, shorter than the catkin, scarcely exceeding two inches in length; their under side white and downy. Flowers orange-coloured. In variety β the leaves are bordered with spinous teeth, and less revolute, sometimes exceeding the length of the unusually small catkins. γ is a dwarf diffuse shrub, with flatfish, wedge-shaped, spinous-toothed leaves, longer than the catkins. Brown.

10. *B. depressa*. Prostrate Banksia. Br. n. 10.—Leaves long-wedge-shaped, abrupt, pointed, spinous-toothed; slightly ribbed and veined beneath; rather longer than the catkins, all whose scales are downy and obtuse. Stem prostrate. Ultimate branches hairy.—Found by Mr. Brown, in stony ground at the roots of the mountains in Van Diemen's island, towards the south.

11. *B. patula*. Spreading Banksia. Br. n. 11.—Leaves linear, somewhat wedge-shaped, abrupt, pointed, very sparingly toothed; reticulated with veins beneath. Scales of the catkin downy at the summit and obtuse. Keel of the limb of the corolla smooth. Stem diffuse. Ultimate branches downy.—Discovered by Mr. Brown, in Flinders' land, on the fourth coast of New Holland, growing amongst other shrubs, in barren elevated spots.

12. *B. australis*. South-coast Banksia. Br. n. 12.—Leaves linear, abrupt, pointed, entire, revolute; reticulated with veins beneath. Ultimate branches downy. Scales of the catkin obtuse, nearly equal; downy at the summit. Keel of the limb of the corolla very slightly filky. Stem arboreous.—Observed by Mr. Brown, every where in the open fields of Van Diemen's island, as well as by the sea-side; and also on the fourth coast of New Holland, near Port Phillip.

13. *B. infularis*. Infular Banksia. Br. n. 13.—Leaves linear-oblong, or somewhat wedge-shaped, slightly rounded, pointed, either scattered or whorled; reticulated with veins beneath. Scales of the catkin obtuse, externally downy. Follicles compressed; smooth at the summit.—Native of the islands of the Bass Strait, as well as of that of Van Diemen, near the shore. Brown.

14. *B. integrifolia*. Entire-leaved Banksia. Linn. Suppl. 127. Willd. n. 3. Ait. n. 9. Banks Ic. Ined. t. 3. Cavan. Ic. v. 6. 30. t. 546. (*B. oleacea* folia; Cavan. Ic. v. 6. 30. t. 545. *B. glauca*; Cavan. Ic. v. 6. 31. *B. spicata*; Gertn. t. 48.)—Leaves whorled, oblong-lanceolate, entire, pointed; reticulated with conspicuous veins beneath. Follicles downy. Stem arboreous.—Native of the east coast of New Holland, near the sea-shore at Port Jackson. This is generally a small, or middle-sized, tree. Leaves narrow-obovate, for the most part acute; tapering at the base; white beneath. The twin scales of the catkin obtuse; solitary one acute, and only half as large.

Mr. Brown says this is a very variable species, too nearly akin to the last, as well as to that immediately following. He observed on the fourth coast, near Port Phillip, a variety which forms a large tree, with lanceolate-oblong, mostly rather obtuse, leaves, acute at their base; the solitary scales of the catkin rather acute, but more than half the size of the twin ones.

15. *B. compar*. Doubtful Banksia. Br. n. 15.—Leaves scattered, oblong-tongue-shaped, obtuse, pointlets; veinlets and snow-white beneath. Branches, and scales of the catkin, downy. Corolla filky. Stem arboreous.—Found by

BANKSIA.

Mr. Brown, but not in fruit, by the sea-side at Keppel Bay, on the east coast of New Holland. He suspects it to be a variety of the last.

16. *B. verticillata*. Whorled Banksia. Ait. n. 10.—Leaves whorled, oblong-tongue-shaped, obtuse, pointless; veinless and snow-white beneath. Scales of the catkin downy, obtuse. Bractæes at the base hairy. Stem arborescent.—Gathered by Mr. Brown, in Lewin's land, near the sea-side. Mr. Menzies also met with this species on the south-west coast of New Holland.

17. *B. coccinea*. Scarlet-flowered Banksia. Ait. n. 11.—Leaves alternate, wedge-shaped-obovate or oblong, toothed, abrupt, ribbed, reticulated with veins; transverse at the base. Scales of the catkin awl-shaped. Corolla woolly. Stigma pyramidal.—Found by Mr. Brown in Lewin's land, in fields near the coast. It was sent to Kew, by Mr. Good, in 1803.

18. *B. paludosa*. Marsh Banksia. Ait. n. 12.—Leaves imperfectly whorled, wedge-shaped-oblong, somewhat abrupt; tapering at the base; slightly revolute; coarsely serrated beyond the middle; ribbed and reticulated with veins beneath. Footstalks and young branches smooth. Corolla silky. Stem shrubby.—Gathered by Mr. Brown, in marshy ground, near Port Jackson. It is said to flower in the green-house at Kew, from January to March.

19. *B. oblongifolia*. Oblong-leaved Banksia. Cavan. Ic. v. 6. 28. t. 542. Ait. n. 13. (*B. falcifolia*; Cavan. Ic. v. 6. 31?)—Leaves scattered, narrow-oblong, abrupt, strongly serrated; rather acute at the base; ribbed, and reticulated with veins, beneath. Footstalks and young branches downy. Larger scales of the catkin pointed. Corolla silky. Stem shrubby.—Seen by Mr. Brown on heaths near Port Jackson. The leaves, according to his observations, are sometimes entire, or nearly so, (as we judge in this case from the word *integra*), and therefore may answer to the *falcifolia* of Cavanilles, of which it is difficult to judge precisely, for want of a figure.

20. *B. latifolia*. Broad-leaved Banksia. Br. n. 20. Ait. n. 14. (*B. robur*; Cavan. Ic. v. 6. 29. t. 543.)—Leaves obovate-oblong, with spinous serratures; acute at the base; ribbed, reticulated, downy and grey beneath. Tube of the corolla silky; limb smooth. Stem shrubby.—Observed by Mr. Brown, in boggy situations near Port Jackson; plentiful about the town of Sydney, where it rarely ripens seed. That accurate botanist informs us the stem is usually three or four feet high, scarcely ever six feet. Louis Née, from whom Cavanilles had his information, appears to have accidentally confounded his specimens of this species, with his memorandums relating to *B. ferrata*, and hence it is described of the size of an Oak, to which the name *robur* alluding, was necessarily obliged to be changed.

21. *B. mucroscens*. Short-leaved Banksia. Br. n. 21. Ait. n. 15. (*B. præmorfa*; Andr. Repof. t. 258.)—Leaves wedge-shaped, flat, scattered, abrupt, strongly serrated more than half way down; rather acute at the base. Branches downy. Corolla permanent, smooth as well as the foliicles.—Native of the southern coast of New Holland; at Lewin's land, near the shore. Mr. Andrews says this species was first raised from seed at Kew, in 1788. Mr. Brown and Mr. Aiton, on the contrary, mark it as introduced in 1794, by its first discoverer Mr. Menzies. The stem is six or seven feet high in the green-house. Leaves so abrupt, that we could almost have allowed the name *præmorfa* to remain. Flowers purple, in large handsome catkins; inside of the corolla white.

22. *B. attenuata*. Smooth-flowered Banksia. Ait. n. 16.—Leaves elongated and nearly linear, abrupt; tapering at

the base; serrated more than half way down; ribbed and reticulated, with downy interferences, beneath. Scales of the catkin hairy at the summit. Corolla smooth. Follicles downy.—This also was discovered by Mr. Menzies, on the southern coast of New Holland; and seen by Mr. Brown in Lewin's land, near the sea-coast. It was raised at Kew, in 1794, but appears not yet to have flowered; nor have we heard of the plant elsewhere.

23. *B. elatior*. Tall Banksia. Br. n. 23.—Leaves elongated and nearly linear, serrated, rather abrupt; reticulated, and almost smooth when full grown, beneath. Scales of the catkin beardless, but, like the corolla, downy. Style quite smooth. Stigma oval-club-shaped. Stem arborescent.—Discovered by Mr. Brown, on the east coast of New Holland, by the sea-side, at Sandy Cape.

24. *B. ferrata*. Great Serrated Banksia. Linn. Suppl. 126. Willd. n. 1. Ait. n. 17. Banks Ic. Ined. t. 2. White's Voy. 222. t. 18, 19, 20. Andr. Repof. t. 82. Cavan. Ic. v. 6. 27. t. 540. (*B. conchifera*; Gært. n. 48.)—Leaves linear-oblong, abrupt, rather bluntly serrated; reticulated and nearly smooth beneath; tapering at the base. Lower part of the style downy and powdery. Stigma cylindrical, furrowed; obliquely swelling at the base. Stem arborescent.—Native of the east coast of New Holland, at Port Jackson, in fields near the sea, from whence specimens were brought by sir Joseph Banks; but the plant was first raised in England, by Messrs. Lee and Kennedy, in 1788. This is described as the most stately of its genus, rising to the height of thirty feet, with a hard reddish wood. The leaves are near a span long, almost perfectly smooth on both sides, not so deeply serrated as in the figures of Andrews or Cavanilles, or in White's t. 20, but rather bordered with a series of rectangular bluntish notches. Catkins large, thick and heavy, of innumerable downy flowers, whose corolla is purplish, and style crimson. Cone ten inches long, very heavy. Follicles downy, an inch in diameter. Gærtner's figure is from a poor diminutive cone.

25. *B. amula*. Large-fruited Banksia. Br. n. 25.—Leaves linear-oblong, abrupt, deeply and sharply serrated; reticulated and nearly smooth beneath. Corolla silky. Stigma capitate, polished, pyramidal, not furrowed, twice as thick as the style. Stem shrubby.—Native of heaths, and sandy fields, near Port Jackson, from whence we long ago received specimens, with full-grown fruit, by the kindness of Dr. White. We have been used to call this species *B. macrocarpa*, a name well expressing its singularly large follicles, which are twice the dimensions of the preceding, though the whole cone is usually much shorter. It is impossible to mistake Mr. Brown's faithful specific definition, especially the character of the short pyramidal stigma. The leaves are much smaller than those of *B. ferrata*, though their serratures are much deeper and sharper. Hence Mr. Brown was led to apply t. 20 of White's Voyage to the present species, with which the leaves in that figure pretty nearly agree; but the cone certainly, to our knowledge, belongs to the *ferrata*, which it well expresses, except being too small. The serratures in Mr. Andrews's plate of *ferrata* most nearly approach our present plant. The shape and proportion of the catkin moreover best agrees herewith.

26. *B. dentata*. Broad-toothed Banksia. Linn. Suppl. 127. Willd. n. 5. Banks Ic. Ined. t. 5.—Leaves wedge-shaped-oblong, abrupt, sinuated and wavy, with broad spinous teeth; contracted at the base; snow-white, ribbed, and finely veiny, beneath. Corolla silky. Capsules downy.—Discovered by sir Joseph Banks and Dr. Solander, near Endeavour river, in the tropical part of New Holland. Mr. Brown also met with this noble species, which as yet is a stranger

stranger to our gardens, at Arnhem's land, on the northern coast. Of the height or size of the plant we are not informed. The branches are rusty and somewhat downy. Leaves alternate, from a span to a foot long, on short stalks; their margins remarkably undulated, and bordered with broad, shallow, spinous-pointed teeth. *Catkins* six inches long, more slender than usual; their scales downy, the larger one to each pair of flowers spinous-pointed.

27. *B. quercifolia*. Oak-leaved Bankfia. Ait. n. 18.—Leaves oblong-wedge-shaped, rather abrupt, smooth, deeply serrated, pointed. Segments of the corolla awned. Follicles nearly smooth.—Found by Mr. Brown, in fields near the shore, in Lewin's land. The awns of the corolla are indicated by him as a very remarkable character.

28. *B. speciosa*. Long-leaved Bankfia. Ait. n. 19.—Leaves linear, pinnatifid; lobes triangular-halfovate, pointed; snow-white and lightly ribbed beneath. Limb of the corolla woolly. Style rather hairy. Follicles downy.—Native of the rocky sea-shore of Lewin's land, where it was found by Mr. Brown, and sent to Kew, with the last, in 1805.

29. *B. grandis*. Great Winged Bankfia. Willd. n. 2. Br. n. 29. Ait. n. 20.—Leaves deeply pinnatifid; lobes triangular-ovate, acute, flat; very many-ribbed, and nearly smooth, beneath. Corolla and follicles smooth.—Gathered by Mr. Menzies, at King George's sound, on the west coast of New Holland. Mr. Brown met with the same on rocky hills in Lewin's land. Seeds were sent to Kew in 1794, where this magnificent shrub thrives well, in the green-house, but has not yet flowered. Willdenow's specific name alludes, we presume, to the foliage, and not to the flowers, with which he was not acquainted. The leaves are twelve or fourteen inches long, pinnatifid to the very rib; abrupt at the extremity; lobes numerous, more or less alternate, crowded, transverse, coriaceous, entire, rather spinous-pointed; roughish to the touch on the upper side; paler underneath, furnished with five principal ribs, and many intermediate vein reticulations; they diminish gradually towards the top, and especially towards the base, of the leaf. We have seen no flowers nor fruit.

30. *B. repens*. Creeping Bankfia. Labill. Voy. v. 1. 412. t. 23. Br. n. 30. Ait. n. 21.—Leaves pinnatifid; lobes sinuated or toothed. Stem prostrate.—Found by Labillardiere, on calcareous rocks on the fourth-west coast of New Holland, where also Mr. Brown met with this species. It flowers there in December. The creeping stem is clothed with rusty down. Leaves a span long, stalked, erect, deeply pinnatifid, but not quite to the rib, which is winged nearly all its length; they are downy when young, but finally very smooth. *Catkins* ovate, nearly sessile, erect, dense, many-flowered, about three inches long. Corolla and germen hairy.

Sect. 2. Points of the corolla more speedily separating; the narrow part of their segments covering longitudinally, and as long as the style. Catkin short and level-topped, perfecting scarcely more than one vertical follicle.

31. *B. ilicifolia*. Holly-leaved Bankfia. Br. n. 31.—Leaves wedge-shaped, deeply serrated; nearly smooth beneath. *Catkins* very short.—Gathered by Mr. Brown, in fields and hilly ground near the sea-coast, in Lewin's land. This species is so singular, that its learned discoverer appears to have been inclined to make it a distinct genus, by the name of *Islylytis*. He remarks that it forms a connecting link between *Bankfia* and *DRYANDRA*; see the latter hereafter.

BANNIUM, in *Ancient Geography*, a Roman station, called Gaer, or Caer Bannau, situated about three miles above the town of Brecknock, in South Wales, near the confluence of the rivers Yakin and Uik. The camp is a

parallelogram, 624 feet by 456, having its longest parallels in a direction nearly S. and N. The foundation of the wall that encompassed this area remains still entire, and may be traced through the underwood that has overgrown and concealed it. In this situation there is a caufeway, supposed to have been a branch of the great Roman caufeway leading from Caerleon, in Monmouthshire, through the vale of Uik, and the eastern part of Brecknockshire to Ariconium, which is the 12th Iter in Antonine's Itinerary.

BANQUETTE. Add—See **BREAST-WORK**.

BANTAM, col. 1, l. 50, after settled there, infer—That of the English was established in 1601, and maintained until 1683. That of the Dutch was erected in the year 1595, and this was their first settlement in the Spice islands, which had been first visited by the Portuguese in 1510. The English made no attempt to recover a free port in Java until the year 1811, when Holland became a province of France, and the Dutch colonies were induced to accept the protection of Great Britain.—Col. 3, at the close of Bantam, add—Raffles's History of Java, 2 vols. 4to. 1817.

BAPTISIA, in *Botany*, so called by the late M. Ventenat, from βαπτίζω, to colour by immersion, to dye, because a tincture of the leaves, of some of the species, is said to be scarcely inferior, in that respect, to Indigo.—Venten. Decas Gener. Novor. 9. Brown in Ait. Hort. Kew. v. 3. 5. (Podalyria; Michaux Boreal.-Amer. v. 1. 263. Pursh 307. Lamarck Illust. t. 327. f. 1.)—Class and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceae*, Linn. *Leguminosae*, Juss.

Gen. Ch. Cal. Perianth inferior, of one leaf, bell-shaped, permanent, cut half way down into four or five segments, forming two lips; its base externally convex. Cor. papilionaceous, of five petals. Standard inversely-heart-shaped, reflexed at the sides, with a thick claw. Wings two, nearly as long as the standard, half-obovate, converging at their upper edges. Keel as long as the wings, of two oblong converging petals. Stam. Filaments ten, awl-shaped, ascending, equal, inserted into the base of the calyx, deciduous; anthers roundish, two-lobed. Pist. Germen superior, stalked, ovate or elliptical; style longer than the stamens, ascending; stigma capitate, hemispherical. Peric. Legume on a stalk longer than the calyx, elliptic-oblong, turgid, membranous, of one cell. Seeds numerous, elliptical, stalked.

Ess. Ch. Calyx two-lipped, divided half way down into four or five segments. Corolla papilionaceous; petals all nearly of equal length; standard reflexed at the sides. Stamens distinct, deciduous. Legume inflated, stalked, with many seeds.

To this genus we have already adverted, under the article *PODALYRIA*, as comprising the North American species of that genus, as it stands in Lamarck and Willdenow. They are doubtless sufficiently marked by the above characters, to form a genus by themselves. They are herbaceous, perennial, many of them glaucous, and have mostly the quality of dyeing blue. Leaves ternate, except the first, with a pair of rather large stipules. Flowers mostly racemose, with small partial bractees; their colour blue, white, or yellow.

1. *B. perfoliata*. Perfoliate Wild Indigo. Ait. n. 1. (*Rafnia perfoliata*; Willd. Sp. Pl. v. 3. 949. *Podalyria perfoliata*; Pursh n. 1. *Crotalaria perfoliata*; Linn. Sp. Pl. 1003. Sm. Inf. of Georgia, v. 2. 133. t. 67. *C. perfoliata* folio; Dill. Elth. 122. t. 102.)—Leaves simple, perfoliate, roundish, entire. Flowers axillary, solitary.—Native of Carolina and Georgia, in dry barren fields, flowering

flowering in July. The whole plant is very smooth, scarcely glaucous, two or three feet high, distinguished by its perfoliate, almost orbicular leaves, about two inches broad, accompanied by lemon-coloured flowers, on short simple stalks. *Legume* nearly globular.

2. *B. uniflora*. Downy Single-flowered Wild Indigo. (*Podalyria uniflora*; Michaux Boreal-Amer. v. 1. 263. Pursh n. 2. *Sophora lanceolata*; Walt. Carol. 135.)—Leaves ternate, feffile, downy; leaflets lanceolate, obtuse. Stipulas bristle-shaped, minute. Flowers axillary, solitary.—Observed by Michaux in Carolina and Georgia. The whole herbage is downy, as well as the calyx. *Flowers* stalked, yellow.

3. *B. villosa*. Downy Clustered Wild Indigo. (*Podalyria villosa*; Michaux ibid. 261. Pursh n. 3. *Sophora villosa*; Walt. Carol. 134.)—Leaves ternate, nearly feffile, downy beneath; leaflets elliptic-oblong, obtuse. Stipulas linear. Cluster terminal, dense. Calyx four-cleft.—In low sandy grounds of Virginia and North Carolina, flowering in June and July. Resembles a Lupine very much. *Flowers* yellow. *Pursh*. Michaux says the flowers are pale, nearly feffile; Walter calls them “*cinerea*.”

4. *B. australis*. Blue-flowered Wild Indigo. Ait. n. 2. (*Podalyria australis*; Willd. Sp. Pl. v. 2. 503. Venten. Hort. Celf. t. 56. P. cærulea; Mich. ibid. 264. Pursh n. 4. *Sophora australis*; Linn. Syft. Veg. ed. 13. 325. Mant. 378. Curt. Mag. t. 509. S. cærulea; “Trew Pl. Rar. 6. t. 14.”)—Leaves ternate, stalked, smooth; leaflets lanceolate, somewhat wedge-shaped. Stipulas lanceolate, longer than the footstalk.—On the banks of rivers in Virginia and Carolina, particularly in the western districts, flowering in June and July. *Pursh*. A hardy perennial in our gardens, about two feet high, smooth in every part, of a fine glaucous-green, with erect clusters of large handsome blue flowers; the standard and wings striped with a darker blue; the keel white.

5. *B. alba*. White-flowered Wild Indigo. Ait. n. 4. (*Podalyria alba*; Willd. Sp. Pl. v. 2. 503. Mich. ibid. 264. Pursh n. 5. Curt. Mag. t. 1177. *Sophora alba*; Linn. Syft. Veg. ed. 13. 325. *Crotalaria alba*; Linn. Sp. Pl. 1006. *Anonis caroliniana*-perennis; non spinosa, &c. Mart. Cent. t. 44.)—Leaves ternate, stalked, smooth; leaflets elliptic-oblong. Stipulas awl-shaped, shorter than the footstalk, deciduous. Germs smooth.—In the western parts of Virginia and Carolina, on the banks of rivers, flowering in June and July. *Pursh*. Hardy in our gardens, but not of frequent occurrence. Catesby first introduced it in 1724. The habit of this species, its smoothness, and rather glaucous hue, agree with the last, to which it is certainly most nearly allied; but the leaflets are elliptical, the flowers white, more oblong, in consequence of the greater length of the wings and keel, the stipulas smaller and deciduous. The corolla is here and there spotted with brown, and is reported to be sometimes blue. Some of the flowers, in both these species, are often whorled, and give the cluster an interrupted form, like that of a Lupine, the aspect of which genus is otherwise visible in these plants.

6. *B. mollis*. Soft Wild Indigo. (*Podalyria mollis*; Mich. ibid. 264. Pursh n. 6.)—“Herbage and calyx minutely downy. Leaves ternate; leaflets lanceolate, slightly rhomboid. Stipulas lanceolate, leafy. Cluster spiked, terminal. Teeth of the calyx acute.”—Found by Michaux in the county of Mecklenburg, Upper Carolina. Perennial. *Flowers* deep yellow. *Michaux*.

7. *B. tinctoria*. Common Wild Indigo. Ait. n. 3. (*Podalyria tinctoria*; Willd. Sp. Pl. v. 2. 503. Mich. ibid. 265. Pursh n. 7. Lamarck f. 1. Curt. Mag.

t. 1099. *Sophora tinctoria*; Linn. Sp. Pl. 534. *Cytisus procumbens* americanus, flore luteo, ramifissimus, qui Anil suppediat apud Barbadienum colonos; Pluk. Phyt. t. 86. f. 2.)—Leaves ternate, somewhat stalked, smooth; leaflets roundish-obovate. Stipulas fetaceous, obsolete. Flowers racemose.—In woods on dry hills, from Canada to Carolina, flowering in July and August. Called Wild Indigo. *Pursh*. A low, partly procumbent, smooth plant, whose numerous branches are each terminated by a simple cluster of yellow flowers, about half the size of *B. australis*. The pods are ovate, on stalks much longer than the permanent calyx. This species is said to have been cultivated for Indigo, in the North American settlements, and even in Barbadoes, before the true *Indigofera* was introduced. It is tolerably hardy with us, in a dry soil and sheltered situation, but has nothing to recommend it for general cultivation.

BAR, in *Heraldry*, r. Plate III.

BAR, *Trial* at. See JURY.

BARACKS, col. 2, add—See CASERNS.

BARAQUICIMITO, *dele* lat. and long., and add—See BARQUISIMETO.

BARBAREA, in *Botany*, a name used by Dodonæus, because this plant had been called the Herb of St. Barbara by some preceding botanists. It has always been referred to ERYSIMUM, (see that article), till Mr. Brown raised it to the rank of a separate genus, under the above appellation, in Ait. Hort. Kew. v. 3. 109.—Class and order, *Tetradynamia Siliquosa*. Nat. Ord. *Siliquosæ*, Linn. *Cruciferae*, Juss. Eff. Ch. Pod quadrangular, compressed. Cotyledons accumbent. Seeds in a single row. Calyx erect. Glands between the shorter fitmens and the germs.

Two species only are described.

1. *B. vulgaris*. (*Erysimum Barbara*; Linn. Sp. Pl. 922. Sm. Fl. Brit. 706. Fl. Dan. t. 985.) See ERYSIMUM, n. 2.

2. *B. præcox*. See the same article, n. 3.

Mr. Brown thus defines ERYSIMUM.

Eff. Ch. Pod quadrangular. Seeds without a border. Cotyledons incumbent. Stigma capitate; sometimes emarginate, with spreading lobes. Calyx closed.

We have explained the terms *accumbent* and *incumbent*, as thus technically used, under the article TETRADYNAMIA, where a more particular account is given of our ingenious friend's arduous undertaking, of reforming the genera of the natural order in question.

BARBAREËN. See CALTURA.

BARBET, in *Fortification*. See BATTERY.

BARBOURVILLE, in *Geography*, a town of Kentucky, in Knox county, containing 55 inhabitants, eight of whom are slaves.

BARBULA, in *Botany*, so called by Hedwig, in allusion to the beard-like fringe of the capsule. See TORTULA.

BARDSTOWN. Add—See BEARSTOWN.

BARETTI, col. 2, l. 27, for Burke r. Bowle.

BARILLA. Add—See CARBONATE OF SODA.

BARUM, in *Chemistry*, the metallic base of barytes. (See BARYTES, *infra*.) Dr. Clarke has lately proposed the name of *Plutonium* for this metal.

BARK-PIT, col. 4, l. 19, for *Gardening* r. *Bark-beds*, &c.

BARKHAMPSTEAD, in *Geography*, a town of Litchfield county, in Connecticut, having 1566 inhabitants.

BARKWAY, l. ult. r. Its houses in 1811 amounted to 99, and its inhabitants to 686.

BARLEY, CAUSTIC, *Indian*, &c. *dele*.

BARNARD, in *Geography*, l. 2, for 673 r. 1648.

BARNARD-Castle, l. ult. for 310 r. 450; and for 2966 r. 2986; add—1312 being males, and 1674 females.

BARNËT,

BARNET, l. *ult. r.* parish are 259 houfes, inhabited by 1579 perfons; 755 males, and 824 females.

BARNET, in America, for 477 r. 1301.

BARNSTAPLE. At the clofe r. in the borough and parish is fitated by the return in 1811 to be 628, and of perfons 4019, *viz.* 1633 males, and 2386 females.

BARNSTAPLE, or *Barnstable*, American county, l. 6, r. 22, 211. Do. col. 2, l. 25, for 2610 r. 3646.

BARNWELL, a diftrict of South Carolina, containing 12,280 inhabitants, including 4153 flaves.

BAROMETER, col. 7, l. 17, r. 68-hundredth parts of, &c. Col. 14, l. 40, add—We obferve, however, that it is merely a floating manometer, and as fuch more influenced by the temperature than the denfity of the atmofphere, and therefore not to be fo much depended upon as to warrant the high commendation above given to it. Col. 68, l. 36, r. 42—32. Col. 69, l. 6 from bottom r. 29.4 + 25.19.

BARON, col. 1, l. 21 from bottom, for *Minerva r. Minerva*.

BARQUISIMETO, in *Geography*, a city of America, in the government of Caracas, 40 leagues W.S.W. of Caracas, 150 leagues N.N.E. of Santa Fé, and 15 leagues from Tocuyo. N. lat. 9° 45'. The exceffive heat is rendered fupportable by the cooling breeze arifing from its elevated fituation. The adjacent plains are covered with excellent paffurage favourable for rearing every marketable animal. The fugar-cane and the belt wheat are alfo cultivated. The vales produce excellent cacao; and the fides of the hills are devoted to the culture of coffee. This city accommodates 11,300 perfons; its houfes are well built, and the ftreets are fo laid out as to afford a free circulation of air. It has a parish-church and two officiating priefts, a monaftery of Francifcans, and a hofpital badly attended.

BARRE', a township of America, l. 2, r. 1971; l. 11, add—having 1053 inhabitants.—Alfo, a town of Vermont, in Orange county, having 1660 inhabitants.

BARREL. By 43 Geo. III. c. 69. every 36 gallons of beer or ale brewed by the common brewers in Great Britain, taken according to the ftandard of the ale quart, four thereof to the gallon, in the exchequer, fhall be reckoned by the gauger or other officer of excife for a barrel of beer or ale.

BARREL, a weight by which corn is fold in Ireland. The barrel of wheat, peas, beans, and rye, is 20 ftone: of barley, here, and rape-feed, 16 ftone; of oats 14, and in fome places 12 ftone; of malt, 12 ftone: the ftone being 14 lbs. avoirdupois weight. A barrel of good wheat anfwers to about four Winchefter buhels.

BARREN FLOWERS, in *Botany and Vegetable Phyfiology*, *Flores mafculi* in Linnæan terminology, are fuch as are not provided with organs for the formation of fruit or feed, but only with *flamens* for its impregnation. See FERTILIZATION of *Plants*.

BARRIER, in *Fortification*. Add—See CHEVAL de *Friſe*, HERISON, KLINKETS, and TURNSTILE.

BARRILE, plur. BARRILI, a liquid meafure in Italy.

BARRIN, in *Geography*, a county of the diftrict of Kentucky, containing 11,042 inhabitants, of whom 1656 are flaves. The town, Glasgow, has 244 inhabitants, of whom 68 are flaves.

BARRINGTON, a township in Strafford county, &c. l. 3, for 2470 r. 3564. Id. l. 5, for 683 r. 604. Id. l. 2, for 1373 r. 1784.

BARRIQUE, a meafure for wine and brandy in fome

parts of France, as at Bourdeaux, Rochelle, &c. At Bourdeaux, a tonneau of wine contains 4 barriques or hogfheads = 50 fekans in Amfterdam, 259 ftubgen in Hamburgh, or 243 Englifh gallons; and weighs with the wood about 2000 lbs. of Bourdeaux. The barrique contains 110 pots, or 32 veltes.

BARRY-BENDY, &c. *Plate III. Heraldry*, &c.

BART, in Lancafter county, add—It contains 1099 inhabitants.

BARTHELEMY, a river of Louifiana, which rifeſ near the Arkansas, and after a courſe generally from N. to S. of 100 miles, falls into Ouachitta, 3 miles below the Derbane, on the contrary fide.

BARTHOLINA, in *Botany*, a genus of the *Orchis* family eſtabliſhed by Mr. Brown, and dedicated by him to the memory of the great Daniſh anatomift and phyfiologiſt, THOMAS BARTHOLIN, whoſe life is already given in its proper place, and whoſe various writings relating to plants, in the old Copenhagen Tranſactions, entitle us to adorn the hiſtory of our ſcience with his truly illuſtrious name.—Brown in *Ait. Hort. Kew. v. 5. 194.*—Clafs and order, *Gynandria Monogynia*. Nat. Ord. *Orchidee*.

Gen. Ch. Cal. Perianth ſuperior, of one leaf, tubular at the baſe, deeply divided above into three, elliptic-oblong, equal, ribbed, ſpreading ſegments, externally hairy. Cor. Petals two, linear-lanceolate, erect, ſmooth, taper-pointed, nearly twice the length of the calyx. Nectary a large ſpreading lip, united to the baſe of the petals, thrice the length of the calyx, in three deep principal lobes, the middle one broadest, all divided, more than half way down, into many linear, fringe-like ſegments, and terminating behind in a tumid, curved, bluntly-pointed ſpur, rather longer than the tube of the calyx. Stam. Anther pointed, of two oblong, rather diſtant, parallel cells, opening in front, attached to the two margins of the ſtyle; maſſes of pollen each ſupported on a long, membranous-bordered ſtalk, to which their cells are laterally attached, "their glands diſtinct, half covered by the exterior lobe." *Piſt.* Germen inferior, elliptic-oblong, curved, very hairy; ſtyle flattened, much ſhorter than the calyx; ſigma a cavity between the lobes of the anther. *Peric.* Capſule.....

Eſſ. Ch. Calyx tubular at the baſe. Petals united to the baſe of the lip, whoſe ſpur is ſhorter than the germen. Stalks of the pollen elongated; their cells laterally fixed; "glands diſtinct, half covered by the exterior lobe."

1. *B. peſtinata*. Fringed Bartholina. *Ait. n. 1.* (*Orchis Barmanniana*; Linn. Sp. Pl. 1334. *Am. Acad. v. 6. 108.* "Swartz in Web. and Mohr *Archiv. v. 1. 55. t. 3.*" *O. peſtinata*; Thunb. *Prodr. 4. Fl. Cap. v. 1. 45.* Willd. Sp. Pl. v. 4. 11. *Arethufa ciliaris*; Linn. *Suppl. 405.*)—Gathered by Thunberg and Sparrmann, on the fides of hills at the Cape of Good Hope, in Roode Sand, as well as near Cape Town, flowering from October to December. The root conſiſts of two ovate hairy knobs, the ſize of a horſe-bean. *Leaf* ſolitary, radical, orbicular, clafping the flower-ftalk, an inch broad, horizontal, fleſhy; ſmooth, and of a fine green, on the upper ſide; paler and veiny beneath; the margin reflexed, and very denſely fringed. *Flower-ftalk* ſolitary, ſimple, ſingle-flowered, five or fix inches high, erect, hairy, with a ſolitary, funnel-shaped, hairy *bractea*, half an inch long, near the top. *Flower* large, of a very fingular aſpect. *Calyx* green, converging, ſtrongly ribbed, and externally hairy, near an inch long, its tube included. *Petals* whitith, with a blue mid-rib, and a ſtripe of the ſame colour in their lower part. *Lip* two inches in length and breadth, ſpreading, ſnely cut; its ſegments white above, blue underneath, the throat dotted and minutely ſtreaked with

with blue. *Spur* greenish-white. Masses of *pollen*, (which Linnæus in the *Supplement* has described as a pair of styles,) inserted into the base of the style, yellowish, prominent, very conspicuous even in dried specimens.

BARTLET, a town of America, in Coos, &c. r. 436.

BARTON, in Orleans county, &c. add—it contains 447 inhabitants.

BARTON-upon-Humber, l. ult. for 412 r. 101—for 1709 r. 1129. The parish of Barton, St. Mary, has 209 houses and 976 persons; and the parish of St. Peter has 260 houses, and 1228 persons.

BARTONIA, in *Botany*, received that name from Dr. Sims, in 1812, in just commemoration of the scientific merits and zeal of Dr. Benjamin Smith Barton, at that time professor of botany and natural history, in the university of Pennsylvania, who after many exertions, and several publications, in the service of natural science, died of hydrothorax, at Philadelphia, on the 10th of December 1815, in the fiftieth year of his age. His nephew, Dr. William Barton, in an animated and interesting "Biographical Sketch" of his character and pursuits, has preserved some account of the plants which compose this genus, written by the late professor, three or four days before his death, and accompanied by many particulars, relative to Mr. Pursh and Mr. Nuttall, through whose means it has come to the knowledge of European botanists; all which evince a love of science, that the most painful bodily sufferings could not suppress.—Sims in Curt. Mag. 1487. Pursh 327. Ait. Epit. 364.—Class and order, *Isoandra Monogynia*. Nat. Ord. *Loasæe*, Juss. Ann. du Mus. d'Hist. Nat. v. 5. 18. Sims.

Eff. Ch. Calyx superior, in five deep segments. Corolla of many petals, with claws. Stamens uniform. Capsule cylindrical, of one cell, with a lid of three or five valves, and as many parietal receptacles. Seeds numerous, flat, in double rows.

1. *B. ornata*. Large-flowered *Bartonia*. Pursh n. 1. Ait. n. 1. (B. decapetala; Sims as above, t. 1487.)—Germen leafy. Seeds without a wing.—Found by governor Lewis, in 1804, on chalky soil on the borders of the Missouri, flowering in July and August. *Pursh*. Professor Barton records that Mr. Nuttall first made this fine plant known to him in 1811, having found it growing all the way from the river Platte to the Andes, on broken hills and in the clefts of rocks. Mr. Pursh by mistake, as the professor thought, speaks of the soil as volcanic. Living plants were brought to England by Mr. Nuttall, who is unquestionably entitled to the honour of this discovery, as he could not know what might be concealed in the herbarium of any deceased traveller. The figure in the Magazine, though taken from a dried specimen, is unexceptionable, as far as it goes. The herb is biennial, downy, glaucous, about three feet high. Leaves alternate, sessile, oblong, pinnatifid. Flowers terminal, enveloped in leaves, three inches broad, with about ten elliptical, acute, white petals, and numerous stamens, half as long, whose anthers are elliptical, yellowish. These flowers expand suddenly in an evening, diffusing a most agreeable odour, and rival those of some of the fine species of *Cañus* in elegance.

2. *B. nuda*. Small-flowered *Bartonia*. Pursh n. 2. Ait. n. 2.—Germen naked. Seeds winged.—Found by Mr. Nuttall, on gravelly hills near the Grand Detour of the Mississippi, flowering in August. Root perennial. Petals more numerous. *Barton*. Mr. Pursh observes that this has smaller flowers than the foregoing, and less glaucous leaves. The petals vary in number, from ten to fifteen.

We have seen no specimens, and have scarcely sufficient materials for drawing up a full generic character.

BARTRAMIA, is intended to commemorate the venerable John Bartram, the friend of Collinson, Dillenius, Fothergill, and Linnæus, to whom gardeners and botanists are indebted for some of the most valuable plants of North America. The original *Bartramia* of Linnæus, having been referred by its author himself to *TRIUMFETTA*, (see that article,) Hedwig has transferred the name to a fine, and very distinct, genus of Mosses, now universally received.—Hedw. Crypt. v. 2. 111. Sp. Musc. 164. Schreb. Gen. 761. Sm. Fl. Brit. 1339. Engl. Bot. v. 14. 997. Compend. 182. Turn. in Sims and Kon. Ann. of Bot. v. 1. 522. Musc. Hib. 106. Hooker and Taylor Musc. Brit. 85. t. 3.—Class and order, *Cryptogamia Musci*. Nat. Ord. *Musci*.

Eff. Ch. Capsule spherical, furrowed. Outer fringe of sixteen teeth, dilated at the base; inner membranous, plaited, deeply lacinated. Veil smooth. Lid depressed.

Eight species are described in Engl. Bot. and Compend. Fl. Brit., and there are several of exotic growth.

Seçt. 1. *Fruit-stalks shorter than the stem*.

1. *B. Halleriana*. Lateral *Bartramia*. Hedw. Crypt. v. 2. 111. t. 40. Engl. Bot. t. 997. Hook. and Tayl. n. 5. t. 23. (Bryum laterale; Hudf. 483. Ehrh. Crypt. 33. B. n. 1802; Hall. Hist. v. 3. 43. t. 46. f. 8.)—Fruit-stalks lateral, curved, shorter than the linear-awl-shaped, single-ribbed, rough-edged leaves.—Native of moist rocky mountainous woods, in Switzerland, Germany, Scotland, Wales, and the north of England. The stems are, as Mr. Hooker observes, perennial, and repeatedly proliferous, so that, although the flowers are, like every *Bartramia*, originally terminal, the fruit soon becomes lateral, and remaining two or three years, is found numerously ranged along the main stem, among the dense, slender leaves. When ripe it becomes strongly furrowed, though originally smooth or even.

2. *B. arcuata*. Curve-stalked *Bartramia*. Engl. Bot. t. 1237. Fl. Brit. n. 5. Hook. and Tayl. n. 6. t. 23. (Mnium arcuatum; Dicks. Crypt. fasc. 3. 2. t. 7. f. 3. M. chrysocomum; Hedw. Sp. Musc. 74. Hypnum palustre erectum, comâ lutea, basi nigricante; Dill. Musc. 302. t. 39. f. 36.)—Fruit-stalks recurved. Leaves lanceolate, single-ribbed, furrowed, finely serrated. Branches scattered, spreading.—Native of mountains in Great Britain and Ireland. According to Mr. Hooker, it is found, in the greatest abundance, on wet rocks, at Lowdore and Kefwick, Cumberland, and is also very common in the mountainous districts of Ireland, though unknown on the continent of Europe. With all deference to our worthy friend however, the ripe capsule is as decidedly furrowed as in any other species. The more branched and tufted habit of this moss, and the broader, shorter, rigid, yellowish, more spreading leaves, at once distinguish it from the foregoing. The fruit-stalks soon become lateral, and are wavy rather than recurved, longer than in the preceding. Mouth of the capsule small, with a red outer fringe, whose teeth are lined, as it were, with the sixteen opposite teeth of the inner one.

Seçt. 2. *Fruit-stalks rising above the stem*.

3. *B. pomiformis*. Apple *Bartramia*. Hedw. Sp. Musc. 164. Fl. Brit. n. 2. Engl. Bot. t. 998. Hook. and Tayl. n. 1. t. 23. Hook. in Curt. Lond. ed. 2. t. . . . (Bryum pomiforme; Linn. Sp. Pl. 1580. B. capillaceum, capsulis sphaericis; Dill. Musc. 339. t. 44. f. 1.)—Fruit-stalks erect, taller than the stem. Leaves awl-shaped, single-ribbed; somewhat twisted when dry.—Common on heaths and dry banks, in various parts of Europe, bearing capsules in the spring. An elegant moss, consisting of densely leafy stems from

BARTRAMIA.

from one to three inches in height, clothed and matted together below with copious brown fibres. *Leaves* bright green, slender, gradually tapering from their base; strongly ferrated towards the point; somewhat twisted and curved by drying. *Fruit-stalks* near the tops of the stems, about an inch long, bright orange-red, slightly wavy. *Capsule* globose, green and smooth while young; more elliptical when ripe, oblique, brown, with sixteen furrows. *Lid* rather convex, bossed. *Fringe* short, red. *Veil* conical, curved, split half way up on one side.

4. *B. crispa*. Frizzled Bartramia. Swartz Mufc. Svec. 73. Turn. in Ann. of Bot. v. 1. 527. Winch Guide v. 2. 16. "Bridel. Mufc. v. 2. 3. t. 1. f. 4. Schwægr. Suppl. t. 59." Sm. Compend. n. 3. Engl. Bot. t. 1526. (*B. pomiformis* β; Turn. in Ann. of Bot. v. 1. 527. Hook. and Tayl. n. 1. β.)—*Fruit-stalks* erect. *Leaves* brittle-shaped; dilated at the base; incurved and curled when dry. *Lid* slightly conical.—Native of mountainous situations in Britain, and other parts of Europe. Larger in its *stems* and *foliage* than the preceding, the *leaves* of a lighter brighter green, longer, and more slender, except at the very base, and when dry so strongly curled, twisted, and involute, as to give the plant a very different aspect. The intelligent authors of the *Muscologia Britannica* nevertheless judge this to be but a variety of the *pomiformis*, and they unite it with Mr. Turner's supposed variety of that species, which he distinguished from *crispa*, and which he has thought to be figured for *crispa*, in Engl. Bot. t. 1526. We acknowledge that figure to be not a very happy one, except the *lid*, which seems to us always rather more conical than in *pomiformis*.

5. *B. ibiphylla*. Straight-leaved Bartramia. Bridel. Mufc. v. 4. 132. t. 1. f. 6. Sm. Compend. n. 4. Engl. Bot. t. 1710. Winch Guide v. 2. 17. Hook. and Tayl. n. 2. t. 23.—*Fruit-stalks* elongated, erect. *Leaves* capillary, nearly entire, single-ribbed half way up; dilated at the base; straight when dry.—Found on dry banks, in the mountainous parts of Germany, Sweden, England, and Wales. The long, very slender, light-green *leaves* are only ferrated at the very point, and are remarkable for remaining always straight when dry, which Mr. Hooker has well attributed to the whole substance of the mid-rib being dilated and lost in the upper half of the leaf, to which it consequently gives firmness. The *capsules* are much curved; their *stalks* longer than in the foregoing. The dilated base of each *leaf* is singularly membranous and shining.

6. *B. gracilis*. Tall Slender Bartramia. Flörke in Schrad. Journ. v. 2. 171. Fl. Brit. n. 3. Engl. Bot. t. 1826. Hook. and Tayl. n. 3. (*B. Oederi*; Schwægr. Suppl. t. 59, as also, according to Mr. Hooker, *B. grandiflora*, t. 58. Bryum Oederi; Retz. Prodr. 261. Fl. Dan. t. 478.)—*Fruit-stalks* from lateral branches, taller than the stems. *Leaves* lanceolate, ferrated towards the point; recurved and twisted when dry.—Native of the loftiest Scottish mountains, as well as of the north of Europe. The *stems* are two or three inches high. *Leaves* broader than in any of the three preceding species, somewhat revolute at the margin, especially when dry, in which state they become recurved, and not curled inwards. Their colour is a darkish grass-green. *Capsules* small, from short lateral shoots.

7. *B. squarrosa*. Spreading-leaved Bartramia. Turn. in Ann. of Bot. v. 1. 528. t. 11. f. 2.—*Fruit-stalks* lateral, taller than the stems. *Leaves* awl-shaped, entire; single-ribbed at the base; spreading and straight when dry.—Received from Java by Mr. Dickson. Gathered by Commerçon, at the straits of Magellan. The tufted leafy

stems, shaggy with rusty fibres, and scarcely branched, are two or three inches high. *Leaves* slender, yellowish-green, longer than any of the preceding, except perhaps *B. Halleriana*, and always quite straight, probably from the same cause as in *ibiphylla*, the rib being soon lost in the substance of the leaf. *Fruit-stalks* straight, erect. *Capsule* curved, strongly furrowed. *Lid* convex, blunt.

8. *B. Menziesii*. Tall Forked Bartramia. Turn. ibid. 525. t. 11. f. 1.—*Fruit-stalks* slightly elevated above the tall forked stems. *Leaves* lanceolate, single-ribbed, taper-pointed, entire; close-pressed when dry. *Capsule* nearly globular, with shallow furrows.—Gathered on the north-west coast of America, by Mr. Menzies. The tall slender *stems*, covered with close-pressed, tawny, shining *leaves*, half the length of the last, clearly distinguish this species. The *capsules* are scarcely curved, even when fully ripe, and their surface is wrinkled as well as finely furrowed.

9. *B. sphaerocarpa*. Globose Bartramia. Hedw. Crypt. v. 3. 93. t. 38 A. Turn. as above, 525. (Mnium sphaerocarpon; Swartz Prodr. 139, from the author.)—*Fruit-stalks* taller than the slender clustered branches. *Leaves* lanceolate-awl-shaped, close-pressed, finely ferrated.—Native of Jamaica. Swartz. The slender *stems* are determinately branched, as in the following, to which this species is very nearly allied, though smaller, with longer branches. In the *leaves*, though usually narrower, we scarcely find a permanent difference. Hedwig's figure erroneously omits the furrows of the *capsule*.

10. *B. marbachia*. Narrow-leaved Bog Bartramia. Web. and Mohr Ind. 5. Sm. Compend. n. 7. Engl. Bot. t. 2074. (*B. fontana* β; Hook. and Tayl. n. 4. Turn. Mufc. Hib. 107. t. 10. f. 1. Mnium marbachium; Hedw. Crypt. v. 2. 108. t. 39.)—*Fruit-stalks* elongated, much taller than the clustered branches. *Leaves* lanceolate, finely ferrated at the point, close-pressed.—Native of wet situations in Germany, the Highlands of Scotland, and the mountains of Nepal, for Mr. Hooker assures us his *B. fontana*, Tr. of Linn. Soc. v. 9. 317, is this plant. He is also of opinion that *B. marbachia* is merely a lanceolate-leaved variety of the following.

11. *B. fontana*. Broad-leaved Fountain Bartramia. Fl. Brit. n. 4. Turn. Mufc. Hib. 107. Hook. and Tayl. n. 4. t. 23. (Mnium fontanum; Linn. Sp. Pl. 1574. Hedw. Sp. Mufc. 195. Bryum fontanum; Engl. Bot. t. 390. *B. palustre*, *capis teretibus stellatis*, *capulis magnis subrotundis*; Dill. Mufc. 340. t. 44. f. 2.)—*Fruit-stalks* elongated, much taller than the clustered branches. *Leaves* ovate, finely ferrated at the point, close-pressed.—Native of spongy bogs throughout Europe, and perhaps in other parts of the world. It is one of our handomest and largest mosses, bearing capsules in spring and summer. The barren *flowers* form terminal leafy stems, on a separate plant from the *capsules*, whose stalks are two or three inches long, rising high above the tuft of leafy branches, which have overtopped the originally terminal situation of their *flowers*. *Capsule* brown, with a minute sharp beak to the lid. *Leaves* usually direct, broadly ovate, entire at the edges, the point only being ferrated. They appear at first light very different from the lanceolate narrow shape of the last, and still more from the curved taper-points of Mr. Hooker's *B. falcata*, Tr. of Linn. Soc. v. 9. 317. t. 27. f. 4, which he is disposed to reduce to the *fontana*, having found the latter in Switzerland with leaves as decidedly curved. We cannot dispute his accuracy of observation and judgment in this point; nor are we much disposed to question his further opinion, that Hedwig's *sphaerocarpa*, our n. 9, as well as

scabrula Mublenbergii, (of which we have specimens from its finder,) and *radialis* of Schwazgrichen's Supplement, may possibly be likewise varieties of *B. fontana*.

BARYTES, in *Chemistry*, one of the earthy substances termed *alkaline*. We stated that this earth was considered by Bergman, Lavoisier, and other eminent chemists, as a refractory metallic oxyd; and this supposition has been since confirmed by the experiments of Berzelius and Pontin, who, led by sir H. Davy's decomposition of potash and soda by galvanism, subjected this earth to the same agent. Their experiments were attended with complete success, and have been since verified by sir H. Davy and other chemists. To this metallic basis, Davy gave the name of *barium*. More lately, Dr. Clarke of Cambridge thought he had decomposed this earth by exposing it to an intense heat, produced by the combustion of a stream of oxygen and hydrogen gas, mixed together in the requisite proportions to form water. To the metal thus obtained, he proposed to give the name of *plutonium*. Many chemists, however, think, that Dr. Clarke from some cause or other permitted himself to be deceived in these experiments, and that instead of a metal he only obtained a slag with a pseudo-metallic surface.

Barium obtained by galvanic agency is a solid metal of the colour of silver. It melts at a temperature below redness, and is not volatilized by a heat capable of melting plate-glass; but at that temperature it acts violently on the glass, probably by decomposing the alkali of the glass, and converting it into a protoxyd. When exposed to the air, it rapidly tarnishes, absorbs oxygen, and is converted into barytes. It sinks readily in water, and seems to be at least four or five times heavier than that fluid. It decomposes water very rapidly. Hydrogen is emitted, and the barium is converted into barytes. Barium seems to be both ductile and malleable.

Barium, according to the experiments of Gay Lussac and Thenard, combines with two proportions of oxygen. The protoxyd is the earth called *barytes*. No direct experiments have been made to ascertain the proportion of oxygen it contains; but this may be determined by other means. Thus, sulphate of barytes is composed of

Sulphuric acid	-	-	-	100
Barytes	-	-	-	194

and carbonate of barytes of

Carbonic acid	-	-	-	100
Barytes	-	-	-	354.54

Hence it may be easily ascertained by calculation, that the equivalent number for barytes is 97.5, oxygen being 10; and if we consider this earth as a protoxyd, the number for barium will of course be 97.5 - 10 = 87.5. Hence one hundred parts of barytes consist of

Barium	-	-	-	89.74
Oxygen	-	-	-	10.26
				<hr/>
				100.00

Gay Lussac and Thenard found, that when dry barium, from nitrate of barytes, or from the carbonate of barytes decomposed by charcoal, was heated in oxygen gas, it absorbed that gas with great rapidity. The peroxyd formed was grey. It gave out its excess of oxygen, when

put into water. When heated in hydrogen gas, the hydrogen was absorbed, and water was formed, which remained united to the barytes.

The salts of barytes are described under **SALTS**. The equivalent numbers of these, however, require a little correction; for which purpose, we refer our readers to the article *ATOMIC THEORY*, where the latest determinations will be found.

The muriate of *barytes* (see **SALTS**) has been employed as a medicine in scrofulous and cancerous cases. Although it has been accounted highly poisonous, Dr. Johnstone, in his "Essay on Poisons," says, that he has seen a female take 30 drops of a saturated solution of muriate of barytes repeatedly in the course of a day, without even nausea: and he concludes, that it would require at least two or three drachms to do mischief. Barytes is capable of making a very tenacious cement, but it has been yet much used in the arts, except by limners, as a most excellent water-colour. Mr. Hume, says Mr. Parkes (Chem. Catch.), many years ago discovered the method of making a colour from this earth. It is the only *subtle* for water-painting that never changes. It has another peculiar advantage, that it may be mixed with any other colour without injury. It is sold under the name of "Hume's permanent White." See **WHITE**.

BARYTES, *Carbonate of*. See **CARBONATE OF BARYTES**.

BASALT, in *Mineralogy and Geology*, a compact dark-coloured rock, classed by geologists with trap-rocks. (See **TRAP**.) It has received the name of *whin-stone* in the north of England (see **WHIN-STONE**); and in Staffordshire, Rowley-rag (see **ROWLEY-RAG**). In the arrangement of rocks by the Wernerian geologists, basalt is considered as a compact green-stone, which latter rock is composed of feldspar and hornblende; but green-stone being more crystalline, the constituent parts are distinctly separated. Green-stone and basalt often pass into each other. (See **GREEN-STONE**, *Addenda*.) Basalt has generally been classed with simple minerals; and a short account of its characters and constituent parts are given under the article **BASALT** (which see). More correct analyses of this rock have since been made, in which soda is found to be a constituent part. We greatly doubt the propriety of classing basalt with simple minerals; for it has been ascertained, that most basaltic rocks are composed of two or more minerals intimately mixed, but requiring the aid of a lens to distinguish them. Of these, the mineral called *augit* is the one which prevails, or forms the dark colour: it is intermixed with feldspar and olivine. It is thus ascertained that basalt resembles in its constituent parts, as it does in other characters, dark compact lava. (See **VOLCANIC PRODUCTS**.) Before the observations of the French mineralogist Cordier, both basalt and compact dark lava were supposed to be formed of hornblende and feldspar.

Before the blow-pipe, basalt melts easily, without addition, into an opaque black-coloured glass. It melts at a comparative low degree of temperature from 38° to 45° of Wedgwood. If it be cooled rapidly, the mass is vitrified; if cooled slowly, it is stony, and presents a tendency to a columnar arrangement. Some interesting experiments of this kind are described under the article **ROWLEY-RAG** (which see).

The constituent parts of basalt, as given by Klaproth and Dr. Kennedy, are as follow:

Basalt

BASALT.

	Basalt of the Haffenberg.	Basalt of Staffa.
Silex	44.50	48.0
Alumine	16.75	16.0
Lime	9.50	9.0
Magnesia	2.25	-
Soda	2.60	4.0
Oxyd of iron	20.0	16.0
Oxyd of manganese	0.12	-
Muriatic acid	-	1.0
Water and volatile matter	2	4
Klaproth	97.72	Kennedy 98

Basalt exists abundantly in the northern parts of England and in Scotland. It occurs at the Clee Hills in Shropshire, and at Rowley in Staffordshire; but is not met with in the southern counties of England. Some rocks of the trap or basaltic formation occur in Gloucestershire and Somersetshire. Basalt forms the well-known columnar ranges at the Giant's Causeway in the county of Antrim, and at Staffa. See *GIANT'S CAUSEWAY* and *STAFFA*.

The origin of basaltic rocks has excited much attention among geologists. Their similarity to volcanic rocks in composition and structure, the remarkable positions in which they occur, and the changes they frequently produce on the rocks in their vicinity, have led most intelligent and unprejudiced observers to the conclusion, that a great number, if not all, basaltic rocks have been formed by igneous fusion. The mineral veins filled with basalt, that intersect other rocks, frequently produce all the changes which a fluid mass of heated lava would have effected. (See *VEINS, Mineral*, and *TRAP*.) In the latter article, the arguments which have been offered against the igneous origin of basalt are also stated. For further remarks on the subject, see *Systems of GEOLOGY*. But the most striking phenomena, and which seem to decide the question, are presented in the districts called Velay and Viverrais, in the south of France. These districts have all the appearance of having been once the seats of active volcanoes, the remains of which are distinctly visible: from some of these ancient volcanoes, the lava may be traced to the crater, and this lava is a compact columnar basalt. See *Plate II. Mineralogy, Basalt*.

The mountain of Aifa, called La Coupe, or the Col d'Aifa, of which a view is given, is situated near the village Entrague, in the Viverrais. This village, according to St. Fond, is placed on a kind of platform of volcanic matter above the torrent of the Volant, which has here excavated a bed of great depth and width, bordered on the right and left by grand ranges of basaltic columns. In the midst of a prodigious rampart of these columns, at different levels, may be seen a current of lava descending from a neighbouring mountain, and joining the columns that border the river. Here we see, in the most unequivocal and convincing manner, that the lava under the form of hard and compact basalt, has flowed at several times from the mountain, and has formed the great causeway at different heights, to which the lava is still united and adhering. We may follow the current of basalt up the declivity of the mountain, which has a conical form and a great elevation, and is entirely volcanic from the base to the summit. According to St. Fond, it is the most remarkable and best characterized crater in all the Viverrais.

All the base of the conical mountain La Coupe is covered by porous and cellular lava in detached irregular masses, heaped on each other, so as to leave no doubt that they have been ejected in a liquid state by one or more formidable

eruptions, and have taken their forms as they fell at the foot of the cone.

On reaching the summit or edge of the crater we may see the whole mountain, which forms a regular cone resembling that of Vesuvius. The edges of the crater are steep, and formed in the shape of a tunnel; the greatest diameter being from 140 to 150 toises, and the depth about 600 feet. The lavas are coloured, and converted into a kind of puzzolani, and mixed with great masses of black and sharp scoria, which makes the descent difficult. At the bottom of this inverted cone is a magnificent plantation of chestnut-trees, which have flourished astonishingly in this ancient mouth of a volcano, having no other soil than the dry and friable puzzolani. It may be noticed, that the crater of Vesuvius was lined with lofty trees at the period of its eruption in 1631, having been in a state of repose for nearly four hundred years.

At the bottom of the crater in La Coupe, we may observe a breach or opening on the side facing the houses of the Colet d'Aifa; there is a general inclination to this opening, which has served to give a passage to the lava. When we are arrived at the opening, we may observe a stream of lava coming from the interior, and taking its course down the mountain, it descends in a waving direction amidst the porous lavas. This current is a true black basalt, compact and similar to that of the columns; in certain parts, its surface appears blistered, and in other places is become porous. Following the current of lava, after it has crossed the path, which is at the foot of the mountain, we may trace its course to the bed of a torrent not far from the high road. There may be seen, says St. Fond, a spectacle most gratifying to the geologist; for the lava, whilst still on the descent, and before it had reached the level ground, has formed a prismatic form; and the lava at the bottom has affected a beautiful colonnade.

We cannot doubt, says St. Fond, after viewing this mountain, that the lava which flows from volcanic craters is not absolutely the same as basalt. The name of La Coupe is evidently derived from the crater, the Latin name for a cup.

There is another conical mountain in the Viverrais with a distinct crater, called La Coupe de Jaujeac. The general resemblance of the latter is so similar to that of La Colet d'Aifa, that it may well be conceived from the view given of the latter. (See *Plate II. Mineralogy*.) It is rather less lofty, but the crater is nearly twice as large. The river Vignon flows at the foot of Jaujeac. On its banks are immense ranges of basaltic columns, the most elevated of any in the Viverrais. They inclose the borders of the river on each side for more than a league.

Some of the prisms rise in one shaft to the height of fifty feet; in other parts, the articulated columns form a kind of regular causeway. In some places the columns are bent, and above we see immense ramparts of basalt, of more than 140 feet in height, in several ranges, spreading out like a fan, and diverging in every direction. On the left, the current of basalt covers several little hills of granite, and is moulded upon them. In some parts, the compact lava forms one solid mass; in other places, it is arranged in great beds. Nothing can be more grand and varied, says St. Fond, than the course of the river Vignon to Ardeche, where the great current of lava joins the streams that have flowed from the volcanoes of Theuys and Neyrac. Faujas St. Fond sur les Volcans eteints du Viverrais et du Velay.

Plate II. Mineralogy, Basalt, which is taken for this work, will convey at once a satisfactory proof of the igneous origin of the basaltic columns in the Viverrais; but one engraver

has omitted to represent the division of the upper part of the bed into columns. The ends of the columns may be distinctly seen before the basalt reaches the river.

BASALTIC HORNBLEND. See MINERALOGY, *Adenda*.

BASMAN, in *Geography*, an island of the Persian gulf, situated $11\frac{1}{2}$ leagues N.N.W. from Shorga, in N. lat. $25^{\circ} 54'$. It is an uninhabited island, about five miles long, and remarkable for a high round hill in its centre.

BASSORA, col. 1, l. 1, from the bottom, after 1668, add—subject to various revolutions. L. 11, after *Porte*, insert—The musketeer, or governor, has ever since the year 1787, when it was recovered from the Monte-ridge Arabs, by Solyman Pacha, been sent from Bagdad, and is generally an officer of high rank. Full liberty is allowed, &c. Col. 2, l. 12, after 50,000, add—or 60,000, consoling of persons of almost every nation in the East. L. 29, N. lat. $31^{\circ} 30'$. E. long. $48^{\circ} 39'$.

BAT-Horses, in *Artillery*, are baggage-horses belonging to the officers when on actual duty; and *bat-men* were originally servants hired in time of war to take care of the horses belonging to the train of artillery, baggage, &c., and who, during their service, generally wear the king's livery. Those who are excused regimental duty, for the specific purpose of attending to the horses belonging to their officers, are called bat-men. Horses and men of the preceding description are sometimes called *bow-horses* and *bow-men*.

BATARREA, in *Botany*, so named by Pursh, in honour of his learned predecessor in the study of the *Fungus* tribe, Antonio Battarra, professor of philosophy in the Lyceum at Rimini, author of *Historia Fungorum Agri Ariminensis*, published at the neighbouring city of Faenza, in 1759, in 4to., with 40 plates. A preceding edition is indicated in the title-page, which Haller dates 1755. The author was a disciple of Janus Plancus, or Giovanni Bianchi, the conchologist, and died in 1789, according to Dryander in *Bibl. Bankf.* He was, however, an original observer, and delineated the figures himself.—*Perf.* Syn. Fung. 129.—*Clas* and order, *Cryptogamia Fungi*. Nat. Ord. *Fungi*.

Ess. Ch. Stalk bursting from a wrapper, and elevating the bell-shaped, downy, powdery head, capped with a portion thereof.

1. *B. phalloides*. Tall Brown Batarrea. *Perf.* n. 1. t. 3. f. 1. (*Lycoperdon phalloides*; *Dickf. Crypt. fasc.* 1. 24. Woodward in *Phil. Trans.* v. 74 423. t. 16. *Sm. Spicil.* 11. t. 12. Sowerb. *Fung.* t. 390.)—Found on sandy banks about Norwich, by Mr. William Humphrey, and about Bungay in Suffolk, by T. J. Woodward, *esq.* We have reason to think it may be met with in other parts of England, as Mr. Hudson, author of the *Fl. Angl.*, told the writer of the present article, he had seen this singular production on heaths in Kent, but passed it by as a blasted or abortive *Agaricus Procruus*. We have not heard of this very curious fungus in any other part of the world. The *volva*, or wrapper, is about the shape and size of a hen's egg, originally of three slightly coriaceous layers, hollow internally, where a spongy stalk is formed, which rises very suddenly (in a few hours) to its full height of about twelve inches. This stalk is hollow, soon becoming dry, and externally filamentous, and carries up, on its summit, full half the innermost layer of the *volva*, which is white and smooth within, covered externally with copious brown powdery seeds, intermixed with fibres, as in a *Lycoperdon*. A smaller portion of the two outer layers, irregularly torn away, forms a double cap to this powdery fungus.

BATAVIA, in *Geography*, a post-township of New

York, the capital of Genesee county, 256 miles from Albany, on the great road to Buffalo; about 50 miles long from N. to S., and from 24 to 28 miles wide; bounded N. by lake Ontario, E. by Murray and Caledonia, S. by Warlaw, Attica, and Sheldon, and W. by Niagara county. The whole population of this town, in 1810, was 3645, with 104 senatorial electors, and 464,216 dollars of taxable property.

BATH. Add—The city of Bath, by the return of 1811, contained 3933 inhabited houses, and 31,496 persons; viz. 12,373 males, and 19,123 females.

BATH, a county of Virginia, &c. add—The total number of inhabitants, in 1810, was 4837, including 882 slaves.

BATH, a township, &c. l. 2, for 949 r. 2491.

BATH, in Grafton county, &c. l. 2, for 493 r. 1316.

BATH, a post-township, the capital of Steuben county, 245 miles W. of Albany. The whole population, in 1810, was 1036, with 97 electors.

BATH, a township of the district of Ohio, in the county of Greene, having 913 inhabitants.

BATSCHIA, in *Botany*, was so named by professor Gmelin, the compiler of the 13th edition of the whole *Systema Naturæ* of Linnæus, in honour of professor Batfch of Jena, known particularly by his *Elenchus Fungorum*, published at Halle in 1783 and 1784, in 4to., with coloured plates, and his *Analyse Florum*, a work of a similar description, which appeared in 1790. Gmelin however adopted this genus, like many others, entirely from the *Flora Carolinaana* of Mr. Thomas Walter, who had modestly left such genera without names, because, though he supposed them to be new, he had not the advantage of books, or other helps, to confirm his opinion. In the present instance we apprehend his *Anonymos*, n. 78. *Fl. Carol.* 91, cannot be supported, but we shall give its character and synonymy.—*Gmel.* Linn. Syst. Nat. v. 2. 315. Michaux *Boreal.* Amer. v. 1. 129. Pursh 132.—*Clas* and order, *Pentandria Monogynia*. Nat. Ord. *Aperisfolia*, Linn. *Borraginea*, Juff.

Gen. Ch. Cal. Perianth in five deep, linear, acute, erect segments. Cor. of one petal, valver-shaped; tube straight, longer than the calyx, surrounded at the base, internally, with a ring of hairs; throat pervious; limb orbicular, in five deep rounded segments. *Stam.* Filaments five, very short, inserted into the tube; anthers erect, ovate, concealed within the tube. *Pist.* Germen superior, roundish, with four prominences; style capillary, the length of the stamens; stigma minute, slightly cloven. *Peric.* none. *Seeds* four, ovate, hard, polished.

Ess. Ch. Corolla valver-shaped; throat naked; tube with a hairy internal ring at the base; segments of the limb rounded. Calyx in five deep segments.

Obf. It appears to us that this genus cannot be kept separate from *LITHOSPERMUM*. (See that article.) The only mark of distinction is the hairy ring in the bottom of the tube, which surely is not sufficient. The form of the corolla is as much funnel-shaped as in that genus, and the seeds are acknowledged to be precisely the same. Michaux asks, (perhaps on account of the yellow flowers,) "whether *L. orientale* of Linnæus be not a *Batfchia*?" We find no traces there of the hairy ring, nor was any such character detected by Mr. Bauer, when he made the drawing for Dr. Sibthorp's *Fl. Græca*, t. 160. This circumstance does away the presumption of a generic difference here indicated by colour. The following are the only reputed species of *Batfchia*.

1. *B. Gmelini*. Hairy Puccoon. Michaux n. 1. Pursh n. 1. (*Anonymos carolinensis*; Walt. *Carol.* 91.)—Hairy. Floral

Floral leaves ovate. Calyx elongated, somewhat lanceolate. —In dry sunny woods of Lower Carolina. Perennial, flowering from May to July. Seen in Mr. Lyon's herbarium. *Pursh.* Flowers bright yellow, on short footstalks. *Walter.*

2. *B. canescens.* True Puccoon. Mich. n. 2. t. 14. *Pursh* n. 2. (*Anchusa hirta*; *Muhlent.* Cat. 19. *A. virginiana*; *Linn. Sp. Pl.* 191. *A. floribus sparibus, caule glabro*; *Gron. Virg. ed. 2. 24.* *Lithospermum virginianum*, flore luteo duplici; *Morif. sect. 11. t. 28. f. 4.*)—Downy and hoary. Leaves all oblong. Calyx very short. Segments of the corolla entire.—On dry sunny hills on a sandy soil, in Virginia, Tennessee, &c. perennial, flowering in June and July. Flowers of a deep golden-yellow. The root is covered with a red substance, which is the true Puccoon of the Indians, and paints a beautiful red. *Pursh.* With this colour, it seems, the native Americans painted their bodies. The whole herb is clothed with soft hairs, nor is the stem, as *Linnaeus* says, smooth. He had no specimen of this plant, when he wrote either edition of *Sp. Pl.*, but afterwards confounded herewith a totally different Siberian plant, which lies under this name in his herbarium, but without the requisite marks of authenticity. *Morison's* figure represents a double-flowered variety, which is very unfruitful in this natural order.

3. *B. longiflora.* Long-flowered Puccoon. *Pursh* n. 3. —“Downy and silky. Leaves linear. Calyx long and linear. Segments of the corolla notched; tube elongated.” —Found by *Mr. Nuttall*, on the banks of the *Missouri*. Perennial, flowering in July. Flowers yellow. *Pursh.*

We should presume that all these species belong rather to *Lithospermum* than to *Anchusa*, but we have only seen the second, communicated in a dried state, from *Pennsylvania*, by the late *Rev. Dr. Muhlenberg*.

BATTAM, the *Babia* of *Strabo*, in *Geography*, a town of *Armenia*, in the pachalic of *Erzeroom*, on the *Euxine*. This is a commercial place; and between it and *Akliska* are the towns of *Ichochischeloe*, *Gartziemie*, *Schwaghaewal*, and *Kaettaejac*.

VOL. IV.

BATTING. See COTTON, and MANUFACTURE of Cotton.

BATTLE, l. ult. r. and in 1811 had 361 houses, and 2531 persons; 1232 being males, and 1299 females.

BATTLE, Order of. Col. 6, l. 19, to l. 41, dele.

BATZ. Add—The florin at *Augsburg* is divided into 15 batzes, (or batzen), or 20 *kayfergrochen*. A thaler, or six-dollar, is worth $1\frac{1}{2}$ florin, $22\frac{1}{2}$ batzes, or 90 creutzers. At *Basil*, the thaler, or six-dollar, is worth 3 livres, 27 good batzes, or 30 Swiss batzes; the florin, 15 good batzes, or $16\frac{2}{3}$ Swiss batzes; the livre, 9 good batzes, or 10 Swiss ditto. A good batze is 4 creutzers; a Swiss batze, 2 fous, or $3\frac{2}{3}$ creutzers. At *Bern*, accounts are kept in livres of 20 fous, the fou of 12 deniers; also in livres, or francs, of 10 batzes, or 40 creutzers; and in crowns of 25 batzes, or 100 creutzers. A six-dollar, or ecu blanc, is worth 30 batzes; a crown, 25 batzes; a florin, 15 batzes; a livre, or franc, 10 batzes; a pfund, $7\frac{1}{2}$ batzes, or 15 fous; a batze, 2 fous, or 4 creutzers.

BAUERA, in *Botany*, received its name, not from *Joseph Banks*, as *Mr. Andrews*, by mistake, has recorded, but from the author of the present article; in due commemoration of those excellent botanical artists, and practical observers, *Mr. Francis Bauer*, so long employed as a draughtsman at *Kew*, and his brother *Mr. Ferdinand Bauer*,

who after being engaged in the same occupation by *Dr. Sibthorp* in *Greece*, accompanied *Mr. Brown* to *New Holland*, and is now returned to *Germany*, having left behind him in *England* unrivalled monuments of his abilities.—*Andr. Repof. t. 198.* *Ait. Hort. Kew. v. 3. 317.* *Salisb.* in *Ann. of Bot. v. 1. 514. t. 10.*—Clas and order, *Polyandria Dignity.* *Nat. Ord. Saxifrage Juff.* *Salisb. Cuno-niaceae.* *Brown.* Bot. of *Terra Austr. 16.*

Gen. Ch. Cal. Perianth inferior, of one leaf, in eight deep, lanceolate, reflexed, permanent segments. Cor. Petals eight, obovate, equal, concave, alternate with the calyx, and nearly twice as long. Stam. Filaments numerous, thread-shaped, inserted into the receptacle, half as long as the petals; anthers erect, obovate, of two cells, burbling at the summit. Pist. Germen superior, somewhat pyramidal, obtuse; styles two, thread-shaped, longer than the stamens, recurved; stigmas simple, obtuse. Peric. Capsule roundish, tumid, somewhat compressed, with two short, divaricated, pointed lobes, of two cells and two valves, burbling at the top, between the points; partition contrary to the valves. Seeds numerous, oval, corrugated, inserted into the central column.

Ess. Ch. Calyx inferior, in eight permanent segments. Petals eight. Capsule inflated, of two cells, with many seeds.

1. *B. rubrifolia.* Madder-leaved *Bauera*. *Salisb.* as above. *Ait. n. 1.* (*B. rubroides*; *Andr. Repof. t. 198.* *Curt. Mag. t. 715.* *Venten. Malmalf. t. 96.*)—Native of *New South Wales*. First discovered in that country by *Mr. Joseph Banks*. We received specimens and seeds from *Dr. White*, among the first communications from the settlement there, and this beautiful shrub was raised by the late *Marchioness of Rockingham*, at *Hillingdon*, in 1793. It requires the shelter of a green-house, or conservatory, and flowers during most part of the summer and autumn. The stem is five or six feet high, much branched, woody, but slender and weak; the branches opposite, round, leafy, somewhat hairy. Leaves opposite, or sometimes three together, ternate, nearly sessile, evergreen, widely spreading; leaflets three-quarters of an inch long, lanceolate, distantly serrated, their ribs a little hairy beneath; their upper surface convex, of a deep shining green; under paler. Flowers axillary, on simple hairy stalks, longer than the leaves, a little drooping, scarcely an inch broad, of a beautiful rich rose-colour, with yellow anthers, inodorous. The parts of the flower vary occasionally in number, from seven to nine or ten. The branches, like the leaves, are sometimes three together, and when young, have, like them, a reddish tinge, which the permanent calyx, and old leaves, likewise assume. We do not very clearly perceive the resemblance to *Madder* in the leaves, and should have been glad if the specific name originally proposed, *formosa*, had been retained for a plant which so well deserves that appellation.

Another species is mentioned, by the name of *B. humilis*; in *Ait. Epit. 364*, as introduced at *Kew*, from *New Holland* in 1805, and flowering in June and July. But not a word is said respecting the specific differences between the two.

BAYAZID, in *Geography*, one of the Turkish pachalics of *Armenia*: the city of this name lies at the distance of two days' journey from *Erwan*, nine from *Erzeroom*, and four from *Khoi*, and occupies the declivity of a mountain, the summit of which is strongly fortified. The city is surrounded with walls and ramparts: it has two churches and three mosques; and the monastery of *Karu Killesea* is famous for the beauty of its architecture, its antiquity, and its grandeur. The inhabitants are reported to amount to
about

about 30,000, and are esteemed the most learned and warlike people in Armenia. The climate is mild, and the city, with the extensive territory attached to it, is under the government of a pacha of two tails, archbishop of Merdin. McKinnier's Persia.

BAYLA, the capital of Lus, a district of the Persian empire, in the province of Mekran, and country of the ancient Oritze, is built on the N.E. bank of the river Pooralee, and contains 1500 houses, and 6000 inhabitants, of whom 400 are Hindoos. The present chief can bring into the field 4000 irregular troops, and enjoys a revenue of 50,000 rupees per annum.

BAYOU, a term originally Spanish, signifies the diminutive of bay; but in Louisiana, where it frequently occurs, it is synonymous with the word *creek*, and consequently becomes the diminutive of river.

BEAN-GOOSE. See **ANAS** and **DUCK**.

BEATTIE, JAMES, &c. l. 2, born Nov. 5; l. 12, latter, by the liberality of a mother, (his father having died when he was seven years of age,) by, &c.; l. 18, *dele* at Alloa; and l. 19, *dele* assistant to the; l. 24, for 1760 r. 1761; l. 41, insert—which was written about the year 1764, though not published till some time after. Col. 2, l. 35, *dele* following; l. 62, for not long afterwards r. in 1770; l. 65, for 1777 r. 1776, (in consequence of which he obtained the pension above-mentioned.) Col. 3, l. 23, insert—In 1790 he published a summary of his lectures under the title of "Elements of Moral Science;" the first volume of which contains a very accurate enumeration and arrangement of the perceptive faculties and active powers of man. He has also given a cursory view of what is called natural theology. The second volume, published in 1793, comprehends much miscellaneous information on ethics, economics, politics, and logic, including rhetoric. Towards the latter part of his life, his time, &c.

BEAUCAIRE, l. 7, *dele* The part of the Rhine is well constructed.

BEAVER, in *Geography*, a county of Pennsylvania, containing 12,168 inhabitants, in which are several townships of the same name; such as *North Beaver* with 932, *Big Beaver* with 702, *Little Beaver* with 1379, *Beaver Borough* with 426, and *South Beaver* with 1351 inhabitants.—Also, a township of Pennsylvania, in Northumberland county, having 502 inhabitants.—Also, a township of Crawford county, with 236 inhabitants.—Also, a township of Columbiana county, in the district of Ohio, having 433 inhabitants.—Also, a township of the same district, in Greene county, having 793 inhabitants.

BEAVER CREEK, a township of Pennsylvania, in Beaver county, with 774 inhabitants.

BEAVER KILL, a township of the district of Maine, in the county of Kennebeck, containing 354 inhabitants.

BEAUFORT, in South Carolina, l. 4, r. 25, 887, including 20,914 slaves.

BEAUFORT, (col. 2, after l. 14,) a county of North Carolina, containing 7204 inhabitants, of whom 2,568, are slaves.

BEAUFORTIA, in *Botany*, a truly noble genus, consecrated, by Mr. Brown, to the memory of Mary duchess of Beaufort, who died January 7th, 1714, in the 85th year of her age. Her grace cultivated a number of rare plants in the stoves and green-houses at Badminton, Gloucestershire, during the life-time of her husband, Henry, first duke of Beaufort, whose death happened in 1699. The plants introduced by her always therefore bear this date in Mr. Aiton's *Hortus Kewensis*. Numerous specimens from the Badminton garden were communicated to sir Hans Sloane, and if we

are not mistaken, a splendid herbarium in the British Museum, bound in several large folio volumes, bears the title of "The Duchesse of Beaufort's Plants."—Brown in Ait. Hort. Kew. v. 4. 418.—Clafs and order, *Polyadelphia Icosandra*. Nat. Ord. *Heperideae*, Linn. *Myrti*, Juss.

Gen. Ch. *Cal.* Perianth half superior, of one leaf, turbinate; limb in five deep, awl-shaped, deciduous segments. *Cor.* Petals five, elliptical, sessile, inserted into the rim of the calyx, between its segments, and of equal length. *Stam.* Filaments very numerous, in five sets, inserted into the calyx, opposite to the petals, the claw of each set linear, hairy at the base internally, much longer than the petals, divided at the top into seven, eight, or more, capillary spreading segments about a quarter the length of the claw; anthers terminal, inserted by the base, of two divaricated, conical, deciduous, single-celled lobes. *Pist.* Germen in the bottom of the calyx, small, roundish, hairy at the summit; style thread-shaped, shorter than the stamens, variously bent upwards and downwards; stigma acute. *Peric.* Capsule coated with the base of the calyx, and firmly united to the branch, roundish, of three cells. *Seeds* solitary.

Ess. Ch. *Calyx* in five segments. *Petals* five. *Stamens* numerous, very long, in five sets, opposite to the petals; anthers of two deciduous lobes. *Capsule* clothed with the base of the calyx, three-celled, permanent. *Seeds* solitary.

Obs. Many of the flowers are said to want the *style*. We are not clear, from the account of the author of this genus, whether more than one *seed* is perfected in each *fruit*. The *capsules* remain in masses furrounding the branches, long after the *seeds* are gone, perhaps for several years, being firmly united to the bark or wood; a character common to many of this natural order in New Holland, as MELALEUCA, (see that article,) and others. The very peculiar *anthers* seem to afford the most essential character of *Beaufortia*, and distinguish it from its near ally *CALOTHAMNUS*. See that article hereafter.

1. *B. decussata*. Splendid *Beaufortia*. Br. in Ait. n. 1. Sims in Curt. Mag. t. 1733.—Leaves opposite, ovate, many-ribbed, crossing each other in pairs. Claws of the stamens very long, their filaments radiating.—Gathered by Mr. Brown, on the fourth-west coast of New Holland, and sent to Kew by Mr. Good, in 1803. A green-house shrub, flowering in the spring, and increased by cuttings. The *branches* are angular. *Leaves* sessile, crowded, half or three-quarters of an inch long, recurved, smooth, rigid, entire, full of pellucid dots; paler beneath. *Flowers* in dense tufts, furrounding the branches here and there, most conspicuous for their copious spreading tufts of *stamens*, an inch and a quarter or more in length, all over of a rich scarlet, the *petals*, as well as calyx, being green.

2. *B. sparsa*. Alternate-leaved *Beaufortia*. Br. in Ait. n. 2.—Leaves scattered, elliptical, many-ribbed.—Gathered in the same country, by Mr. Brown, from whence it was likewise sent to Kew, by Mr. Good, in 1803, but does not appear to have flowered in 1812, when the fourth volume of Hort. Kew. was printed.

We presume Mr. Brown's *Prodromus*, when completed, will make us acquainted with more species of this genus.

BEAUMARIS, col. 2, l. 9, for 1275 r. 1295. Col. 3, l. 1, for 37 r. 57; l. 37, r. Lavan. Add—The borough of Beaumaris contained in 1811, 295 houses, and 1810 persons; 809 being males, and 1001 females.

BECCKET, in *Geography*, l. 2, for 751 r. 1028.

BEDDOES, THOMAS, M.D. in *Biography*, a distinguished physician and philosopher, was the son of an opulent tanner at Shiffall in Shropshire, and born in 1760. Indicating at an early age peculiar talents, and disposed to cultivate them by diligent

diligent application, he was destined for a learned profession. With this view, after the requisite previous education, he was entered, in the year 1776, at Pembroke college, Oxford, and in the progress of his studies acquired the reputation of a classical scholar; connecting with his other pursuits the study of the French, Italian, and German languages, as well as of pneumatics, chemistry, mineralogy, and botany. After having taken his first degree of arts, he repaired to London, where he prosecuted the study of anatomy and physiology, and published translations of Spallanzani's Disquisitions, of Bergman's Essay on Elective Attractions, and of Scheele's Chemical Essays. At Edinburgh, where at this time, he had commenced his studies, he obtained high reputation among his fellow-students. In 1786 he graduated M.D. at Oxford, and in the following year visited the continent. Upon his return, he was appointed to occupy the chemical chair at Oxford. At this period he formed an acquaintance with Dr. Darwin, which gradually ripened into the intimacy and confidence of friendship. In 1790 he presented to the public an analytical account of the writings of Mayow, well known for his early discoveries in the department of pneumatic chemistry. (See his article in the Cyclopædia.) And he also communicated several papers to the Royal Society. As a chemical professor at Oxford, he was a popular lecturer; and he was much respected in the university on account of the rank he occupied in general literature and science: but interesting himself in the party politics of that period, and avowing his opposition to systems which then prevailed with regard both to church and state, he found it expedient to resign his professorship in 1792. He was adverse, however, to that detestable spirit which blended itself in France with their struggles for liberty. Among other publications which issued from the press about this time, our limits will only allow the mention of his "Observations on the Nature of Demonstrative Evidence, with Reflections on Language," intended to facilitate the study of geometry to youthful minds, by shewing, in opposition to the doctrine of the author of *Hermes*, that geometry is founded in experiment, and that its elements may be rendered palpable to the senses. The most popular of his publications was a small work, which appeared under the title of the "History of Isaac Jenkins," a fictitious narrative, exhibiting the character of a labourer immersed in the evils of habitual drunkenness, but reformed to sobriety and industry; of which his biographer (*ubi infra*) says, that if the author had left no other monument of his ingenuity and benevolence, he would not have lived in vain. Without adverting to his other writings, we shall proceed to mention his pneumatic establishment in the vicinity of the Bristol hot-wells, undertaken and for some time liberally supported for the purpose of curing diseases by the judicious application of different kinds of factitious air. For the convenience of superintending this institution he resided at Clifton, and in 1794 formed a matrimonial connection with a lady of the justly celebrated Edgeworth family. From this time his medical publications became numerous, and as a physician his advice was in high estimation; and he was consulted by persons in distant parts, who are said to have derived great benefit from his prescriptions. Although his pneumatic institution failed with respect to the degree of success which he might augur, and proved of temporary duration, it served to bring into notice the present sir Humphry Davy, one of the most eminent philosophers of our time, whose talents, restricted in their exercise to a remote town in Cornwall, caused him to be engaged as its manager. In the year 1806, Dr. Beddoes was attacked with some affection of the liver, which, after subsiding for a time,

returned with a disease in the chest in 1808, and rapidly increasing terminated in his death on the 24th of December, before he had completed his 49th year. Although his manner, says his biographer, was cold and repulsive, he possessed kind and tender feelings; and in the relations of domestic and private life his conduct was unexceptionable. Stock's *Memoirs of the Life of Thomas Beddoes, M.D.*

BEDFORD, col. 3, l. 4, r. In 1811, the borough contained 940 houses, and 4605 persons; 2057 being males, and 2548 females.

BEDFORD, a township of America, &c. l. 2, for 898 r. 1296.

BEDFORD, in Middlesex county, &c. l. 2, for 523 r. 592.

BEDFORD, *New*, l. 2, for 3313 r. 5651.

BEDFORD, in New York, l. 2, for 2470 r. 2374, with 241 electors, in 1810. Add—Near the centre of this town is the village of Bedford, where the courts for the county are held one half of the time, and the other half at White Plains. Here are, a court-house and prison, a Presbyterian church, an academy, and a small number of houses.

BEDFORD, a county of Pennsylvania, l. 4, for 13,124, including 46 slaves, r. 15,746; subjoin after 1795—it contains 547 inhabitants.

BEDFORD, a township in the same county, includes 1352 inhabitants.

BEDFORD, a county of Virginia, &c. l. 5 and 6, for 10,531 r. 16,148, and for 2754 r. 6147.

BEDFORD, a county of West Tennessee, having 8242 inhabitants, including 1180 slaves.

BEDFORDSHIRE, col. 2, l. 8 and 9, r. The county, in 1811, contained 13,286 houses, and 70,213 persons; 33,171 being males, and 37,042 females: 9431 families employed in agriculture, and 4155 in trade and manufactures.

BEDLIS, or BETLIS, a large town, situated at the opening of the strongest of the passes in the road from Diarbekir to Van and Tabriz. The river of Bedlis (the Centrites of Xenophon) is conducted by Hajy Kalifa through the plain to the southward of Sahert, Sard or Sared (the ancient Tigranocerta). Betlis is one of the most ancient cities of that part of the kingdom called Kurdistan: the castle is on the top of a high mountain, which bounds the plain to the west: the inhabitants of the town and neighbouring villages amount to about 26,000 Kurds, Turks, Armenians, and Syrians. The Armenians, who enjoy a considerable portion of liberty, have four churches and four monasteries. The lands around Betlis are highly cultivated, and produce grain of several kinds, cotton, hemp, rice, olives, honey, truffles, and mushrooms. The neighbourhood abounds with game, and the mountains are infested by lions, wolves, and bears. In the vicinity are quarries of red and white marble. See BETLIS.

BEDMINSTER, a township of Bucks county, in Pennsylvania, having 1199 inhabitants.

BEDRI, a town of the Persian empire, in the pachalic of Bagdad, 13 leagues from Mendeli, and four from the foot of the mountains; is the frontier town, in this quarter, of the Turkish empire. It is surrounded with a number of fine gardens; but its districts are damp and marshy, interspersed with pools of water, the receptacles of the torrents, which, in the spring, are continually rushing from the mountains.

BEER, col. 2, l. 4, from the bottom, add—For the excise duty on beer, see ALE.

BEERING'S STRAITS, l. 7, after Cook, insert—He afterwards ascertained, that Cape Prince of Wales was the western extremity of the whole continent of America; and another cape was observed to the northward of this, lying

in lat. $67^{\circ} 45'$, and long. $194^{\circ} 51'$. To this cape, captain Cook gave the name of Point Mulgrave.

BEES'-Bread. See PAIN des Abeilles.

BEGA, a land measure in Bengal, equal to about the third part of an acre.

BEGARMEE, col. 2, l. 9, for matured *r.* weakened.

BEHABAN, in *Geography*, the capital of the mountainous district of Khogloca, in the province of Fars, in the Persian empire, which district extends from the valley of Ram Hormuz to the vicinity of Kazeroon. The town is pleasantly situated in the middle of an extensive valley, three miles E. of the ruins of the ancient city of Aragian, which may be seen on the banks of the river Jerahi. It is the residence of a beglerbeg, who has a palace in the N.E. corner of the town. The walls are about three miles in circumference, and the population is said to amount to nearly 10,000 souls. The plain of Behaban is of considerable extent, and highly cultivated. The rivers Tab and Jerahi flow through it, Behaban is 153 miles from Shiraz, separated from it by a mountainous country, almost wholly uninhabited, and infested by banditti.

BEHRING. See BEERING.

BELCHER, l. 2, for 1485 *r.* 2270.

BELENUS. See BEL-TEIN, and BELUS.

BELFAST, in America, l. 5 *r.* 1274. Add—Alfo, a township of Bedford county, in Pennsylvania, having 758 inhabitants.

BELGRADE, in America, l. 2, for Lincoln *r.* Kennebeck; add—It contains 996 inhabitants.

BELINUS. See BELUS.

BELL, col. 4, l. 40, *r.* 7th; l. 42, *r.* 610.

BELLS, *Electrical*, l. 4, *r.* Plate V. fig. 38.

BELLEFORTE, a township of Centre county, in Pennsylvania, having 303 inhabitants.

BELLENDENA, in *Botany*, is so called by Mr. Brown, in honour of John Bellenden Ker, esq., late Gawler, an ardent and scientific botanist, whose labours respecting the natural order of *Enfatae*, and the Liliaceous tribe, published chiefly in Curtis's Magazine, and often cited by us, richly entitle him to botanical commemoration.—Brown Tr. of Linn. Soc. v. 10. 166. Prodr. Nov. Holl. v. 1. 374.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Proteacea*, Juss.

Eff. Ch. Petals four, regular, spreading. Nectariferous glands none. Stamens inserted into the receptacle. Germen two-seeded. Stigma simple. Capsule without wings, not bursting. Seeds one or two.

1. *B. montana*. Mountain Bellendena.—The only species; found by Mr. Brown on the summits of mountains in the island of Van Diemen, but as yet unknown in our gardens. This is a perfectly smooth *shrub*. The leaves are scattered, flat; three-cleft at the extremity. Spikes terminal, racemose. Flowers scattered, rarely in pairs. Corolla white, soon falling. Germen connected by a joint with its stalk. Seed-vessel coloured, furrowed along one edge. Brown. The insertion of the stamens into the receptacle, and not into the petals, is an unique instance in this natural order.

BELLINGHAM, in America, l. 2, for 735 *r.* 766.

BELMONT, in *Geography*, a county of the district of Ohio, containing 11,097 inhabitants.

BELPRE, a township of Ohio, in the county of Washington, having 494 inhabitants.

BELVEDIER, a town of Vermont, in Franklin county, having 217 inhabitants.

BELY BOGUE. See BOGUE, BELY.

BEMINSTER, l. 32, *r.* the town and parish contain

445 houses, and 2290 persons; 1077 being males, and 1213 females.

BEMOL, l. 11, for F *r.* G; and for G *r.* B b.—l. 15, for Feyton *r.* Feytau.

BENDER-Abaffi. See GAMERON.

BENDER-Delem, or Bunder-Deelum. Add—This is a small town, containing about 700 inhabitants, who trade with the merchants of Bahrein and Buffora.

BENDER-Rigg, or Bunder-Reig, (the port of Sand,) a city of Persia, in the province of Fars, or Farfistan, (according to M'Kinner), 32 miles N.W. of Bushire or Busheer.

BENEDICT, abbot of Peterborough, &c. l. 5, *r.* Richard I.

BENIN, l. 8, *r.* Ardrah.

BENNET, col. 1, l. ult. for 1696 *r.* 1646 or 1656.

BENNINGTON, l. 6, for 12,254 *r.* 15,893, and *dele* 16 slaves.

BENNINGTON, l. ult., for 2400 *r.* 2524.

BENSALEM, in *Geography*, a township of Bucks county, in Pennsylvania, having 1434 inhabitants.

BENSON, or BENSINGTON, a village of Oxfordshire, on the road between Henley and Oxford. The parish contains 185 houses, and 825 persons; 414 being males, and 411 females.

BENSON, l. 4, for 658 *r.* 1561.

BENTOT. See CALTURA.

BERA. See BOLE-COMBA.

BERARDI, l. 8, for Orcani, &c. *r.* Arcani Musicali Dialogo, &c.

BERBERIDES, in *Botany*, the 78th natural order of Jussieu's system; the 18th of his 13th class: for whose characters, see GERANIA. This order is defined as follows.

Calyx of a determinate number of leaves, or deep segments. *Petals* definite also, agreeing in number with the divisions of the calyx, and often opposite to them; sometimes simple; sometimes charged at the base with an inner petal. *Stamens* definite, as many as the petals, and opposite to them; *anthers* fixed, bursting by a valve from the base upwards. *Germen* simple; style solitary or wanting; *stigma* often simple. *Berry* or capsule of one cell, often with several seeds, inserted into its base. *Coraculum* descending, flat, furrowed by a fleshy albumen. *Stem* either shrubby or herbaceous. *Leaves* generally alternate, with stipules, or more frequently without, simple or compound.

The genera are, *Berberis*, *Leontice*, *Epimedium*; with *Rinorea* and *Conoria*, two shrubs in Aublet's work, little known. To these are subjoined the following, as related to the order in question, viz. *Riana* of Aublet; *Corynocarpus* of Forster, and Linn. Suppl.; *Poraquiba* of Aublet, which is *Barreria* of Schreber's Gen. 598; *Hamamelis* of Linnaeus; *Othera* of Thunberg; and *Rapanea* of Aublet. These genera, says Jussieu, are in some of their characters akin, in others foreign, to the *Berberides*.

BERGEN, a county of America, &c. l. 9, for 12,601 *r.* 16,603; and for 2301 *r.* 2180.

BERGEN. Subjoin—Their number is 2690, of whom 390 are slaves.

BERGMANITE. See MINERALOGY, *Addenda*.

BERKELEY, col. 5, l. 52, to him, insert—the lesson in the burial-service, taken from 1 Cor. xv.; and he was commenting upon it, &c. Col. 6, l. 43, generally, insert—but not truly.

BERKHEYA, in *Botany*, (*Berkheya* is an error), a genus of compound flowers, justly dedicated to the honour of Dr. John le Francq van Berkhey, whose inaugural dissertation, published at Leyden, in 1760, is an elaborate and ample illustration of this difficult tribe, accompanied by nu-

merous

merous excellent figures.—Ehrh. Beitr. v. 3, 137. Schreb. Gen. 577. Willd. Sp. Pl. v. 3, 2269. Ait. Hort. Kew. v. 5, 138. (Agriphyllum; Juff. Gen. 190. Rohria; Thunb. Prodr. n. 52.)—Clafs and order, *Syngenesia Polygamia-fruſtranea*. Nat. Ord. *Compoſitæ*, Linn. *Corymbi-fera*, Juff.

Gen. Ch. corrected by Mr. Brown. *Common Calyx* of one leaf, clothed with many lanceolate, imbricated leaves, with ſpinous teeth, and ſpreading points; the lower ones ſhorter. *Cor.* compound, radiant. Florets of the diſk numerous, perfect, tubular, funnel-shaped, deeply five-cleft, glandular below; of the radius fewer, ligulate, lanceolate, four-toothed; glandular below, imperfect. *Stam.* in the florets of the diſk, Filaments five, capillary, very ſhort; anthers forming a tube with five teeth: in thoſe of the radius the anthers are ſhort and incomplete. *Piſt.* in the florets of the diſk, Germen turbinate, ſhort, hairy; ſtyle thread-shaped, longer than the ſtamens; ſtigmas two, revolute: in thoſe of the radius, Germen ſmall, with hardly any ſtyle, and no ſtigmas. *Peric.* none, except the permanent calyx. *Seeds* of the diſk ſolitary, turbinate, hairy, crowned with from ten to fifteen chaffy, lanceolate, finely ferrated, or fringed, ſcales: of the radius none. *Recept.* flat, cellular, the cells membranous, jagged and toothed.

Eff. Ch. Receptacle cellular. Seeds hairy. Crown chaffy, ferrated or fringed. Calyx of one leaf, clothed with imbricated leafy ſcales.

The ſpecies of this genus, twenty-two in Willdenow, are confined to the Cape of Good Hope and its neighbourhood. Four of them occur under this name in Hort. Kew. as green-houſe plants, flowering in ſummer; three others compoſe Mr. Brown's genus *CALLUMIA*, to be deſcribed hereafter. They are generally perennial, often ſhrubby. They embrace Thunberg's whole genus of *ROHRIA*, (ſee another genus of that name in its proper place,) and ſeveral of them have been referred by Linnæus to *Gorteria*, *Atractylis*, or even *Xeranthemum*. None has yet appeared in any of our English periodical works. We ſelect a few examples.

B. incana. Hozy Shrubby Berkheya. Willd. n. 1. Ait. n. 3. (B. fruticofa; Ehrh. Beitr. v. 3, 138. ("Rohria incana; Thunb. in Act. Soc. Nat. Scrut. Hafn. v. 3, 106. t. 11." *Gorteria aſteroides*; Linn. Suppl. 381. Jacq. Ic. Rar. t. 591. *G. fruticofa*; Linn. Sp. Pl. 1284. *Atractylis fruticofa*; ibid. ed. 1, 829. *Carthamus africanus fruteſcens*, folio ilicis ſpinofa, flore aureo; Walth. Hort. 13, t. 7.)—Leaves alternate, ovate, ſpinous-toothed; hoary beneath, like the ſtem. Calyx-ſcales with ſpinous teeth; hoary underneath.—Native of the interior regions of the Cape of Good Hope, in dry ſituations. The ſtem is various in height, with ſlender branches. Leaves recurved, three-ribbed, an inch and a half long, coarſely toothed; tapering at the baſe. Flowers terminal, ſolitary, near three inches in diameter, deep yellow.

B. obovata. Smooth Shrubby Berkheya. Willd. n. 2. Ait. n. 2. (*Gorteria ſpinofa*; Linn. Suppl. 381. "*Bacteria aculeata*; Hoult. Nat. Hiſt. v. 6, 158. t. 34. f. 2." *Ait.*)—Leaves alternate, wedgeſhaped-lanceolate, ſpinous-toothed, ſmooth on both ſides. Calyx-ſcales with ſpinous teeth.—Sent from the Cape to Kew Garden, by Mr. Maſſon, in 1794. Akin to the laſt, but with narrower leaves, and the whole plant is ſmooth.

B. grandiflora. Large-flowered Berkheya. Willd. n. 7. Curt. Mag. t. 1844. (*Rohria grandiflora*; Thunb. Prodr. 140. "*R. ilicifolia*; Vahl Act. Soc. Nat. Scrut. Hafn. v. 2, 40. t. 7." *Atractylis oppoſitifolia*; Linn. Mant. 477. *Gorteria fruticofa*; Berg. Cap. 302, but not Linn. Sp. Pl. 1284.)—Leaves oppoſite, lanceolate, three-ribbed, ſpi-

nous-toothed; downy beneath. Calyx-ſcales with ſpinous teeth.—Native of hills about Riet-valley and Buffeljagts river, at the Cape. The ſtem is ſhrubby, with downy branches. Leaves above an inch long. Flowers terminal, ſolitary, large, of a full golden yellow, with a downy calyx.

B. cynaroides. Artichoke Berkheya. Willd. n. 19. Ait. n. 1. (*Rohria cynaroides*; Thunb. Prodr. 140. *Gorteria herbaacea*; Linn. Suppl. 381.)—Stem-leaves alternate, clapping, fringed with prickles; radical ones elongated, entire, unarmed; downy beneath. Calyx-ſcales ovate, freight, ſpinous, nearly entire.—Sent to Kew, from the Cape, in 1789, by Mr. Maſſon. The ſtems are herbaceous, a foot or more in height, angular, nearly ſmooth. Leaves rigid, or ſomewhat coriaceous; the radical ones three or four inches long, tapering at the baſe. Calyx ovate, ſmooth, ſtrongly armed; two or three of the lower ſcales only being fringed, like the adjoining *bractææ*.

B. cernua. Drooping Berkheya. Br. in Ait. n. 4. (*Gorteria cernua*; Linn. Suppl. 382. Willd. Sp. Pl. v. 3, 2268.)—Leaves alternate, lanceolate, clapping, ſpinous-toothed, fringed, ſmooth on both ſides. Flowers drooping. Seed-crown brightly, fringed.—Sent from the Cape, in 1774, by Mr. Maſſon. Biennial, flowering from May to July. Leaves lightly cottony when young only. Calyx ſpinous.

BERKLEY, in Virginia, l. 5, r. 11,479, of whom 1529 are ſlaves.

BERKLEY, in Maſſachuſetts, r. 1014.

BERKLEY, col. 3, l. 16, for township r. pariſh; for 90 r. 124; and for 658 r. 616, 296 being males, and 320 females. L. 18, infer after act, in 1811; for 3450 r. 3808; for 9,148 r. 10,144; for 10,074 r. 11,248. Add—1721 families employed in agriculture, and 2215 in trade and manufactures; and for 19,222 in l. 21, r. 21,362.

BERKS, l. 9, r. 43,146, of whom four are ſlaves.

BERKSHIRE, in Maſſachuſetts, l. 6, r. 35,907.

BERKSHIRE. After Vermont, add—containing 918 inhabitants.

BERKSHIRE, col. 2, l. 20, r. This county contains 22,104 houſes, and 118,297 perſons; 57,380 being males, and 60,917 females: 13,409 families employed in agriculture, and 7584 in trade and manufactures.

BERKSHIRE, a township of Delaware county, in the diſtrict of Ohio, containing 284 inhabitants.

BERLIN, in Vermont, for 134 r. 1067.—In Connecticut, add—the number of inhabitants, in 1810, was 2798.—In Worceſter county, for 512 r. 591.—In Sommerſet county, infer—the number of inhabitants, in 1810, was 330.

BERNACCHI, l. 13, r. when he was paſt his medication.

BERNARD, St., a pariſh of the territory of Orleans, in the county of Orleans, containing 1020 inhabitants, of whom 382 are ſlaves.

BERNARDSTOWN, l. 2, r. 1879; l. 4, r. 811.

BERNE, a township of the diſtrict of Ohio, in the county of Fairfield, having 976 inhabitants.

BERNHARDIA, in *Botany*, ſo named by profeſſor Willdenow, in honour of Dr. John James Bernhardt, of Erfurt, a learned writer on Ferns, and in other reſpects an excellent cryptogamic botaniſt.—Willd. in Act. Acad. Erford. for 1802. 11. Sp. Pl. v. 5, 56. Purſh 655. (See *PSILOTON*, under which name we have treated of this genus in due order.) We know not whether any other genus be already dedicated to Dr. Bernhardt, but it is to be preſumed that this act of juſtice will not long be delayed.

BERTIE, l. 5, r. 11,218; l. 6, r. 6059.

BERVIE, l. ult. r. The burgh and pariſh contain 193 houſes,

houses, and 927 persons; 415 being males, and 512 females.

BERWICK, NORTH. Add—The burgh and parish contain 208 houses, and 1727 persons; 759 being males, and 968 females.

BERWICK, col. 3, l. 26, infer—in cruives. Add—The town and county of Berwick-upon-Tweed, by the parliamentary return of 1811, contained 934 houses, and 7746 persons; 3325 being males, and 4421 females.

BERWICK, a town of Adams county, in Pennsylvania, having 1799 inhabitants.

BERWICK, in Maine, l. 2, r. 4455 for 3894.

BESANÇON, l. 2 and 3, r. capital of Franche Comte, now of the department, &c.

BESANT, l. ult. r. under Henry.

BESITTOON, a long range of barren mountains, in the province of Irak, in the Persian empire, bounding the plain of Kermanshaw to the N. and terminating abruptly on the E. by a high and perpendicular rock, in one place cut to a smooth surface, and projecting over the road, like a canopy. It receives its name from *sitton*, signifying, in Persian, a pillar, and *be*, a negative proposition. Near its projection, on a high and inaccessible part of the rock, is a group of figures, in the form of a procession, of the same age and character with those of Persepolis. The ruins at this place resemble the magnificent ones of that famous city.

BESLICK, a small Turkish silver coin, equal to 5 paras, the para being 3 aspers.

BESSARABIA, col. 2, l. 9, for fourth-east r. fourth-west.

BESTIAN, or BOSTANA, a cape of Laristan, in Persia, which forms one of the most secure roadsteads in the gulf of Persia, at the town of Mogoo. The extremity is about N. lat. 26° 30', bearing from Polior N.N.E. $\frac{3}{4}$, and W. from the S. end of Kishma. Shinaas and Bostana are small towns that lie between Linga and Cape Boitana.

BETHEL, in Geography, l. 3, Lowermost Bethel is a township of Northampton county, having 1392 inhabitants; and Uppermost Bethel, in the same county, has 1188 inhabitants.—After Dauphin county, add—having 2091 inhabitants; l. 4, r. 1041; at the close, add—a township of Maine, in the county of Oxford, having 975 inhabitants.—Also, a township in Bedford county, containing 1095 inhabitants.—Also, a township of Ohio, in the county of Miami, having 506 inhabitants.—Also, a township of Champaign county, in Ohio, having 484 inhabitants.

BETHLEHEM, col. 4, l. 10, add—Also, a town of New Hampshire, in Grafton county, having 422 inhabitants; l. 13, r. 1738; l. 15, add—having 1118 inhabitants; l. 26, add—but by the census of 1810, they are stated to be 1436.

BETHLEHEM, E. and W., two townships of Pennsylvania, in Washington county; the former has 1805, and the latter 1849 inhabitants.

BETLIS. Subjoin—See BEDLIS.

BEVEL ANGLE, l. 3, Plate III. Col. 3, l. 35, r. A β , B β .

BEVERLEY, l. ult. In 1811, the borough and liberties of Beverley contained 1457 houses, and 6731 persons; 3024 being males, and 3707 females.

BEVERLY, l. 5, r. 4608.

BEVERSTONE, l. 7, r. Edward.

BEWCASTLE. Add—The township includes 35 houses, and 198 persons; 103 being males, and 95 females.

BEWDLEY, l. ult. r. The borough contained, in 1811,

632 houses, and 3454 persons; 1583 being males, and 1871 females.

BEZOZZI, col. 2, l. 8, r. The eldest, &c.; l. 18, composition; l. 26, do.; l. 27, for the r. their; after delicacy, infer—there was; l. 40, infer—a labour exquisite in performance.

BIBIENA, FERDINANDO-GALLI, l. 12, r. Alexander; l. 14, r. generosi.

BIBLES, LATIN. See Italic VERSION.

BICE. Add—See CAST.

BIDDEFORD, in America, l. 5, r. 1563.

BIDDEFORD, col. 3, l. 2, r. 634 houses, and 3244 persons; 1415 being males, and 1829 females.

BIGELOVIA, in Botany, a genus which we here dedicate to our highly intelligent and scientific correspondent, Jacob Bigelow, M.D. of Boston in New England, Rumford professor of Materia Medica and Botany in Harvard university, author of the *Flora Bostoniensis*, published in 1814; and of the American Medical Botany, with coloured plates, now publishing periodically; works which, we are confident, will be but the forerunners of more ample and valuable communications from the same quarter. We have selected for the commemoration of our friend an American genus, to which the name of BORYA, (see that article hereafter,) has been erroneously applied, and which therefore requires a new appellation. We have chosen one as indispensible as the genus itself, whose synonyms are the following.—(Borya; Willd. Sp. Pl. v. 4, 711. Pursh 22. Ait. Hort. Kew. v. 5, 365. Adelia; Michaux Boreal.-Amer. v. 2, 223. Browne Jam. 361, but not of Linnaeus.)—Claf and order, *Diocia Diandria*. Nat. Ord. *Septariae*, Linn. *Jasmineae*, Juss.

Gen. Ch. Male, Cal. Perianth minute, in four deep, erect, lanceolate segments. Cor. none. Stam. Filaments two or three, thread-shaped, longer than the calyx, inserted into the receptacle; anthers roundish, two-celled.

Female, on a separate plant. Cal. Perianth in four deep, oblong, slightly spreading, deciduous segments; two opposite ones very minute, and sometimes wanting. Cor. none. Pist. Germen superior, roundish-ovate, of two cells; style short, cylindrical, thickish; stigma capitate, depressed, obscurely cloven. Peric. Berry oval-oblong, of one cell, its internal surface cartilaginous and rugged. Seed almost always solitary, oblong, tapering at each end, furrowed and ribbed longitudinally, with a membranous skin; its embryo straight, in a horny albumen.

Eff. Ch. Male, Calyx deeply four-cleft. Corolla none. Stamens two or three.

Female, Calyx deeply four-cleft; two opposite segments smallest. Corolla none. Stigma capitate. Berry with one seed.

Obf. The description of Michaux, and his hint of the affinity of this genus to *Chionanthus*, have helped us to form, we trust, a correct idea of its characters. Willdenow had seen specimens of Browne's *Adelia*, and he probably had the sanction of the able M. Richard for uniting it with that of Michaux, the latter having already so decided this question; nor do we see any reason for a different opinion.

The species are all shrubby, with opposite, undivided, mostly entire, smooth leaves, and minute, tufted, bracteated flowers. The fruit is probably not eatable.

1. *B. cassinoides*. Elliptical Bigelovia. (Borya cassinoides; Willd. n. 1. *Adelia* n. 1; Browne Jam. 361. t. 36. f. 3.)—Leaves stalked, obovate, obtuse, coriaceous, revolute; reticulated with veins beneath.—Native of the West Indies. Common on low gravelly hills, eastward of Kingston, in Jamaica. Sometimes eight or ten feet high,

with

with slender leafy branches. Flowers in little axillary tufts, or clusters. Leaves about an inch and a half long, smooth, entire. Br.

2. *B. porulosa*. Pierced Bigelovia. (*Borya porulosa*; Willd. n. 2. Pursh n. 1. Ait. n. 1. *Adelia porulosa*; Mich. Bor.-Amer. v. 2. 224.)—Leaves sessile, oblong-lanceolate, obtuse, coriaceous, revolute; dotted beneath.—On the coasts of Georgia and Florida. The leaves are rusty, and as if pierced with little dots, beneath. *Michaux*.

3. *B. ligustrina*. Privet-leaved Bigelovia. (*Borya ligustrina*; Willd. n. 3. Pursh n. 2. Ait. n. 2. *Adelia ligustrina*; Mich. Bor.-Amer. v. 2. 224.)—Leaves oblong-lanceolate, somewhat membranous, entire, on short stalks. Berry roundish-ovate.—Native of thickets and woods about rivers, in the countries of the Illinois, Tennessee, &c. flowering in July and August. This has the habit and foliage of our Privet. *Michaux*.

4. *B. acuminata*. Pointed Bigelovia. (*Borya acuminata*; Willd. n. 4. Pursh n. 3. Ait. n. 3. *Adelia acuminata*; Mich. Bor.-Amer. v. 2. 225. t. 48.)—Leaves ovato-lanceolate, membranous, stalked, slightly ferrated, acute at each end. Unripe berry oblong, taper-pointed.—On the banks of rivers in Carolina and Georgia. The taper lateral branches appear to form something like thorns. The leaves are an inch and a half long. Male flowers very together, in small sessile tufts, encompassed with several ovate bractees; female ones stalked, very small. Berries pendulous, elliptic-oblong, near an inch in length.

The three latter species are recorded by Mr. Aiton, to have been brought into England by Mr. John Lyon, the *porulosa* in 1806, the two others in 1812. They are hardy shrubs, but do not appear to have yet flowered.

BIGNONIÆ, the 45th order in Jussieu's system; the 12th of his 8th class, whose characters are given at GENTIANÆ. The following is that author's definition of the order before us.

Calyx divided. *Corolla* mostly irregular, with four or five lobes. *Stamens* usually five, one of which is, for the most part, abortive, or imperfect. *Style* one; *stigma* either simple or two-lobed. *Fruit* of two cells; sometimes capsular, with many seeds, and with two perfectly separate valves; the seed-bearing partition opposite or parallel to the valves, and separable therefrom: sometimes coriaceous or woody, bursting at the top only, with but few seeds, the seed-bearing partition a continuation of the valves, not separable, and often sending out a slight wing, dividing each cell into two. *Cocculum* unattended by albumen. *Stem* herbaceous, shrubby, or arborescens. *Leaves* opposite, rarely alternate.

SECT. 1. *Fruit capsular, bivalve*. *Stem herbaceous*, *Chelone* and *Sesamum*, with Jussieu's *Incarvillea*, Lamarck Illustr. t. 527, compose this section.

SECT. 2. *Fruit capsular, bivalve*. *Stem arborescens* or shrubby.

Millingtonia of Linnæus; *Jacaranda*, *Catalpa*, and *Tecoma* of Juss. with *Bignonia* of Linnæus.

SECT. 3. *Fruit coriaceous, almost woody, opening at the top*. *Stem herbaceous*.

Tourretia of Dombey and Juss.; *Martynia*, *Craniolaria*, and *Pedicularia* of Linnæus.

Mr. Brown, Prodr. Nov. Holl. v. 1. 470, retains the second section only, under the name of *Bignoniaceæ*, to which he adds the genus *SPATHODEA*. See that article.

BIGONCIA, in Commerce, a liquid measure in Venice. See AMPHORA.

BILE, *Chemical properties of*. Bile has been lately denied by Berzelius to contain a resinous or adipocirous matter, as had been maintained by former chemists. The substance pecu-

liar to bile, or, as it is denominated by him, the *biliary principle*, has an excessively bitter taste, followed by some sweetness. Its smell is peculiar, and the colour in most animals varies from green to greenish-yellow. It is soluble in water, and its solubility is not in the least promoted by the alkali of the bile, since when the alkali is neutralized by any acid, the peculiar matter does not separate. It likewise dissolves in alcohol in all proportions. Like the albuminous materials of the blood, of which this peculiar matter is composed, it will unite with acids producing two compounds of two degrees of saturation, and hence of solubility. The dilute acetic acid which gives soluble compounds with the albumen of the blood, does the same with the peculiar matter of the bile; and hence this matter is not precipitated on adding this acid to bile, though it falls down on the addition of the sulphuric, nitric, or muriatic acids. It is this sparingly soluble compound of biliary matter with a mineral acid which has been mistaken by many chemists for a resin, since it possesses the external characters of a resin, melts when heated, dissolves in alcohol, and is again partly precipitated by water. The alkalies, alkaline earths, and alkaline acetates, decompose and dissolve it; the former by depriving it of its combined acid, the latter by furnishing it with acetic acid, which renders it soluble in water.

The peculiar matter of bile will also combine with many of the metallic oxyds. The degree of the solubility possessed by the compound of acid and biliary principle, varies according to the length of time that the bile has been kept, and also according to the species of the animal.

The biliary matter may be obtained in a state of purity by mixing fresh bile with sulphuric acid diluted with three or four times its weight of water. A yellow precipitate first appears, which is to be allowed to subside, and then removed; more acid is then to be added as long as any precipitate is formed; heat the mixture gently for some hours, and afterwards decant the fluid part, and thoroughly wash the green mass left. This green resinous-like mass reddens litmus, and is partially and sparingly soluble in water. It may be deprived of its acid either by the carbonate of barytes, or by the carbonate of potash or lime, and thus obtained pure. It is now soluble in water, and forms a green solution, having all the properties of bile. It is insoluble in ether, which converts it into an adipocirous mass. When burnt it yields no ammonia, and consequently contains no azote.

The following are the results of Berzelius's analysis of bile:

Water	-	-	-	-	-	907.4
Biliary principle described above	-	-	-	-	-	80.0
Mucus of the gall-bladder, &c. dissolved in the bile	-	-	-	-	-	3.0
Alkalies and salts, common to all secreted fluids	-	-	-	-	-	
						1000.0

The bile of other animals has been but imperfectly examined. It resembles in its general characters the human bile above-mentioned.

BILLARDIERA, in Botany, so named by the writer of this, in honour of his friend James Julian la Billardiere, (or, as it is now written, Labillardiere), M.D. author of *Icones Plantarum Syria Rariorum*, the fruits of his journey to the Levant, in 1786; and since much better known by his valuable *Novæ Hollandiæ Plantarum Specimen*, in two volumes folio, with many plates. An account of his voyage to New Holland, in search of the unfortunate Lapeyroule,

contains also much botanical matter, and has been published in English, at London, in 1802, with plates. M. Labillardiere has always distinguished himself as a classical botanist, of the Linnæan school, preferring the interests of science to those of system, and following no leader but what he conceives to be truth.—Smith Bot. of New Holl. 1. Labill. Nov. Holl. v. 1. 64. Willd. Sp. Pl. v. 1. 1150. Ait. Hort. Kew. v. 2. 39.—Class and order, *Pentandria Monogynia*. Nat. Ord. uncertain. Akin to *Pittosporum*, and therefore to the *Rhamnii* of Jussieu, as they stand at present. *Salisb.*

Gen. Ch. *Cal.* Perianth inferior, of five lanceolate, coloured, equal, deciduous leaves. *Cor.* Petals five, inserted into the receptacle, alternate with the calyx, and twice as long, linear-lanceolate, erect; their claws more or less converging in the form of a tube; border spreading, acute, recurved. Nectary none. *Stam.* Filaments five, inserted into the receptacle, alternate with the petals, the length of the claws, awl-shaped; anthers ovate-oblong, attached by the back, of two cells, bursting lengthwise, internally. *Pist.* Germen superior, elliptic-oblong; style awl-shaped, the length of the filaments; stigma obtuse. *Peric.* Berry roundish-oblong, of two cells. *Seeds* numerous, roundish, inserted into the central column.

Effl. Ch. Calyx of five leaves, deciduous. Petals five, alternate with the calyx, converging into a tube. Stigma obtuse. Berry superior, of two cells, with many seeds.

The species are all slender, twining, branched *shrubs*, with scattered, simple, undivided, nearly entire, more or less downy, leaves, on short footstalks. *Flowers* and fruit pendulous, on terminal stalks.

1. *B. scandens*. Climbing Billardiera, or Apple-berry. Sm. Bot. of New Holl. 1. t. 1. Willd. n. 1. Ait. n. 1. Curt. Mag. t. 801.—Leaves elliptic-lanceolate. Berry cylindrical, obtuse, downy.—Native of Port Jackson, New South Wales, from whence we received specimens and coloured drawings, by the kindness of Dr. White. Sir Joseph Banks sent seeds, or plants, to Kew, in 1790, and we have since seen flowers and ripe fruit in many conservatories. A low *shrub*, with variously twisted and climbing branches. *Leaves* an inch and a half or two inches long, elliptic-oblong, of a dull but not dark green; paler and most downy beneath; their edges somewhat wavy and reflexed, scarcely notched. *Flowers* on hairy stalks, pale lemon-coloured, an inch long, with a hairy yellowish calyx; Germen very hairy. *Berry* above an inch in length, cylindrical, equally obtuse at each end, yellow, downy all over, full of brown seeds, its pulp soft, sweet, but rather insipid in this country, though said, in a wild state, to resemble a roasted apple. The figure in the Botany of New Holland was taken from a drawing made in that country. We readily concur with our friend Dr. Sims, in Curt. Mag. p. 1507, that it is impossible to find a name which will contrast the only known species of a genus, with all that may hereafter be found, and it happens that all the *Billardiera* are climbers. The appellation above, therefore, serves to shew the present to have been the originally described species. There are several such instances in the history of Linnæan genera, nor would it be allowable to alter the original specific name on this account.

2. *B. mutabilis*. Changeable-flowered Billardiera. *Salisb.* Parad. t. 48. Ait. n. 2. Curt. Mag. t. 1313.—Leaves linear-lanceolate. Berry cylindrical, obtuse, smooth.—Native of New South Wales. Easily cultivated in a greenhouse, and increased by cuttings or seeds. The leaves are narrower and smoother than in the foregoing species. The *flowers*, at first of a pale greenish-yellow, turn purple before

they fall. The *germen* and *fruit* are said to be always smooth, the form of the latter agreeing with *B. scandens*. *Flower-stalks* smooth.

3. *B. fulviformis*. Spindle-shaped Billardiera. Labill. Nov. Holl. v. 1. 65. t. 90.—Leaves oblong-lanceolate. Flowers aggregate. Petals spreading. Berry spindle-shaped, pointed, silky, dry.—Gathered by M. Labillardiere at the Cape of Van Diemen, in December. The stem is generally climbing. *Leaves* somewhat hairy, larger than in the last. *Flowers* from two to six at the end of each branch, forming more or less of a cluster, blue, the petals more ovate, and spreading from the base, than in other species. *Anthers* converging. *Berry* small and tapering, of a membranous texture, silky, destitute of pulp.

4. *B. longiflora*. Blue-berried Billardiera. Labill. Nov. Holl. v. 1. 64. t. 89. Curt. Mag. t. 1507. Ait. Epit. 364.—Leaves lanceolate. Petals converging. Berry nearly globular, lobed, smooth.—Native of the same country as the last. Raised here by Messrs. Loddiges. The *flowers* are solitary, pale yellow, longer and more tubular than in any of the rest. *Fruit* remarkably different, being short and roundish, of a fine blue. Dr. Sims has well observed, that this part affords, in the present genus, the best specific distinctions.

BILLERICA, l. 2, r. 1289.

BILLS, ECHEQUEUR. See ECHEQUEUR-Bills.

BILL of Health, an account of the health of a crew, given by the captain or master of a vessel.

BILLS, India, bills drawn in India on the East India company in London, and payable at the India-house.

BILLS, *Virtualing*. See NAVY and *Virtualing Bills*.

BILLYMEAD, a town of Vermont, in the county of Caledonia, containing 433 inhabitants.

BILSTON, l. ult. for 1305 r. 1818; and for 6914 r. 9646.

BILSTON, l. ult. for 121 r. 110; and for 744 r. 762.

BIR. Add—According to M. d'Anville this place represents the ancient Birtha. The caravans travelling from Aleppo to Orfa pass the Euphrates on a bridge of boats at this place, situated 144 miles from Aleppo, and 67 from Orfa, in N. lat. 36° 58'. A tax is paid at this town, which is in a dilapidated state; and all travellers and merchants cross the Euphrates, which is here deep and rapid, and about 130 yards broad.

BIRDS, *Anatomy of*. The references to the plates to be expunged. Col. 7, l. 33, after another, insert—a good instance of which is found in, &c. ending heron; l. 35, r. The bulbus in the ostrich is a long narrow band lying on the front of the stomach. The structure, &c.; l. 53, *dele* like other, &c. to secretion. Col. 9, l. 42, for superficial view r. slight examination. Col. 11, l. 20, after intestine *dele* to ventricle, l. 34; and insert—If the cavity of the stomach in the heron be distended with any transparent fluid and held up to the light, the zone of gastric glands will be plainly seen through its coats. If Spallanzani had employed this expedient, he could not have denied a distinct glandular structure to the heron. The inferior part of the stomach is chiefly composed of muscular fibres, spreading in a radiated manner from a lateral aponeurosis, which supplies the place of the great tendons of the digastric muscle. The second cavity or stomach in the heron is a small round bag, furnished only with circular muscular fibres; l. 35, for straight r. contracted. Col. 13, l. 14, *dele* fo; l. 15, after respect *dele* to the end of the paragraph. Col. 14, l. 15, *dele* after adjoining to the end of the paragraph. Col. 16, l. 16 from the bottom, after receive, insert—some of. Col. 19, l. 28 from the bottom, insert after by—one of the ablet

ablest chemists, &c. Col. 20, l. 26 from the bottom, *dele* as in mammalia. Col. 31, l. 22 from the bottom, *dele* bronchiae, &c. to cells, and infert—and the branches of the air-tubes. Col. 32, l. 28, for facks *r. facs*. Col. 35, l. 11, for of *r. off*. Col. 36, l. 7 from the bottom, *r.* like the air contained in the swimming bladder of fishes, with respect to the water. Col. 47, l. 17, *r.* quadrupeds. The trunk, &c. Col. 51, l. 13 from the bottom, *dele* from urine to the end of the paragraph.

BIRD, in *Geography*, a township of Adams county, in the district of Ohio, containing 1442 inhabitants.

BIRMINGHAM. Add—In 1811, the town of Birmingham contained 16,653 houses, and 85,753 persons; 40,518 being males, and 45,235 females; 589 families employed in agriculture, and 17,294 in trade and manufactures.

BIRMINGHAM, a township of Delaware county, in Pennsylvania, having 586 inhabitants.—Also, a township in Chester county, of the same state, having 200 inhabitants.

BISHOP'S CASTLE, l. *ult. r.* The borough, in 1811, contained 288 houses, and 1367 persons; 651 being males, and 716 females.

BISHOP'S Stortford, col. 2, l. 36, *r.* The parish contains 479 houses, and 2630 persons; 1255 being males, and 1375 females.

BISLEY, l. *ult.* for 922 *r.* 1022; and for 4227 *r.* 4757.

BISMUTH, in *Chemistry*. There seems to be but one oxyd of this metal. What was formerly termed the *magistery of bismuth*, and considered as a peroxyd, has been demonstrated by Bucholz to be a compound of the oxyd of bismuth and nitric acid.

Dr. Thomson has determined 88.75 to be the combining weight or weight of the atom of bismuth. According to this determination, the oxyd of bismuth will consist of

Bismuth	100	}	or per cent. of	{ 89.87
Oxygen	11.2672			

From the above number, and from the known weights of the different acids, the composition of all the salts of bismuth can be accurately ascertained. See PROPORTIONS, *Definite*, and ATOMIC Theory, *Addenda*.

BISON, in *Zoology*. See BOS and URUS.

BISSEXTILE, col. 2, l. 22, *r.* 1752.

BISTAM, infert—or BISTAN. Add—See SUMNUM and SHARU.

BISTINEAU, in *Geography*, a lake of Louisiana, formed by the agency of Red river, which has raised a bank of earth and sand across the lower extremity of a valley that serves to confine the waters between the hills at all seasons, and to produce this lake. The land along its banks rises into hills from 100 to 200 feet of elevation, clothed with pine, oak, and various other trees, that afford agreeable prospects. The eastern range, more broken than the western, abounds more with petrifications; and along the margin of the water, are found the white-thorn, hawthorn, and other dwarf trees, which form an elegant natural border. Many small prairies, eight or ten acres in extent, spread themselves over the projecting banks, and diversify this wild, uncultivated, but romantic scene. This lake furnishes evidence of the continual change effected in these alluvial regions, by the slow but unceasing action of water. The average depth of the water is from fifteen to twenty feet; and in the deepest part of the lake presents to view cyprus-trees of various sizes that are dead, and the remains of which, resisting the action of air and water, attest the ancient situation of the country. Darby's Louisiana.

BIT, in *Commerce*. Add—1 bit being worth $5\frac{2}{3}$ sterling, as 10 bits and 5d. currency make a dollar.

BITTER PRINCIPLE, *Natural and Artificial*, in *Chemistry*. This name has been given by chemists, and especially by Dr. Thomson, to different principles, extracted from various vegetables, particularly from *quassia*, *cocculus indicus*, *squills*, and some others. Though the characteristic property of these substances be their bitter taste, yet this appears to be almost the only particular in which they all agree. The bitter principle of *quassia*, according to Dr. Thomson, is of a brownish-yellow colour, somewhat transparent, of an intensely bitter taste, soluble in water and alcohol, has no effect on vegetable blues, and is little affected by re-agents; the nitrate of silver, and acetate of lead, being the only ones that precipitate it from its solution. It may be obtained by digesting *quassia* for some time in water, and evaporating the solution formed to dryness. The bitter principles extracted from *colocynth*, *brionia alba*, and from *wheat-flour*, seem to possess properties analogous to the above. The bitter principle from *cocculus indicus*, which has been named PICTOXYN, is described under that article.

The bitter principle of *squills* is white and transparent. It is soluble in water and alcohol, and rapidly attracts moisture from the atmosphere. Its taste is intensely bitter; though it usually retains a little saccharine matter with great obliquity. It was obtained by Vogel by evaporating the juice to dryness, and heating it with alcohol; the tannin taken up by the alcohol was separated by the acetate of lead, and thus the bitter principle, obtained in the state above described, combined with a little sugar, from which it was found impossible to entirely free it. The bitter principle of coffee principally differs from the preceding by the property it possesses of striking a green colour with iron, and of precipitating that metal from concentrated solutions.

According to the experiments of Bouillon la Grange, a substance not much unlike the above exists in the flowers of the *arnica montana*, *absinthium vulgare*, *juniperus sabinus*, *ruta graveolens*, *anthemis nobilis*, and *achillea millefolium*.

The artificial bitter principle seems to have been first formed by Hauffman from indigo, though he mistook its nature. Wether afterwards obtained it from silk, ascertained its properties, and gave it the name of *yellow bitter principle*. It was afterwards obtained by Bartholdi from the white willow. Mr. Hatchett formed it, during his experiments upon artificial tannin, by heating indigo with nitric acid; and about the same time Fourcroy and Vauquelin procured it by the same means, and examined its properties. M. Chevreul supposes it to be a compound of nitric acid and a vegetable substance, probably of an oily nature. Its colour is deep yellow, and its taste intensely bitter. It is soluble in water and alcohol. It crystallizes in elongated plates, and possesses many of the properties of an acid, combining with alkaline substances, and forming crystallizable salts possessing peculiar properties.

The artificial tannin itself is by some chemists considered as little better than a variety of the bitter principle. See TANNIN, *Artificial*.

BITTERN. See WATER.

BITUMINOUS Marle Slate. See MINERALOGY, *Addenda*.

BIVOUACKE, BIVOUAC, or *Bigvack*, Fr. formed from the German *way-wacht*, a double watch or guard, denotes a night-guard, or a detachment of the whole army, which, during a siege, or in the presence of an enemy, marches out every night in squadrons or battalions, to line the circumvallations, or to take post in front of the camp, for

for the purpose of securing their quarters, preventing surprisings, and obstructing supplies. When an army does not encamp, but lies under arms all night, it is said to "bivouacke."

BLACKBURN, l. 28, for 24 r. 23. Col. 2, l. 4, r. Blackburn township contained, in 1811, 2945 houses, and 15,083 persons; 6953 being males, and 8130 females: 45 families employed in agriculture, and 2861 in trade and manufactures.

BLACK-LAKE RIVER, in *Geography*, a river of Louisiana, that rises in the same ridge of hills with the Saline, and uniting with it, joins the Rigolet de bon Dieu, 8 miles N.E. of Natchitoches. Here the state of Louisiana begins to rise into elevations of some considerable note. The features of a mountainous country now present themselves, ledges of a loose sand-stone rock abound, nodules of iron-ore are every where met with, and petrifications of the most diversified forms are strewn over every slope. These petrifications generally appear to have undergone their change from ligneous to the siliceous state in which they are found, and to have been imbedded in an argillaceous clay, which, by induration, incloses them in its mass. Darby's Louisiana.

BLACKLICK, a township of Indiana, in the state of Pennsylvania, having 965 inhabitants.

BLACKROD, a township of Bolton parish, in the hundred of Salford, and county of Laneaster, containing 373 houses, and 2111 persons; viz. 1044 males, and 1065 females. See **WIGAN**.

BLADEN, l. 2, r. 5671; l. 3, 1985.

BLAFFERT, in *Commerce*, a small coin at Cologne; 20 blafferts in account being = the six-dollar specie, and 19½ blafferts being the six-dollar current; 16 blafferts = a rader florin; 2½ blafferts = a shilling; and a blaffert = 4 albus. There are silver blafferts, and half ditto.

BLAINVILLE, col. 2, l. 19, r. Serre.

BLAIR, ROBERT, in *Biography*, a Scotch divine and poet, was the eldest son of the Rev. David Blair, one of the ministers of Edinburgh, and chaplain to the king; and the grandson of the Rev. Robert Blair, minister of the gospel at Bangor in Ireland, and afterwards at St. Andrew's in Scotland, celebrated for his piety, and for his inflexible adherence to Presbyterianism, in opposition to those who endeavoured to establish episcopacy in Scotland. The subject of the present article was born in 1699, and after preparatory studies was ordained minister of Athelstaneford, in East Lothian, where he resided until his death, Feb. 4, 1747. The late right hon. Robert Blair, president of the court of session in Scotland, who died in 1811, was one of his sons, and Dr. Hugh Blair, (see his article,) was his cousin. His only literary production, we apprehend, was a poem, intitled "The Grave," which was long disregarded, and which, though more lately recommended to attention by Hervey, who first printed it, and Mr. Pinkerton, in his "Letters of Literature," has no claim on any high degree of commendation. It is destitute of plan, unembellished by any of the ingenious graces of poetry, and degraded by satirical strokes on physicians and undertakers, warm expressions, and ill-chosen epithets. Upon being previously submitted to Dr. Watts and Dr. Doddridge, the author had no encouragement to publish it: however, it was printed at London in 1743, and is perused by persons of a serious disposition. Biog. Dict. by Chalmers.

BLAIZE, ST., Cape, in *Geography*. See **MOSSSEL'S BAY**.

BLANDFORD, col. 2, l. 30, r. contained, in 1811, 431 houses, with 2425 inhabitants; 1017 being males, and 1408 females.

BLANDFORD, in America, l. 6, r. 1613.

BLANDFORDIA, in *Botany*, received its name from the writer of the present article, in honour of his grace George duke of Marlborough, at that time marquis of Blandford, an honorary member of the Linnæan Society, and one of the most ardent botanists and cultivators that this country ever possessed in any rank of life. A genus belonging to what Linnæus terms the Patrician order, was judged peculiarly eligible for this purpose; nor can any one be more distinct, few more beautiful.—*Sm. Exot. Bot. v. 1. 5. Brown Prodr. Nov. Holl. v. 1. 295. Ait. Epit. 364.*—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Coronaria*, Linn. *Narcissi*, Juss. *Hemerocallidæz*, Br. Ord.

Gen. Ch. *Cal.* none. *Cor.* of one petal, inferior, tubular, straight, with six marginal lobes, regular, withering. *Stam.* Filaments six, thread-shaped, inserted into the middle of the tube, decurrent, shorter than the limb; anthers ovate, two-lobed, incumbent, attached by a hood at their base. *Pist.* Germen superior, stalked, oblong, with three angles, and three intermediate furrows; style vertical, awl-shaped; stigma simple. *Peric.* Capsule stalked, prismatic, of three cells, bursting at their inner angles. *Seeds* numerous, oval, inserted along the margins of each cell, imbricated, clothed with dense bristly hairs.

Effl. Ch. Corolla inferior, funnel-shaped, straight, with six marginal segments. Filaments inserted into the tube. Capsule stalked, prismatic, of three cells. Seeds numerous, imbricated, bristly.

1. *B. nobilis*. Scarlet Blandfordia. *Exot. Bot. t. 4. Br. n. 1. Ait. Epit. 364. Curt. Mag. t. 2003.*—"Bractæas but half the length of the partial stalks while in flower. Leaves narrow-linear." *Br.*—Native of the neighbourhood of Port Jackson. The root is woody and perennial. *Leaves* all radical, four or five inches long, scarcely half an inch broad, entire, smooth, coriaceous, tapering at the base into sheathing footstalks. *Flower-stalks* radical, two or three feet high, erect, round, each bearing a very handsome corymbose cluster, of drooping, scarlet flowers; yellow, and marked with green, at the border; each near an inch and a half long, on a red partial stalk of the same length, at whose base are two unequal, opposite, tapering bractæas. *Capsule* pointed, twice the length of the permanent withered corolla.

2. *B. grandiflora*. Large-flowered Blandfordia. *Br. n. 2. (Aletis punicea; Labill. Nov. Holl. v. 1. 85. t. 111.)*—Bractæas nearly as long as the partial stalks while in flower; the inner but one-third as large as the outer.—Observed at Port Jackson by Mr. Brown, who is not quite certain of Labillardiere's plant, found at Cape Van Diemen. We have seen neither, but we should scarcely have thought the latter could be distinguished even from *B. nobilis*.

BLANDFORDIA cordata, Andr. *Repos. t. 343.* See **GALAX**.

BLATTA, col. 2, l. 29, after *gigantea*, add—called in the West Indies *drummer*, from the noise it makes, like a smart knocking with the knuckle upon the waincot; l. 36, *dele* which see respectively.

BLAYNEY, BENJAMIN, D.D. in *Biography*, an eminent Hebrew scholar and critic, was educated at Oxford, and graduated M.A. in 1753, at Worcester college, and becoming afterwards fellow of Hertford college, took the degree of B.D. in 1768, and of D.D. in 1787, in which year he was appointed regius professor of Hebrew. As a Scripture commentator and translator, he acquired very considerable reputation. The publications by which he was distinguished were, "A Dissertation on Daniel's Prophecy of Seventy Weeks," &c. 1775, 4to.; "A New Translation

of Jeremial's Lamentations, with Notes, &c." 1784, 8vo.; "The Sign given to Ahaz, a Discourse on Isaiah, vii. 14—16," &c. 1786, 4to.; "Christ the greater Glory of the Temple," 1788, 4to.; "A New Translation of Zechariah, with Notes," &c. 1787, 4to. Dr. Blayney was canon of Christchurch, and rector of Potshot, where he died Sept. 20, 1801, having previously directed by will that his critical papers should be deposited in the library at Lambeth.

BLEACHING, col. 1, l. 19, r. For an account of the progress of discoveries in the new method of bleaching by the oxygenated muriatic acid, see *OXYMURIATIC Acid Gas*.

BLECHINGLEY, col. 2, l. ult. r. By the returns in 1811, the borough and parish contained 184 houses, and 1116 persons; 575 being males, and 541 females.

BLECHUM, in *Botany*, *βλεχων*, an old name for *Pulegium*, or Penny-royal, applied gratuitously by Dr. Patrick Browne to a Jamaica plant, and retained by Jussieu. It looks, rather than sounds, too much like *Blechnum*.—Brown Jam. 261. Juss. in Ann. du Mus. v. 9. 269. Brown in Ait. Hort. Kew. v. 4. 55.—Clas and order, *Didymia Angiosperma*. Nat. Ord. *Personata*, Linn. *Acanthi*, Juss. *Acanthaceae*, Brown.

Eff. Ch. Calyx in five deep equal segments. Corolla funnel-shaped. Capsule imperfectly two-celled, with two valves, and a contrary partition, at length separating in portions. Seeds several, with awl-shaped proprs. *Br*.

These characters exclude Jussieu's *B. angustifolium*, which, with *Ruellia imbricata* of Forskall, and several East Indian as well as tropical African species, compose Mr. Brown's new genus of *Aethiolum*, as yet, we believe, merely indicated in his Prodr. Nov. Holl. v. 1. 478. The following are the only species of *Blechnum* there mentioned.

1. *B. Brownei*. Dense-piked Blechnum. Juss. as above. Ait. n. 1. (*Ruellia Blechnum*; Linn. Sp. Pl. 884. Willd. Sp. Pl. v. 3. 362. Prunella elatior, flore albo; Sloane Jam. v. 1. 173. t. 109. F. 1.)—Leaves ovate-elliptical, slightly toothed. Spikes quadrangular. Bractees ovate, downy.—Native of the West Indies. Perennial. Herbaceous, decumbent, branched, two or three feet high, with opposite leaves, and white flowers of no great beauty.

2. *B. erectum*. Upright Blechnum. (*Ruellia blechoides*; Swartz Ind. Occ. 1068. Willd. Sp. Pl. v. 3. 362.)—Leaves oblong, somewhat toothed, smooth. Spikes ovate. Bractees nearly smooth.—Found in shady woods, in the western part of Jamaica. *Stem* erect, rather shrubby. *Flowers* blue. Willdenow misquotes the remarks of Swartz, which indeed are not very clearly expressed.

3. *B. angustifolium*. Narrow-leaved Blechnum. (*Ruellia angustifolia*; Swartz Ind. Occ. 1070. Willd. Sp. Pl. v. 3. 363.)—Leaves linear-lanceolate. Spikes oblong. Bractees ovate, hairy.—Native of the Caribbee islands. Herbaceous, a foot high, with tumid joints. *Leaves* smooth on both sides. *Flowers* small, blue.

BLETIA, so named by the authors of the Flora Peruviana, after Louis Blet, a Spanish apothecary, whose botanical merits ought to be very great, to entitle him to so fine, if really distinct, a genus.—"Ruiz et Pavon Prodr. 119." Brown in Ait. Hort. Kew. v. 5. 205. (Phaius; Loureir. Cochinch. 529.)—Clas and order, *Gynandria Monandria*. Nat. Ord. *Orchideae*.

Eff. Ch. Calyx and petals distinct. Lip sessile, hooded. Style unconnected. Anther a terminal deciduous lid. Masses of pollen eight or four, two-lobed.

1. *B. Tankervillei*. Lady Tankerville's Bletia. Ait. n. 1. Andr. Repof. t. 426. Curt. Mag. t. 1924. (*Li-*

modorum Tankerville; Redout. Liliac. t. 43. Schneev. Ic. t. 5. See *LIMODORUM* for more synonyms, and a description.)—Lip undivided, with a short spur. Leaves radical, elliptic-lanceolate.

2. *B. verecunda*. Tall Bletia. Ait. n. 2. (*Cymbidium verecundum*; Willd. Sp. Pl. v. 4. 105. *Limodorum altum*; Jacq. Ic. Rar. t. 602. Curt. Mag. t. 930.)—Petals converging. Lip without a spur; the ribs of its disk branched; middle lobe broader than long; lateral ones contracted upwards. Stalk more or less branched.—Native of the West Indies, long known in our foves. Stalk three feet high, with spreading branches. *Flowers* crimson, an inch broad. *Petals* forming a hood over the style. *Furrows* of the lip yellow.

3. *B. florida*. Purple Bletia. Ait. n. 2. (*Cymbidium floridum*; Salisb. Prodr. 9. *Limodorum purpureum*; Redout. Liliac. t. 83.)—Petals spreading. Lip without a spur; the ribs of its disk simple; middle lobe somewhat wedge-shaped; lateral ones dilated at the summit. Stalk somewhat branched.—Native of the warmest parts of the West Indies. Twelve or eighteen inches high. *Flowers* larger than the last, with more oblong, and more uniform, petals and calyx-leaves. Disk of the lip yellow.

4. *B. hyacinthina*. Hyacinthine Bletia. Ait. n. 4. (*Cymbidium hyacinthinum*; Sm. Exot. Bot. v. 1. 117. t. 60. Curt. Mag. t. 1492.)—Petals lanceolate, spreading. Lip without a spur. Masses of pollen four, two-lobed. Stem leafy. *Flowers* racemose.—Native of China, according to Mr. Ker. Of rather more humble growth than the last, from which it differs in having terminal, not radical, flower-stalks. The flowers too are a little larger, purplish rather than crimson. *Petals* and *calyx* exactly similar. Lip with four shallow curled lobes in front.

5. *B. capitata*. Capitate Bletia. Ait. n. 5.—"Lip without a spur; callous internally near the base. Stem leafy. *Flowers* capitate."—Native of the West Indies, from whence it was procured by sir Joseph Banks, in 1795. It flowers in the fove in June and July. We have seen no specimen nor figure.

Besides these garden species, and the original Peruvian ones, whatever they may be, there are doubtless several remaining latent in every good herbarium. We have some Nepal *Orchideae* from Dr. Buchanan, which may probably be referable to this genus.

BLETTERIE, l. 21, after Guyon, add—He also edited Mascler's Hebrew Grammar, vindicating his method in his "Vindiciæ Methodi Masclerianæ;" annexed to his edition of the Grammar in 1731.

BLIGHIA, in *Botany*, so named in honour of admiral William Bligh, whose services rendered to botanical science, in the transportation of rare plants from remote countries, have procured him this compliment, in common with the great captain Cook.—König in Ann. of Bot. v. 2. 569. Ait. Hort. Kew. v. 2. 350.—Clas and order, *Obandria Monogynia*. Nat. Ord. *Tribilata*, Linn. *Sapindi*, Juss.

Eff. Ch. Calyx in five deep segments. Petals five, with an internal appendage. Style none. Capsule superior, of three cells and three valves. Seeds solitary, each subtended by a large fleshy tunic.

1. *B. sapida*. Akee-tree. Ait. n. 1. König as above, 571. t. 16, 17. (Akee; Broughton Hort. East. 1792. 10. "Akefia africana; Tuffas Antill. 66. t. 3.")—Native of Africa, between the tropics, from whence it was transported to the West Indies in 1778. The fleshy tunic, or support, of the seed is said to be a delicate article of cookery, resembling the white flesh of a chicken or frog, like which it serves to make frittaffes for West Indian epicures. The

tree is large, of handsome growth, with abruptly pinnate, ample, smooth, entire leaves, and copious, small, white flowers, in compound, axillary panicles. Some flowers have imperfect stamens, others an abortive germen. *Nectary* a glandular notched ring, surrounding the base of the germen or its rudiment. *Capitule* elliptic-oblong, three-lobed, fleshy, variegated with red and yellow, about the size of a goose egg. *Seeds* globular, as big as cherries, dark brown, polished, each half sunk in a white, turbinate, lobed and corrugated tunic, of the substance of firm suet, larger than the seed, and attached laterally to the central partition of each valve.

BLIGHT, l. 25, add—See APHIS.

BLISTERS, *Fluid of*, in *Chemistry*. See FLUIDS, *Animal*.

BLOCKLEY. Add—It contains 1618 inhabitants.

BLOOD, *Chemical Properties of*. The chemical properties of the blood have been lately investigated with considerable success by Drs. Marcet and Boftock, Brande, Berzelius, and others; with a summary view of whose experiments we shall here present our readers.

Of the serum.—The specific gravity of the serum of blood has been stated to lie between 1028 and 1029.5. The opinion of De Haen that it contains gelatine, was first shewn to be erroneous by Dr. Boftock in this country, and about the same time by Berzelius in Sweden. The principle formerly termed gelatine has been variously represented and named by different chemists. Thus Dr. Boftock endeavoured to prove that it was a species of mucus, Mr. Brande that it was merely an alkaline solution of albumen; Dr. Marcet terms it *mucro-extractive* matter, Dr. Pearson an *animal oxyd*, the French chemists *ozmazome*, &c.; but it is to Berzelius that we owe the knowledge of its real nature. We infer, nearly in his own words, the following account of his analysis of the serum of the blood, as an excellent model for the analysis of all albuminous fluids.

One thousand parts of serum were evaporated to dryness till it could be easily reduced to powder. In this state the residuum weighed 95 parts, and consisted of a yellowish semi-transparent mass, resembling amber. "Of this mass," says he, "I digested 10 grammes in cold water. The albuminous portion became softened and gelatinous. I separated by the filter the liquid from the insoluble part, and washed the latter repeatedly in boiling water. The undissolved albumen dried on the filter weighed 6.47 grammes, and did not give up its earthy phosphate by subsequent digestion in muriatic acid.

"The solution which passed the filter was evaporated to dryness, during which thick membranes formed at the surface of the solution, and the solution gelatinized before it was perfectly dry. I digested this residue in alcohol whilst it was still gelatinous; the spirit assumed a yellow colour, and on evaporation left an alkaline deliquescent mass, weighing .92 grammes. This consisted of soda holding albumen in solution, of muriate of soda and muriate of potash, of lactate of soda, and of an animal matter which always accompanies the lactate. This animal matter has a brownish-yellow colour, is easily soluble both in water and alcohol, and is precipitated by tannin and submuriate of lead. It is constantly formed, as has been stated, in conjunction with the lactic acid only; and its presence may be taken as a sure indication of the presence of that acid.

"The portion not dissolved by alcohol, when digested with water, left a fresh residue of albumen, weighing 1.95 grammes. The watery solution could not be made to gelatinize, and did not contain the smallest quantity of gelatine. Besides

the alkali, it contained an animal matter, easily precipitated by tannin and by oxymuriate of mercury, and which appeared to me to be extracted from the albumen by the boiling of the water, and to be analogous to the substance obtained by boiling fibrin in water." See FIBRIN.

Berzelius found only a slight trace of the phosphoric acid, and none of the sulphuric in the serum of ox blood; 1000 parts of which, according to him, consist of

Water	-	-	-	-	-	995
Albumen	-	-	-	-	-	79.99
Substances soluble in alcohol,	}	viz. lactate of soda, and ex-	}	6.175	}	8.74
tractive matter						
Muriate of soda and potash	-	-	-	2.565	-	-
Soda and animal matter only soluble in	}	water	}	-	}	1.52
water						
Loss	-	-	-	-	-	4.75
						1000

One thousand parts of the serum of human blood consist of,

According to Berzelius,						
Water	-	-	-	-	-	995.0
Albumen	-	-	-	-	-	80.0
Substances soluble in alcohol, viz. muriate	}	of potash and soda	}	6	}	10.0
Lactate of soda and animal matter						
Substances soluble in water, viz. soda,	}	phosphate of soda, and a little animal	}	-	}	4.1
matter						
Loss	-	-	-	-	-	.9
						1000

According to Marcet.						
Water	-	-	-	-	-	999.0
Albumen	-	-	-	-	-	86.8
Muriate of potash and soda	-	-	-	-	-	6.6
Mucro-extractive matter	-	-	-	-	-	4.0
Subcarbonate of soda	-	-	-	-	-	1.65
Sulphate of potash	-	-	-	-	-	.35
Earthy phosphates	-	-	-	-	-	.60
						1000

Berzelius remarks on Dr. Marcet's analysis, "A more perfect agreement cannot be expected in the analysis of substances so liable to incidental differences, particularly in the quantity of water, which in the blood depends so much on the proportion of liquid taken into the stomach. It is clear that Dr. Marcet's *extractive matter* is impure lactate of soda; and I must also observe, that the sulphate of potash and earthy phosphates found by him in the ashes of serum are probably, for the reasons above-mentioned, formed by the products of combustion." See ALBUMEN.

Of the colouring matter or red particles of the blood.—An opinion long prevailed among chemists, that blood owed its red colour to iron. Bada appears to have been the first who pointed out the existence of this metal in blood; but its presence was more satisfactorily demonstrated by Menghini, whose experiments were repeated and verified by subsequent

requent chemists. Parmentier and Deyeux supposed, that the red colour depended upon the union of iron with the oxygen contained in the blood; Fourcroy and Vauquelin, who succeeded, denied this, and asserted that it depended upon the subphosphate of that metal. Dr. Wells, however, so long ago as the year 1797, called this opinion in question, and asserted that the most delicate tests of iron did not indicate the presence of that metal in the blood; that other red substances do not all contain iron; and that, on the other hand, other substances that do contain iron are not red. Hence he supposed, that the red part of the blood was an organized animal substance. This opinion has been lately revived by an eminent modern chemist, Mr. Brande; who asserts, contrary to almost every other chemist, that the colouring matter of the blood yields no more iron when burnt than any other constituent of the blood, and that consequently it cannot owe its colour to that principle. Berzelius, however, though he denies the opinion of Fourcroy and Vauquelin, that the red colour depends upon a salt of iron, agrees with most preceding chemists, that its ashes contain much more of this metal than those of either its other constituents, that is to say, that they contain 50 per cent. of oxyd of iron, while the ashes of albumen and fibrin do not yield a trace of that metal. Hence he concludes, that iron, somehow or other, and in a manner unknown to us at present, probably conduces to the colour of the blood. The opinion of Berzelius, and most modern chemists, respecting this principle is, that it closely resembles albumen and fibrin in its properties. According to Berzelius, the mineral acids act upon it nearly in the same manner as upon albumen. It is soluble also in dilute acetic acid, and precipitated by the sulphate of potash, like that principle; and hence Berzelius is inclined to consider it as a modification of albumen. Vauquelin has lately given a method by which he thinks the colouring principle may be separated from the other principles of the blood, which is a very difficult task; we do not think, however, that he has been successful.

Mr. Brande tried to form a lake, by precipitating its acid solution by means of different earthy and metallic salts. Neither alumina nor oxyd of tin answered the purpose well. Corrosive sublimate or nitrate of mercury succeeded best. These gradually precipitated the colouring matter, and formed with it powders of a good red colour, not altered by exposure to the air. Mr. B. likewise made some attempts to employ it as a principle in dyeing, but they were not attended with much success.

Some interesting observations have lately been made on the size of the colouring particles of the blood by Dr. Young. According to this gentleman, they bear no proportion to the size of the animal. Thus,

The particles of bullock's blood from	}	0 0 0 0	inch
beef measured - - - - -			
Ditto of a mouse - - - - -	}	1	to 1/2 1/2
Do. of human blood - - - - -			
Do. of blood recently diluted from	}	1	to 1/2 1/2
swine - - - - -			
Do. of the skate, about - - - - -	}	1	to 1/2 1/2

Of the Fibrin.—The experiments of Berzelius shew that this substance closely resembles albumen in its chemical properties. We do not think it necessary therefore to add any thing on the subject here, but refer our readers to the article ALBUMEN. The physical properties of fibrin have been already described under BLOOD in the Cyclopædia. Ac-

According to the experiments of Gay Lussac and Thenard, fibrin is composed of

Hydrogen - - - - -	7.021
Carbon - - - - -	53.360
Oxygen - - - - -	19.685
Azote - - - - -	19.934
	100

The buffy coat of blood is fibrin.

Of the Serosity.—This term has been generally applied to the fluids and animal matters existing in the serum of the blood, with the albuminous principle. See the description of serum in the present article.

With respect to the blood as a whole, little has been added to our knowledge. M. Vogel has attempted to shew, that when placed in the vacuum of an air-pump, it gives out a considerable quantity of carbonic acid: and Dr. Gordon has asserted, that during its spontaneous coagulation heat is emitted; but this has been denied by other observers, and especially by Dr. J. Davy.

The blood of other animals, and the blood of persons labouring under different diseases, have been but little examined; indeed this extensive and important field of chemical investigation is almost entirely unexplored.

BLOOM, in *Geography*, a township of Pennsylvania, in Northumberland county, having 1285 inhabitants.—Also, a township of the county of Fairfield, in the district of Ohio, having 839 inhabitants.

BLOOMFIELD. Add—Also, a township of Pennsylvania, in Crawford county, having 114 inhabitants.

BLOUNT, l. 1, insert—East Tennessee. Add—containing 8839 inhabitants, of whom 805 are slaves.—Also, a county of the same state, having 3259 inhabitants, including 206 slaves.

BLOW-PIPE. We think it proper to notice here the important modification of this useful instrument, lately contrived by Mr. Brooke, and which, by the intensity of the heat it excites, has produced such interesting results in the hands of different experimentalists, and more especially of Dr. Clarke of Cambridge.

Mr. Brooke's blow-pipe consists merely of a strong copper or iron air-tight box, to which are adapted a condensing syringe and jet-pipe, furnished with a stop-cock. When used, the box is to be filled with condensed air by means of the syringe; the stop-cock is then to be turned, and the condensed air permitted to escape through the jet. From the smallness of the aperture of the jet, a constant and uniform blast is thus kept up for a considerable time, (and by the occasional use of the syringe, may be continued for any length of time whatever,) simply by means of the elasticity of the air itself.

A great advantage attending the use of this blow-pipe is, that the box can be readily filled with any gas, or mixture of gases, we choose. Accordingly advantage was soon taken of this property, and a mixture of oxygen and hydrogen gases, when inflamed as they issued from the jet, was found to yield a more intense heat than any other. From the liability, however, of this mixture to explode, great caution was required in using it, and this led to the necessity of some contrivance for obviating this dangerous circumstance. Various means were soon suggested, most of which were founded on the principle recently discovered by sir H. Davy, that the inflammation of gases will not pass through minute apertures (see WIRE-GAUZE): and, at length, we believe

the instrument has been rendered quite safe; and, in this state, may be obtained of any of the philosophical instrument makers.

The public attention was particularly excited towards this instrument by the experiments of Dr. Clarke, who supposed that by its means, and the employment of the gaseous compound above-mentioned, he had succeeded in reducing some of the most refractory metallic oxids and ores. The accuracy of many of Dr. C.'s results has indeed been since called in question; but they nevertheless demonstrate the extraordinary powers and valuable properties of this modification of the blow-pipe.

BLUEHILL, l. 4, r. 658.

BLUE-WATER RIVER, a river of America, which rises among the southern branches of Dock river, and empties into the Tennessee.

BLUFF, a term used in N.W. America to denote a particular tract of land. The alluvion of the rivers W. of the Alleghenies is considerably lower than the surrounding country, and is of a breadth corresponding to the magnitude of the rivers; that of the Missouri is from 2 to 6 or 8 miles in breadth, and is for the most part from 150 to 300 feet below the general level of the country. The ascent from this valley into the country is precipitous, and is called "the bluff;" and may consist of rock or clay. Between these bluffs, the river runs in a very crooked channel, and is perpetually changing its bed, and the permanent beds are called the bluffs.

BOA, col. 3, l. 27, for CONSTRUCTOR *r.* SERPENS.

BOARD of Agriculture. See SOCIETY.

BOARDMAN, in Geography, a township of Ohio, in the county of Trumbull, containing 343 inhabitants.

BOCCA, a term used both in the Levant and on the N. coast of South America, on the Spanish Main, for a mouth or channel into any port or harbour; or the entrance into a foud which has a passage out by a contrary way.

BOCKFIELD, a town of the district of Maine, in the county of Oxford, containing 1251 inhabitants.

BODMIN, l. ult. r. In 1811, the parish and borough contained 315 houses, and 2383 persons; 158 in the parish and 1008 in the borough being males, and in the former 175 and in the latter 1042 females.

BOEBERA, in Botany, so named by Willdenow, in compliment to a Russian botanist, of the equestrian order.—Willd. Sp. Pl. v. 3, p. 2126. Pursh 559.—Class and order, *Syngenesia Polygamia-superflua*. Nat. Ord. *Compositæ*, Linn. *Corymbifera*, Juss.

Eff. Ch. Receptacle naked. Seed-down of simple hairs. Calyx double; the inner of eight leaves; outer of many.

1. *B. corymbifera*. Dwarf Boebera. Willd. n. 1. Pursh n. 1. (*Tagetes papposa*; Michaux Boreal-Amer. v. 2. 132. Vent. Hort. Cels. t. 36. *Dysflodia glandulosa*; Cavan. Leccion. 202.)—Native of the overflowed banks of the Missouri and Mississippi, annual, flowering in August and September. *Pursh*. A branched herb, twelve or eighteen inches high, with the habit of an *Antennaria*, besprinkled with glandular pellucid dots, full of a foetid bitter fluid. *Flowers* of a golden yellow, with eight small rays. *Leaves* pinnate, toothed, narrow. Cavanilles says this plant grows in every part of America, but especially in the kingdom of Santa Fé, where it is commonly called *Ruda*, on account of its offensive smell. Venterat speaks of it as a vermifuge, and as affording a tolerably durable yellow dye.

BOERO, *del.*

BOEUF, *Rivière aux*, or *Ox River*, in Geography, is the last and largest branch of Ouachitta. It rises in the

angle formed between the Missouri and Arkansaw, and pursues a course to the S.W. for some distance, then turning fourthward for 70 or 80 miles, enters the state of Louisiana, and afterwards, at a short distance, crosses the N.E. line of Baitrop's grant, pursues a S.W. course, and then resumes its direction to the southward, and after running about 60 miles enters Ouachitta, above the west point of the island of Sicily. The Boeuf, from its source in the Arkansaw lake to the boundary of the state of Louisiana, is about 120 miles, and from thence to its mouth nearly the same distance, producing a length of 240 miles, independently of its windings. It is navigable as far as Prairie Mer Rouge. A strong brake of cane skirts the Boeuf nearly along its whole course, through the state of Louisiana. Much land near its banks might be cultivated, but is mostly subject to casual inundation.

BOGAERT, l. 3, r. the Netherlands.

BOILING, col. 4, l. 10, after process, add—Under the ordinary pressure of the atmosphere, with due allowance for its variable density, water does not boil till it is heated to 212° Fahrenheit. However Sir George Shuckburgh found, that when the barometer was at 26 inches, water boiled at less than 205°; but when it was at 31 inches it required before it would boil a heat of nearly 214°. Under the common pressure of the atmosphere, ether boils at 98°; alcohol at 176°; water at 212°; nitric acid at 248°; sulphuric acid at 546°; phosphorus at 554°; and mercury and linseed-oil at 600°. From the experiments of Dr. Black upon several liquids in vacuo, it appears that, in general, they all boiled with about 140 degrees of heat less than when sustaining the weight of the atmosphere. Vitriolic ether, if the pressure of the atmosphere be removed, will boil when 52 degrees below the cold sufficient for freezing water.

BOISSEAU, a measure for corn, according to the old system in France, which varies much in different parts of the country.

BOLAX, in Botany, a name of Commerçon's adopted by Jussieu, *Bolax* means a *clod*, or *lump of earth*, which this dwarf umbelliferous genus does not ill resemble.—Juss. Gen. 226. Sprengel Prodr. Umbellif. 33. Spec. Umb. 9. (See CHAMITIS.)—The species, though not numerous, are far from being, as yet, accurately determined, either with respect to their permanent differences, or their synonyms.

BOLINGBROKE, l. ult. for 72 r. 74; and for 283 r. 361.

BOLINGBROKE, Lord. See ST. JOHN.

BOLIN-GREEN, in Geography, a town of Kentucky, in Warren county, containing 154 inhabitants, of whom 51 are slaves.

BOLL, a corn measure in Scotland, containing 4 firlots, each firlot being = 4 pecks; and 16 bolls = 1 chaldron.

BOLOGNINO, a copper coin at Bologna and its neighbourhood.

BOLSOVER, l. ult. for 435 r. 244; and for 1091 r. 1043.

BOLTON, in America, l. 3, r. 249; l. 6, add—containing 700 inhabitants; l. 8, for 861 r. 1037.

BOLTON-*le-Moors*, l. 30, add—In 1811, the township of Great Bolton contained 3120 houses, and 17,070 persons; 7988 being males, and 9082 females. Little Bolton township had 1286 houses, and 7079 inhabitants; 3366 being males, and 3713 females.

BONAVENTURA, l. 2, r. Popayan.

BONDS, INDIA, bonds issued by the East India company of 50l. and 100l. each, bearing interest of 5 per cent.

per annum, which interest is paid at the India-house in London.

BOND, *Post-Obit*, a bond payable after the death of the person whose name is therein specified.

BONES, *Analysis of*, in *Chemistry*. The analysis of bones was omitted under **BONE**, but will be found under **TEETH**, contrasted with the analysis of the teeth.

VOL. V.

BOONE, in *Geography*, a county of Kentucky, containing 3668 inhabitants, of whom 656 are slaves.

BOONSBOROUGH, l. 2, r. Madison; and at the close add—It contains 68 inhabitants, 15 being slaves.

BOOROOJIRD, a flourishing city of Persia, in the province of Irak, the capital of a wealthy district, subject to the prince, Mahomed Tukkee Mirza, and containing a population of 12,000 souls. The district attached to its government is peopled by the tribe of Lack, who do not wander far from the spot to which they are partial, but settle in villages, and employ themselves in the improvement of their estates.

BOOTH BAY, l. 5, r. 1582.

BORACITE. See *MINERALOGY*, *Addenda*.

BORAX, in *Chemistry*. See **BORON**, *infra*.

BORBI, or **BURBI**, in *Commerce*, a copper coin in Egypt, 8 borbi being = 6 forli = 3 aspers = a medino, and 40 medini = a piastre current.

BORELLI, col. 2, l. 6, r. 1670.

BORON, or **BORACIUM**, in *Chemistry*, the peculiar elementary basis of *boracic acid*. Sir H. Davy, in 1807, first decomposed boracic acid, and obtained this principle by the agency of galvanism. Soon afterwards another method of obtaining it was pointed out by Gay Lussac and Thénard, by means of potassium, which was soon verified by Davy and others. One part of pure boracic acid, previously melted and reduced to powder, is to be mixed with two parts of potassium, and the mixture put into a copper or iron tube and gradually heated till it is slightly red, and kept in that state for some minutes. At the temperature of 300° the decomposition begins, and the mixture becomes intensely red hot, as may be perceived by making the experiment in a glass tube. When the tube is cold, the matter in it is to be washed out with water, the potash formed is to be neutralized with muriatic acid, and the whole thrown upon a filter. It may be washed and dried at a moderate heat.

Boron thus obtained is a powder of an olive-brown colour, without either taste or smell. In close vessels, it may be exposed to the most violent heat without being altered, or undergoing any other change than an increase of density. Its specific gravity, before being heated, is less than 1.84, but afterwards greater. It is insoluble in water, alcohol, ether, and oils, whether cold or hot. It does not decompose water even when heated in that fluid. It is a non-conductor of electricity. It undergoes no change when exposed to common air or oxygen at low temperatures; but when heated to about 600° it takes fire, and burns with great splendour; and at the same time absorbs oxygen, and is partly converted into boracic acid. The combustion, however, is soon stopped, from the coating of the boracic acid formed, which prevents the contact of the oxygen. Hence this requires to be frequently removed, by washing, before the whole of the boron can be burnt. The nitric acid also readily converts boron into boracic acid. Boron, heated with most of the neutral salts, deprives their acids of the oxygen which they contain; thus, when heated in close vessels with sulphate or sulphite of soda, borate of soda and

fulphur are formed. When heated with nitre or oxymuriate of potash, much deflagration ensues, and borate of potash is produced: so also the carbonate of soda is converted into borate of soda and charcoal.

There is considerable difficulty in fixing the proportion of oxygen with which boron combines to form boracic acid, as the results of Gay Lussac, Davy, and others, differ very much. Dr. Thomson, guided partly by these experiments, but chiefly by the analysis of borate of ammonia by Berzelius, fixes the weight of the atom of boron at 6.6, and supposes it combines with two atoms of oxygen to form boracic acid. Upon this supposition, 100 parts of boron will combine with 300 of oxygen.

Boron, when heated in chlorine, takes fire, and burns with a brilliant white flame. A white substance coats the vessel in which the experiment is made, and the boron is also covered with a white substance, which by washing is converted into boracic acid. It is probable that this white substance is a chloride of boron, but it has not been much examined.

Boron combines with *fluorine*, (see **FLUORINE**), and forms with it a powerful acid, which has been named *fluoboracic acid*, (See **FLUOBORACIC ACID**.) It also appears, according to the experiments of Gmelin, to combine with hydrogen. Descotils has likewise shewn that it combines with iron, and Davy with potassium; but, as far as it is known, it combines with no other metal. With respect to the nature of this singular substance it may be proper to mention, that some consider the boron described above to be an oxyd of a metallic basis, to which the name of *boracium* has been given.

BORONIA, in *Botany*. (See **RUTACEÆ**.) Mr. Brown, who could not but be aware of the ill-defined limits of this order, as originally constituted by Jussieu, has, in his General Remarks on the Botany of Terra Australis, 13, proposed to remove the 1st section, under the appellation of *Zygophyllæ*, naming the remainder *Diofinez*, the genus *Ruta* not being a good type of the order, so limited. This learned Australian botanist informs us that near 70 species have been observed, the greater part of them referable to our *Boronia*, *Correa*, *Eriostemon*, and *Zieria*, (as also we presume to *Croceæ*), and to *Phebalium* of Ventenat. "Of these genera *Boronia* is both the most extensive and the most widely diffused, existing within the tropic, and extending to the south end of Van Diemen's island. Like the others, however, its maximum is in the principal parallel, at both extremities of which it is equally abundant."

BOROUGH, col. 3, l. 19 from the bottom, after London, r. by a writ bearing date the 12th of December, 1264, in the 49th year of the reign of Henry III.

BOROUGH-BRIDGE, l. 23, r. The borough and township of Borough-bridge contain 131 houses, and 747 inhabitants; 373 being males, and 374 females.

BORRAGINEÆ, in *Botany*, the 42d order in Jussieu's system, the 9th of his 8th class; for whose characters, see **GENTIANÆ**.

This order, equivalent to the Linnæan **ASPERIFOLIÆ**, (see that article,) is thus characterized.

Calyx in five deep segments, permanent. *Corolla* mostly regular. *Stamens* generally five. *Germen* either simple or four-lobed; style one; stigma either cloven, or furrowed, or simple. *Seeds* generally four; sometimes enclosed in a capsular or pulpy feed-vessel; sometimes naked, obliquely attached to the bottom of the style, and for the most part surrounded by the permanent calyx. *Coraculum* without albumen. *Stem* in the greater number herbaceous; in a

few shrubby or arboreous. *Leaves* alternate, often harsh or rough.

SECT. 1. *Fruit* pulpy. Stem shrubby or arboreous.

Patagonula, Cordia, Ehretia, Menais, Varronia, and Tournefortia.

SECT. 2. *Fruit* of one or two capsules.

Hydrophyllum, Phacelia of Jusseu, *Ellisia, Dichondra, Messerschmidia, and Cerinthe.* DICHONDRA (see that article) is erroneously placed here.

SECT. 3. *Fruit* of four naked seeds. *Throat* of the corolla naked. Plants mostly herbaceous and rough.

Coldenia, Heliotropium, Ecbium, Lithospermum, Pulmonaria, and Onofina.

SECT. 4. *Fruit* of four naked seeds. *Throat* of the corolla furnished with free scales, hollow like spurs, slightly projecting out of the corolla, at the base of its segments, gaping above. Herbs generally with rough leaves.

Symphytium, Lycopsis, Myosotis, Anchusa, Borago, Asperugo, and Cynoglossum.

SECT. 5. *Genera* allied to the Borragineæ.

Nolana, Siphonanthus, and Falkia.

BORRERA, is dedicated by professor Acharius, to the honour of Mr. William Borrer, F.L.S., one of the most eminent British cryptogamists, whose studies have been particularly directed to the Lichen tribe, and who is also critically versed, as well as singularly accurate, in every department of British botany.—Achar. Lichenogr. 93. t. 9. f. 3—9. Syn. 220. Sm. Prodr. Fl. Græc. Sibth. v. 2. 313.—Clas and order, *Cryptogamia Algae.* Nat. Ord. *Lichenes.*

EFF. CH. Shields stalked, coloured, with an elevated, inflexed border, of the substance of the leafy, cartilaginous, elevated, linear frond.

This genus is very natural in habit, comprising the well-known *Lichen ciliaris* of Linnaeus and its allies. Acharius defines seventeen species, among which several are very elegant, such as *B. Trulla* from Peru, figured in Ach. Meth. t. 4. f. 6; *leucomela*, (see Engl. Bot. t. 2548), and *chrysophthalmia*, t. 1088.

We have ventured in Prodr. Fl. Græc. to remove hither the *Evernia prunastri*, Ach. Syn. 245, *Lichen prunastri* of Linnaeus; and feel much inclined to associate the whole of that genus with *Borrera*, there being only two species besides, which are *Lichen divaricatus* and *vulpinus* of Linnaeus. We really cannot perceive any distinctive character to keep *Evernia* separate.

BORROWSTONNESS. Add.—The parish contains 352 houses, and 2704 inhabitants; 1102 being males, and 1602 females.

BORYA, in *Botany*, a New Holland genus, thus named by M. Labillardiere, in honour of the distinguished botanical traveller, M. Bory de St. Vincent. This genus was first made public by its author in 1804. A year or two afterwards, professor Willdenow published a different *Borya*, in his Sp. Pl. v. 4. 711. The former is adopted, in his *Prodromus*, by Mr. Brown, who, nevertheless, has admitted the latter into Ait. Hort. Kew. v. 5. 365. This can only have arisen from the professed plan of the Hort. Kew. being in general to copy Willdenow, and we trust Mr. Brown no more intended to give his sanction to this error, than to the adoption of *ARAUCARIA*, to the prejudice of the rightful *DOMBEYA*. (See those articles.) However that may be, we feel it incumbent on us to admit the original *Borya*, against which no valid objection can be raised, having already endeavoured to find a suitable name (see *BIGELOVIA*) for the other.—Labill. Nov. Holl. v. 1. 81. Brown Prodr. Nov. Holl. v. 1. 286.—Clas

and order, *Hexandria Monogynia.* Nat. Ord. *Asphodelææ*, Brown.

EFF. CH. Spatha of two unequal sheathing, permanent valves. Corolla of one petal, funnel-shaped, withering; limb in six deep equal segments. Stamens inserted into its contracted throat. Style thread-shaped. Stigma obtuse. Capsule superior, of three cells, and three valves, with central partitions. Seeds several.

Mr. Brown conceives the present genus to be not very nearly related to any, except perhaps *XANTHORRHOEA*, (see that article), and his own *Johnsonia*. In habit it approaches some of the *Junceæ*, but differs in the black crustaceous integument of the seed, and in the soft, fleshy, somewhat oily, albumen.

It consists of perennial herbs, of a harsh dry texture. *Roots* composed of long, tough, somewhat shining fibres. *Stems* either simple, or divided and creeping, clothed with very crowded, acroste, pointed leaves; dilated and half-sheathing at their base. *Flower-stalks* solitary, terminal, simple. *Head* nearly globular, encompassed with a few short leafy bractæ. Scales of the calyx smooth, membranous, the outer one sheathing the inner, which is narrower, and embraces the tube of the corolla.

1. *B. nitida.* Shining *Borya*. Labill. Nov. Holl. v. 1. 81. t. 107. Br. n. 1.—Stem much branched, taking root below, with simple polished fibres. Flower-stalks shorter than the ascending branches. Head ovate.—Gathered by both the distinguished botanists above cited, on the fourth coasts of New Holland, and the adjacent islands, in sandy ground. The plant is about a span high, and, except the want of downy radicles, seems calculated to confine the blowing sands of its dreary country, like our *Carex arenaria, Elymus arenarius, &c.*

2. *B. sphaerocephala.* Round-headed *Borya*. Br. n. 2.—Stems simple, nearly erect, shorter than the flower-stalks. Head globose.—Gathered by Mr. Brown, in the same neighbourhood.

BOS, in *Zoology*, l. 13, after *ferus*, insert — See *Urus*.

BOSCAWEN, l. 4. r. 1829.

BOSSLEA, in *Botany*, a fine papilionaceous genus, consecrated by Ventenat, to the memory of his countryman M. Boissieu-Lamartinière, who accompanied La Pérouse in his voyage round the world, the account of which, published at Paris, attests the merit of this unfortunate botanist.—Venten. Jard. de Cels 7. Willd. Sp. Pl. v. 3. 972. Sm. Tr. of Linn. Soc. v. 9. 302. Brown in Ait. Hort. Kew. v. 4. 266.—Clas and order, *Diadelphia Decandaria.* Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, coriaceous, bell-shaped, two-lipped; upper lip largest, in two rounded, obtuse segments; lower in three deep, lanceolate, equal segments. *Cor.* papilionaceous. Standard heart-shaped, ascending, twice as long as the upper lip of the calyx, with a linear, convex claw. Wings half the length of the standard, obovate, each with a tooth at one side. Keel the length of the wings, of two hatchet-shaped, concave, converging petals, each with a lateral tooth, and a prominence on the disk, near the base. *Stam.* Filaments ten, united about half way into one set, separate only along the upper edge; anthers uniform, simple, roundish. *Pysl.* Germen stalked, linear, compressed; style recurved; stigma simple. *Peric.* Legume stalked, oblong, compressed, nearly flat; its valves rigid, thickened at each margin; sometimes internally spongy, and of many cells. *Seeds* several, oval, compressed, stalked, each with a tumid appendage.

Eff. Ch. Calyx two-lipped; upper lip largest, cloven, obtuse. Stamens all connected. Legume stalked, compressed, thickened at each edge, with many seeds.

1. *B. scolopendria*. Yellow Flat Boffizea, or Plank-plant. Sm. as above n. 2. Sims in Curt. Mag. t. 1235. (*B. Scolopendrium*; Br. in Ait. n. 1. *Platylobium scolopendrium*; Andr. Repof. t. 191. *P. scolopendrium*; Ven. Malmaif. t. 55.)—Branches compressed, winged, toothed, leaflets; flowering at the teeth. Stem erect. Keel naked. Upper bractæas permanent, imbricated, equal to the footstalk. Calyx very smooth.—Native of New South Wales, from whence it was introduced, in 1792, by Lee and Kennedy. A green-house shrub, flowering early in summer. The winged branches, in a manner proliferous, and bearing handsome, red and yellow, stalked, solitary flowers, from their numerous alternate teeth, give this shrub a very singular aspect. The seedling plants only bear simple, alternate, stalked, ovate, entire leaves. The legume of this species, (and perhaps the following,) is said by Dr. Sims to want that internal sponginess, which, in those first described by botanists, seemed to yield a good generic character. The texture of the legume, its thick edges, and the want of a dorsal membranous wing, are still abundantly sufficient to keep the genus distinct from *PLATYLOBIUM*. (See that article.) With respect to the specific name, we must beg leave, like Ventenat and Sims, to consider it as an adjective, comparing this singular plant's branches to the insect called a *Scolopendra*, or Centipede. It has no connection with the vegetable genus *Scolopendrium*, and still less has it ever been so called.

2. *B. rufi*. Red Flat Boffizea. Br. in Ait. n. 2.—“Branches compressed, winged, toothed, leaflets; flowering at the teeth. Keel fringed. Upper bractæas deciduous, remote from the lower. Calyx very smooth.”—Gathered by Mr. Brown on the south-west coast of New Holland. Sent to Kew, by Mr. Good, in 1803. A green-house shrub, flowering from June to September.

3. *B. heterophylla*. Various leaved Boffizea. Venten. Jard. de Cels t. 7. Willd. n. 1. Sm. n. 1. Br. in Ait. n. 3. (*B. lanceolata*; Curt. Mag. t. 1144. *Platylobium lanceolatum*; Andr. Repof. t. 205. *P. ovatum*; *ibid.* t. 266, (not 276,) according to Mr. Brown.)—Branches leafy, compressed. Leaves elliptical, obovate, or linear, flat. Legume of many cells, with spongy partitions.—Native of New South Wales. Imported by Lee and Kennedy in 1792. A branched bushy shrub, flowering most part of the summer. The branches, though nearly flat, are not dilated like the foregoing, nor are they either toothed, or denudated. The leaves are variable in figure, but on full-grown plants usually linear, alternate, on short stalks. Flowers axillary, solitary, stalked, large, yellow with a crimson keel, very ornamental.

4. *B. linophylla*. Narrow-leaved Boffizea. Br. in Ait. n. 4.—“Branches leafy, compressed. Leaves linear; recurved at the margin. Legume of one cell.”—Observed by Mr. Brown, on the south-west coast of New Holland. Sent by Mr. Good to Kew, in 1803, where it is said to flower from July to September.

5. *B. prostrata*. Procurrent Boffizea. Br. in Ait. n. 5. (*B. ovata*; Sm. n. 3, excluding the synonymas.)—Branches round, leafy. Stem procurrent. Leaves oval, smooth. Stipulas shorter than the footstalks. Legume of a single cell.—Sent from Port Jackson, by Dr. White, in 1793. Mr. Good is mentioned as having sent it to Kew in 1803. The stems are a span long. Leaves nearly uniform, a quarter of an inch long, their edges thickened, wavy, and somewhat crenate. We had mistaken this for the *Platy-*

lobium ovatum of Andrews, t. 266, but Mr. Brown has convinced us of our error.

6. *B. cinerea*. Downy Sharp-leaved Boffizea. Br. in Ait. n. 6.—“Branches round, leafy. Stem erect, much branched. Leaves ovato-lanceolate; rough above; downy beneath; recurved at the margin.”—Found by Mr. Brown in Van Diemen's island, and sent in 1805 to Kew, where it flowers from May to July.

7. *B. microphylla*. Little-heart-leaved Boffizea. Sm. n. 5. Br. in Ait. n. 7. (*Platylobium microphyllum*; Sims in Curt. Mag. t. 863.)—Branches round, leafy, spinous-pointed. Leaves inversely-heart-shaped, or wedge-shaped.—Native of New South Wales, from whence Dr. White sent us specimens in 1793. Mr. Calcy sent seeds to Sir Joseph Banks in 1803. This species is said to have flowered at the present duke of Marlborough's, at White Knights, in 1805. The flowers, though smaller than in some other species, are so numerous, and so prettily variegated with yellow, purple, and red, as to render this a very ornamental plant. The leaves are shorter than the flowers, veiny, smooth and entire, very abundant. The tips of the branches finally become spinous.

Mr. Brown is probably furnished with more species of this handsome genus, which have not yet made their appearance in the gardens.

BOSSENEY. Add—The parish of Tintagel, in which this borough is situated, contained, in 1811, 141 houses, and 730 persons; 339 being males, and 391 females.

BOSTANA. See **BENTIAN**.

BOSTON. At the close, *r.* the parish of Boston, in 1811, contained 1772 houses, and 8180 persons; 3805 being males, and 4375 females.

BOSTON, in Massachusetts, l. 17, after augmented, inserted—By the census of 1810, Boston, Chelsea, and the islands within and without the jurisdiction of Boston, included a population of 34,381 souls. The former islands are, Noodle's, Hog, Apple, Deer, Long, Spectacle, Governor's including Fort Warren, and Fort Independence; the latter are, Greene, Thompson's, Rainford's, George's, Great Brewster, Outer Brewster, Lighthouse, and Calfishland. Boston itself is stated as containing 33,250 inhabitants.

BOSTON, a town of the district of Ohio, in the county of Champaign, having 616 inhabitants.

BOSTON, New, l. 12, for 1202 *r.* 1610.

BOSWELLIA, in *Botany*, “in memory of the late Dr. John Boswell, of Edinburgh.”—Roxb. Coromand. v. 3, 4.—Class and order, *Decandria Monogynia*. Nat. Ord. *Melisi*, Juss. *affine*.

Eff. Ch. Calyx inferior, five-toothed. Petals five. Nectary a crenate ring surrounding the base of the germen. Capsule triangular, of three cells and three valves. Seeds solitary, winged.

1. *B. glabra*. Smooth Boswellia. Roxb. as above, t. 207. (Canarium odoriferum; Rumph. Amboin. v. 2. 156. t. 50. Gugulapootchittoo of the Telingas.)—Leaflets smooth, with shallow serratures.—Native of the highest mountains on the coast of Coromandel, flowering in the cool season, and casting its leaves in October. This is one of the largest trees of that country; its wood hard, heavy, and durable. The wounded bark yields a sort of pitch. Leaves crowded at the ends of the branches, a span long, pinnate with an odd one; leaflets all uniform, opposite, ovate-oblong, an inch and a quarter in length. Flowers white, in aggregate, terminal, interrupted, spreading clusters, shorter than the leaves, and coming before them. Nectary red, Anthers oblong, yellow. Capsule oval, about half an inch long.

2. *B. hirsuta*. Hairy Boswellia. (Canarium odoriferum

ferum

ferum hirsutum; Rumph. Amboin. v. 2. 157. t. 51, according to Dr. Roxburgh; but the leaflets are represented entire.)—Leaflets downy, deeply serrated.—On the Ballagut mountains. The *stamens* of this are inserted on the exterior margin of the *nectary*. Roxburgh.

BOTETOURT. Add—By the census of 1810, it contained 13,301 inhabitants, of which 2275 are slaves.

BOTRYCHIUM, in *Botany*, a name derived from *βότρυς*, a bunch of grapes, which the fructification of this genus imitates in miniature.—Swartz Syn. Fil. 171. Willd. Sp. Pl. v. 5. 61. Brown Prodr. Nov. Holl. v. 1. 164. Ait. Hort. Kew. v. 5. 496. Sm. Compend. 155. Pursh 675. (Botrypus; Mich. Bor. Amer. v. 2. 274. Ofmunda; Lamarck Illustr. t. 865. f. 1.)—Class and order, *Cryptogamia Filices*. Nat. Ord. *Filices*, Linn. Juss.

Eff. Ch. Capsules nearly globose, naked, smooth, without a ring, united to the stalk of a compound spike, distinct, each of one cell, and two valves connected behind, bursting transversely in front.

We have already alluded to this genus under *OSMUNDA*, from which it was first separated by professor Swartz. Ten species are described in Willdenow, to which we have two to add.

1. *B. Lunaria*. Common Moonwort. Sw. n. 1. Willd. n. 1. Fl. Brit. n. 1. (Ofmunda Lunaria; Linn. Sp. Pl. 1519. Sm. Fl. Brit. 1107. Engl. Bot. t. 318. Bolt. Fil. 4. t. 4. Fl. Dan. t. 18. f. 1. Lunaria minor; Ger. Em. 405. Matth. Valgr. 254. Camer. Epit. 643.)

B. Lunaria minor ramosa; Camer. Epit. 644.

Fronn simply pinnate; leaflets crescent-shaped.—Native of dry hillsides, or open heaths, throughout the cooler parts of Europe, bearing capsules in June. *Root* perennial, with many stout simple fibres. *Fronn* solitary, from a torn membranous sheath, erect, three to six inches high, smooth, pale green, consisting of a simply pinnate leaf, two inches long, with six or seven pair of obliquely imbricated, fan-shaped, entire or notched, leaflets. From the base of the leaf springs a stout stalk, about the same length, bearing a twice or thrice compound, unilateral, smooth spike of capsules, each about half the size of a mustard-seed; all firmly united, in two sessile rows, with the linear flat rib, or common receptacle.

2. *B. rutaceum*. Rue-leaved Moonwort. Sw. n. 2. Willd. n. 2. (O. Lunaria; Fl. Dan. t. 18. f. 3. Fl. Brit. 7. Lunaria racemosa minor, matricariae folio; Breyn. Cent. 184. t. 94. Morif. sect. 14. t. 5. f. 3.)—Fronn doubly pinnatifid; segments obtuse, notched at the extremity. Fruitstalk from the base of the leaf.—Native of dry open situations, in several parts of Europe. We are not sure of having seen a British specimen; nor is it impossible that a jagged variety of *B. Lunaria*, such as is represented in Breyn. Cent. t. 93, and in Morison as above, f. 2, may have been confounded herewith. *B. rutaceum* is certainly near akin to the *Lunaria*, differing only in the compound division of its leaf, and sometimes of its spike.

3. *B. matricarianum*. Feverfew-leaved Moonwort. (B. matricarioides; Willd. n. 3. Lunaria racemosa, multifido folio; Bauh. Pin. 355. Breyn. Cent. t. 95. Fl. Dan. t. 18. f. 2, media. Morif. sect. 14. t. 5. f. 26.)—Fronn doubly pinnate, pinnatifid; segments oblong, obtuse, toothed. Fruitstalk from the base of the footstalk.—Native of shady situations in Prussia, Denmark, and Bavaria. *Willdenow*. Extremely abundant about Peterburgh, according to the Linnæan herbarium, where are three specimens from thence. The more compound leaf, not always solitary, and especially the insertion of the fruitstalk near the root, not at the top of the leafstalk, surely mark this as a distinct species;

which is confirmed by the plant not being of occasional occurrence, amongst the *Lunaria*, as might be expected of any variety, but plentiful in the countries where it grows at all. We have not heard of this species in Britain. The specific name in Willdenow is a barbarous compound of Greek and Latin, such as we wish botanists, not altogether illiterate, would avoid.

4. *B. fumarianum*. Fumitory-leaved Moonwort. (B. fumarioides; Willd. n. 4. Ait. n. 1. Pursh n. 1. B. lunarioides; Sw. n. 5. "Schkuhr Crypt. 158. t. 157." Botrypus lunarioides; Mich. Boreal.-Amer. v. 2. 274. Ofmunda biternata; Lamarck Dict. v. 4. 650.)—Fronn ternate; doubly pinnate; leaflets crescent-shaped, crenate. Fruitstalk radical.—In pastures and open woods, from New York to Carolina, bearing capsules in June. *Pursh*. Like the last, especially in the insertion of its fruitstalk, at or near the root, but the leaflets exactly resemble those of *B. Lunaria*, which, with professor Willdenow's leave, are by no means uniformly entire.

5. *B. obliquum*. Oblique-leaved Moonwort. Willd. n. 5. Muhlenb. Cat. 98.—Fronn nearly twice ternate; leaflets oblong-lanceolate, finely serrated, unequally heart-shaped at the base. Fruitstalk towards the base of the footstalk.—In open woods of Pennsylvania and Virginia, in June and July. Resembles the preceding very much, and is probably only a variety. *Pursh*. This author describes the spikes as doubly pinnate; those of the last only pinnate.

6. *B. australe*. Southern Moonwort. Brown n. 1.—Fronn ternate; doubly pinnate; leaflets confluent, cut. Fruitstalk from the base of the footstalk.—Sent by Dr. White, from Port Jackson, New South Wales; where, as well as in Van Diemen's island, it was gathered by Mr. Brown. Leaflets bluntly toothed. Fruitstalk pale, a span high, being thrice as tall as the leaf, into whose darker-coloured footstalk it is inserted, a little above the root. The spike is twice or thrice compound, spreading; the stalks pale. Capsules dark brown.

7. *B. ternatum*. Ternate Japan Moonwort. Sw. n. 6. Willd. n. 6. (Ofmunda ternata; Thunb. Jap. 329. t. 32.)—Fronns in pairs, triply pinnate; leaflets notched and serrated. Fruitstalk from the middle of the common footstalk. Spike pinnate.—Gathered by Thunberg once only, near Nagasaki in Japan, in November. A foot high, with two large, opposite, spreading, ternate, then twice pinnate, leaves, half the height of the fruitstalk.

8. *B. diffusum*. Cut-leaved Moonwort. Willd. n. 7. Muhlenb. Cat. 98. Ait. n. 3. Pursh n. 3. Sprengel Crypt. engl. ed. 187. "Schkuhr Crypt. 159. t. 158." (Lunaria botrytes ramosa, geranii molchati foliis, floridana; Pluk. Amalth. 134. t. 427. f. 5.)—Fronn ternate, thrice pinnate; leaflets decurrent, linear-wedged-shaped, sharply toothed at the end. Fruitstalk at the base of the leaf.—In pastures of open dry woods, from New York to Florida, in June. *Pursh*. We have Pennsylvania specimens from the late Dr. Muhlenberg, very much like Plukenet's figure, but we can discover no essential difference between this plant and the following.

9. *B. virginianum*. Virginian Moonwort. Sw. n. 3. Willd. n. 8. Ait. n. 4. Pursh n. 4. "Schkuhr Crypt. 157. t. 156." (Ofmunda virginiana; Linn. Sp. Pl. 1519, excluding Plumier's synonym. Lunaria americana, foliis cicutarie modo elegantior divisis; Morif. sect. 14. t. 4. f. 5. L. multifido folio crasso, &c.; Pluk. Mant. 120. t. 427. f. 8.)—Fronn somewhat ternate, twice pinnate; leaflets decurrent, obovate-wedged-shaped, sharply toothed. Fruitstalk at the base of the leaf.—In shady woods, on a rich vegetable soil, from Canada to Carolina, in June and July.

July. *Pursh.* That author observes, "this is the largest of the species here described. It is known by the name of Rattle-snake Fern, probably from growing near the places where those venomous animals are generally found." Our specimens, one of which was gathered by Clayton, the other by Kalm, are scarcely so large as the last-described, from which they differ chiefly in having rather less compound leaves. The *inflorescence* is somewhat hairy, as in that. Willdenow, negligently as it seems, changed the termination of the specific name to *virginicum*, which could only cause trouble, and we have therefore restored the original.

10. *B. gracile.* Slender Moonwort. Pursh n. 5. Frond ternate, doubly pinnatifid, smooth; segments cut, acute. Spikes slender, pinnate, erect.—In shady fertile woods of Virginia, in June. This species approaches nearly, at first sight, to the preceding, but is much smaller and more slender, besides the other distinctions. *Pursh.* We have from Dr. Muhlenberg what answers to the above account, but should scarcely have thought it distinct. The *inflorescence* indeed is smooth, and simply pinnate, but this corresponds with the smaller size of every part.

11. *B. cicutarium.* Hemlock Moonwort. Sw. n. 4. Willd. n. 9. (*Osmunda cicutaria*; Lam. Dict. v. 4. 650. *O. aphodeli* radice; Plum. Fil. 136. t. 159. Petiv. Fil. n. 168. t. 9. f. 2.)—Frond triply pinnate; leaflets pinnatifid; terminal ones pointed. Fruitstalk from near the base of the footstalk.—Gathered by Plumier in the forests of Hispaniola. The root consists of oblong tapering fleshy knobs. Frond much larger than either of the three last, and essentially different in the nearly radical insertion of the fruitstalk. The spike is twice pinnate. Plumier records, that the Indians give the name of Serpent-herb to this, and to the *Anemia adiantifolia*, thinking them useful applications for the bite of a serpent. This may account for the appellation of Rattle-snake Fern given to n. 9.

12. *B. zeylanicum.* Great Ceylon Moonwort. Sw. n. 7. Willd. n. 10. (*Osmunda zeylanica*; Linn. Sp. Pl. 1519. O. n. 373; Linn. Zeyl. 178. *Ophioglossum laciniatum*; Rumph. Amboin. v. 6. 153. t. 68. f. 3.)—Frond ternate; leaflets ternate or somewhat pinnate, lanceolate, pointed, finely crenate. Spike cylindrical, dense; spikelets capitate.—Native of Ceylon and Amboyna, on the sides of hills, in the borders of woods and thickets. The root is long and creeping, very deep in the ground, with numerous long fibres. Fronds a foot and a half or two feet high, naked, except at the very top of the stalk, from whence proceed three slightly-stalked branches, each of two, three, or more, equal, uniform smooth leaflets, five or six inches long, and one broad, partly decurrent, light green, with many fine transverse veins. From the same point springs a fruitstalk, with a dense cylindrical compound spike, rising rather above the leaflets, the capsules about three together, capitate, at the end of each short partial branch.

BOTRYOLITE. See MINERALOGY, *Addenda.*

BOTRYTIS, in *Botany*, so called from *Bōtrys*, a bunch of grapes, in allusion to the clusters of little globular seeds, or seed-vessels.—Mich. Nov. Gen. 212. t. 91. Perf. Disp. Meth. 40. Syn. Fung. 690.—Class and order, *Cryptogamia Fungi.* Nat. Ord. *Fungi.*

Eff. Ch. Erect, capillary, forked. Seeds in terminal aggregate globules.

1. *B. cinerea.* Ash-coloured Cluster-mould. Perf. n. 1. Disp. Meth. 40. t. 3. f. 9, 10.—Ash-coloured, branching, in broad dense patches.—On rotten gourds, pumpkins, and cabbage-stalks, resembling a common *Mucor*, till examined with a magnifier. The globules are disposed in irregular oblong masses, and discharge powdery seeds.

2. *B. ramosa.* Cross-headed Cluster-mould. Perf. n. 2. (*B. ramosa cinerea*, feminibus rotundis; Mich. n. 2. f. 2.) *B. alba.* (*B. non ramosa alba*, feminibus rotundis; Mich. n. 2. f. 3.)—Ash-coloured, branching, with four-rayed spikes.—Very common in all kinds of corrupting substances. *Micheli.* The minute stems are more or less branched and forked, each branch terminating in a cross, composed of four dense ovate masses of globules, on short horizontal stalks.

3. *B. simplex.* Simple Cluster-mould. Perf. n. 3. (*B. comata grisea*, caule simplici crassiore, feminibus rotundis; Mich. n. 1. f. 1.)—Grey, simple. Spikes radiating.—On half-rotten wood, or wheat-straw, in winter, not unfrequent about Florence. *Micheli.* Each plant consists of a simple, rather firm, stem, a line or two in height, crowned with from three to six ovate masses of globules, on horizontal radiating stalks.

4. *B. spicata.* Oblong-spiked Cluster-mould. Perf. n. 4. (*B. spicata grisea*, feminibus rotundis; Mich. n. 4. f. 4.)—Grey, much branched. Spikes ovate-oblong, stalked, scattered, erect.—Found in September on the shady walks of the botanic garden at Florence. *Micheli.* The stems are repeatedly and irregularly branched, each branch terminating in a little oblong spike of globules.

5. *B. diffusa.* Great White Cluster-mould. Albert. and Schwein. Fung. Nillc. 362.—White, with extensive diffuse branches, and terminal clusters, of about four globules each.—Found once only on half-rotten stalks of potatoes in November, composing dense, white, cottony, fugacious masses, two inches or more in diameter. The globules discharge abundance of powdery seeds like smoke.

BOTTOMRY, col. 4. l. 23, for course *r.* courts.

BOVISTA, in *Botany*, a name of barbarous origin, being formed by Dillenius from the German *Böfßl.* It is adopted by Perfoon for a genus separated from *LYCOPERDON.* (See that article.)—Perf. Disp. Meth. 6. Syn. Fung. 136.—Class and order, *Cryptogamia Fungi.* Nat. Ord. *Fungi.*

Eff. Ch. Cafe smooth, sessile, bursting irregularly at the top; its white external coat (or wrapper) at length separating in fragments. (Powder or seed brownish-purple.) *Perfoon.*

The author defines four species.

1. *B. nigrescens*, which is *Lycoperdon globosum*, Bolt. Fung. t. 118. With. v. 4. 382, and *L. arribizon* of Batfeh, t. 29.

2. *B. plumbea*, figured in Sowerby's *Fungi*, t. 331, as *L. Bovista*, and judged by that author to be but a variety of the former.

3. *B. pusilla*, "Batfeh, t. 41. f. 228;" akin to the first, but only three lines in diameter.

4. *B. furfuracea*, figured by *Micheli*, Nov. Gen. t. 97. f. 6, who says it is common on heaths, and sold with other fungi of this tribe, in the market, at Florence. Perfoon is doubtful of the genus of this last, and we should suspect it to belong possibly to *Tuber.*

Bovista differs from *Lycoperdon* in not being elongated at the base into a sort of stalk; but surely they might, without violence to nature, be united, especially as the species of the present genus are so few and so disputable.

BOURBON, in Kentucky, l. 2, r. 11,869; l. 3, r. 2307.

BOURN, col. 2, l. 21, r. In 1811, the parish of Bourn contained 308 houses, and 1591 persons; 779 being males, and 812 females.

BOURSIPPA, in *Geography*, a town of Bablyonia, according to Strabo; to which Alexander retired when warned by the Chaldeans not to enter Bablyon. This is supposed to be the present village of Bourfa, two leagues

to the S.E. of Hilleh, the scite, as it is conjectured, of ancient Babylon. On the road from hence to Melked Ali, or Nejjif, is the tomb of the prophet Ezekiel, where they pretend to shew the fiery furnace of Shadrach, Mefech, and Abednego. It is a large clumsy building, without beauty or ornament; and, like the tomb of Ezra, on the banks of the Tigris, a short way above Korna, is much frequented by Jewish pilgrims.

BOUVARDIA, in *Botany*, so named by Mr. Salisbury, in memory of Charles Bouvard, M.D. formerly superintendent of the garden at Paris.—Salisb. Parad. 88. Ait. Hort. Kew. v. 1. 245.—Clafs and order, *Tetrandria Monogynia*. Nat. Ord. *Rubiaceae*, Juss.

Eff. Ch. Calyx in four deep segments, with intermediate teeth. Corolla tubular. Anthers within the tube. Capsule of two separable cells, with numerous bordered seeds.

1. *B. triphylla*. Three-leaved Bouvardia. Ait. n. 1. Salisb. Parad. t. 88. (Houstonia coccinea; Andr. Repof. t. 106. *Ixora americana*; Jacq. Hort. Schoenbr. v. 3. 4. t. 257. *I. ternifolia*; Cavan. Ic. v. 4. 3. t. 305.)—Native of Mexico. Introduced by Sir Joseph Banks in 1794, and now become common in the English gardens, where, if planted against the front of a green-house, it will stand our ordinary winters, flowering from Midsummer till the end of autumn. The stem is from one to two feet high, shrubby, branched, downy when young. Leaves usually three in a whorl, ovato-lanceolate, varying in breadth, entire, rough-edged, nearly sessile. Flowers an inch long, bright scarlet, in dense, terminal, forked panicles, very abundant, and extremely showy, though destitute of scent.

BOW, l. *ult.*, r. The parish contains 149 houses, and 727 persons; 329 being males, and 398 females.

Bow, in America, l. 4, r. 729.

BOWDOIN, l. *ult.*, for 983 r. 1649.

BOWDOINHAM, l. *ult.*, for 455 r. 1412.

BOWLESIA, in *Botany*, so named by the authors of the Flora Peruviana, in honour of Mr. William Bowles, a native of Ireland, who published at Madrid, in 1775, an Introduction to the Natural History of Spain, making a 4to. volume of 529 pages, in the Spanish language. This work has been translated into French and Italian. The author died in Spain in 1780.—Sprengel Prodr. 24. Spec. Umbell. 13.—Clafs and order, *Pentandria Digynia*. Nat. Ord. *Umbelliferae*.

Eff. Ch. Fruit ovate, quadrangular, bristly; concave at the back. Umbel simple.

The author enumerates three certain species in his *Prodromus*.

1. *B. palmata*, of Ruiz and Pavon, of which he gives no character or description.

2. *B. lobata*, of the same, "Fl. Peruv. v. 3. t. 251, B." Spreng. Sp. Umb. 13.—Somewhat hairy. Leaves lobed, ribbed; abrupt at the base; lobes entire, pointed. Foot-stalks elongated. Flower-stalks axillary, mostly solitary. Tendrils none.—Native of the loftiest mountains of Peru. Herb slender, green, with some scattered stary pubescence. Leaves opposite, an inch broad, half an inch long, five-ribbed, on slender zigzag footstalks about a finger's length. *Stipulas* membranous, linear, in pairs. Flower-stalks about two lines long, reflexed after flowering, the *stipulas* serving as an involucre. Petals five, cream-coloured. Fruit in pairs, folid, ribbed at the back, clothed with stary hairs.

3. *B. incana*, of the same, "Fl. Peruv. v. 3. t. 268, A." Spreng. Spec. Umb. 13. t. 5. f. 10.—Hoary. Leaves kidney-shaped, lobed, notched; heart-shaped at the base.

Flower-stalks axillary, aggregate. Tendrils axillary.—Native of Peru and Brazil. Our specimen was gathered in the last-mentioned country, by Commerfon, and is larger than Sprengel's figure, being a foot long, though incomplete. This species seems nearly allied to the last. We discover no tendrils in our specimen.

4. *B. geniculata*. Spreng. Spec. Umb. 14. t. 5. f. 11. (Peucedanum geniculatum; Forst. Prodr. 22. Willd. Sp. Pl. v. 1. 1408.)—Smooth. Leaves nearly orbicular, crenate; wedge-shaped and entire at the base. Umbels terminal, many-flowered.—Native of New Zealand. Stem prostrate, branched. Leaves not half an inch broad. Umbels compound. Fruit unknown. This seems to us a very doubtful *Bowlesia*, and is referred hither merely on account of some resemblance of habit.

BOWLING-GREEN, in *Geography*. Add—Alfo, a township of Ohio, in the county of Licking, having 379 inhabitants.

BOXBOROUGH, l. 2, for 412 r. 388.

BOXFORD, l. *ult.*, for 925 r. 880.

BOYLSTON, l. *ult.*, for 839 r. 802.

BOYLSTON, *West*, a town of the same state and county, having 632 inhabitants.

BOZRAH. Add—It contains 960 inhabitants.

BRACCIO, plur. *BRACCI*, a measure for cloth in Italy.

BRACHIONUS. Add—See *VERMES* and *WHEEL-Animals*.

BRACHYSEMA, in *Botany*, so named by Mr. Brown, from βραχυς, *short*, and σημα, *a standard*, alluding to a striking part of the generic character.—Brown in Ait. Hort. Kew. v. 3. 10.—Clafs and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceae*, Linn. *Leguminosae*, Juss.

Eff. Ch. Calyx nearly equally five-cleft; with a swelling tube. Corolla papilionaceous; standard shorter than the compressed keel, which is equal to the wings. Stalk of the germin minutely sheathed. Style thread-shaped, elongated. Legume tumid, with many seeds.

1. *B. latifolium*. Broad-leaved *Brachysema*. Ait. n. 1. Curt. Mag. t. 2008.—"Leaves ovate, flat. Standard oblong-ovate."—Sent by Mr. Good, in 1803, from the fourth-west coast of New Holland, where it was also gathered by Mr. Brown. A hardy green-house procumbent or pendulous shrub, easily propagated by cuttings, and flowering in the spring. Flowers scarlet, very handsome, axillary, nearly sessile, solitary, sometimes two or three together, their small acute standard yellow at the base; wings and keel full an inch long.

There appear to be other species, not yet introduced into the gardens.

BRACKEN, in *Geography*, a county of Kentucky, having 3451 inhabitants, of whom 295 are slaves.

BRADFORD, col. 2, l. 11, r. In 1811, the houses in the hundred of Bradford were 1766, and the number of persons was 9435; 4269 being males, and 5166 females. The parish of Great Bradford contained 548 houses, and 2989 persons.

BRADFORD, in *Yorkshire*, l. 12. The parish of Bradford contains 13 townships, and in 1811 the township of East and West Bradford contained 1574 houses, and 7767 persons: East Bradford having 725 houses, and 3559 persons; 1663 being males, and 1896 females; and West Bradford having 849 houses, and 4208 persons; 1986 being males, and 2222 being females.

BRADFORD, *East and West*. Add—the former contained, in 1810, 1003, and the latter 1219 inhabitants.

BRADFORD, l. 4, r. 1369; l. 9, r. 1034; l. 12, r. 1302.

BRADYPUS,

BRADYPUS, l. 16, for sloth r. bear; l. 20, after megatherium, add—(which see).

BRAIN, *Chemical Analysis of*. For ΑΙΡΟΙΟΙΑ r. ΑΙΔΙΟΙΟΙΕ.

A new and elaborate analysis of the brain has been lately made by Vauquelin; but it must be confessed that his results throw no light whatever upon the manner in which its constituents are combined, or to what its peculiar appearance is owing. The following are the results: 100 parts contain,

Water	- - -	80.
White fatty matter	-	4.53
Reddish fatty matter	-	.70
Albumen	- - -	7.
Ofmazome	- - -	1.12
Phosphorus	- - -	1.50
Acids, salts, and sulphur	-	5.15

100

BRAINTREE, in *Geography*. In 1811, the parish of Baintree contained 508 houses, and 2298 persons; 1082 being males, and 1216 females. The parish of Bocking contained 537 houses, and 2544 persons; 1134 being males, and 1410 females.

BRAINTREE, in America, l. 4, r. 850; l. 12, The inhabitants, in 1810, were 1351.

BRAMPTON, l. 20, r. In 1811, the number of houses was stated to be 265, and of inhabitants 2043; 920 being males, and 1123 females: 52 families being employed in agriculture, and 394 in trade and manufactures.

BRANDON, l. ult. r. In 1811, Brandon parish contained 206 houses, and 1360 persons; 646 being males, and 714 females.

BRANDON, in America, l. 2, r. 1375.

BRANDYWINE. Add—containing 1257 inhabitants. —Also, a hundred in the district of Delaware, and county of New-Castle, containing 2257 inhabitants.

BRANFORD. Add—It contains 1932 inhabitants.

BRANTRIM, a township of Luzerne county, in Pennsylvania, containing 904 inhabitants.

BRASAVOLA, in *Botany*, has received its name from Mr. Brown, in memory of Antonius Mufa Brafavolus, or Brafavolo, an Italian physician and botanist, born at Ferrara in 1500. Haller, who inaccurately spells his name *Braffavolus*, speaks of him as not unlearned in books or languages, or in the plants of his own country. His works, which have been often republished, relate chiefly to the *Materia Medica*. Their author visited France in 1528, and died in 1555.—Brown in Ait. Hort. Kew. v. 5. 216.—Clafs and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Eff. Ch. Calyx and petals distinct, spreading. Lip undivided, with a simple claw. Anther a terminal lid. Masses of pollen eight or more.

We do not feel competent to form an opinion of this genus, having no knowledge but of one species. Mr. Brown, who has more in contemplation, considers the masses of pollen being sometimes more than eight a very remarkable character.

1. *B. cucullata*. Single-flowered Brafavola. Ait. n. 1. (*Cymbidium cucullatum*; Swartz in Aët. Nov. Upf. v. 6. 73. Willd. Sp. Pl. v. 4. 100. *Epidendrum cucullatum*; Linn. Sp. Pl. 1350. Curt. Mag. t. 543. *Helleborine floribus albis cucullatis*; Plum. Ic. 173. t. 179. f. 1.)—Stem nearly single-flowered. Lip fringed.—Native of the West Indies. Brought to Kew by admiral Bligh, in 1793. It flowers in the stove, from June to September. The *stem* is

simple, about a span high, sheathed with a few scales, and crowned with one, rarely two, long, very narrow, keeled, fleshy leaves, and as many large, white, long-stalked, nearly scentless, but very elegant, flowers; their drooping calyx and petals, two or three inches long, surrounding the long, pointed, curiously fringed lip.

BRASSIA, thus named by Mr. Brown, in due commemoration of the late Mr. Brads, a skilful botanical traveller and draughtsman, who collected seeds, plants, and dried specimens, on the Guinea coast, for sir J. Banks, Dr. Fothergill, and Dr. Pitcairn, and whose sketches, being most liberally lent by sir Joseph Banks to Dr. Afzelius, in his visit to Sierra Leone, were maliciously damaged, and partly destroyed, out of characteristic and wanton brutality, by some piratical slave-mongers, under the French flag, during the late war, who struck the first blow towards the ruin of the colony. (See SIERRA LEONE.)—Brown in Ait. Hort. Kew. v. 5. 215.—Clafs and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Eff. Ch. Calyx and petals spreading, distinct. Lip dilated, undivided, nearly flat. Column simple. Anther a moveable lid. Masses of pollen two; divided behind; attached by their middle to a common process of the stigma.

1. *B. maculata*. Spotted-flowered Brassia.—Native of the West Indies. Imported by sir Joseph Banks in 1806. A large and very handsome plant, with broad sheathing coriaceous leaves, and a cluster of large flowers, whose calyx and petals are green, the broad lip white; all beautifully and variously spotted with purple.

BRATTLEBOROUGH, l. 3, r. 1891.

BREAD of Beer. See PAIN des Abaillis.

BREAD of Wood. See WOOD.

BREAST, *Inflammation of, in Surgery*. The diagnosis of this disorder is sufficiently obvious, from the presence of such symptoms as are characteristic of inflammation in general, and which are detailed in our account of this subject in a former volume. Inflammation may be confined to the skin and cellular substance of the breast; or it may affect more particularly the glandular part of this organ. According to usually-received opinions, either of these cases may originate from a suppreffion or obstruction of the secretion of milk, rough handling of the breast, external violence, stoppage of the menfes, impediment to the discharge of the lochia, &c. When the inflammation is moderate, it generally terminates in resolution; but when more severe, or improperly treated, an abscess is the consequence. Though considerable indurations are often produced in the breast by attacks of common inflammation, it is but in a limited proportion of cases that such hardness partakes of the true scirrhus or cancerous nature.

The treatment of inflammation of the breast is to be regulated in a great measure by the kind of cause that has given origin to the complaint; a subject which cannot be duly understood without adverting to what has been said in the various medical and surgical articles of this work on the different species of inflammation. Inflammation of the breast is most frequent in women within the first three months after delivery; and the best means of preventing the disorder consists in having the milk drawn or sucked out of the nipple some weeks previously to delivery. But when the inflammation already exists, or threatens to begin, the same plan of drawing or sucking the breast should be pursued; and, together with general antiphlogistic remedies, the surgeon may have recourse to emollient applications, leeches, fomentations, and when the acute stage of the inflammation is over, to gentle friction with liniments, or to the employ-

nient of resofvent plasters. Abscesses are to be treated on the principles explained in the article SUPPURATION.

BRECHIN, in *Geography*. In 1811, the burgh and parish of Brechin contained 769 houses, and 5559 persons; 2514 being males, and 3045 females.

BRECKENRIDGE, a county of Kentucky, containing 3430 inhabitants, of whom 505 are slaves.

BRECKNOCK, l. 1, for Lancafter *r.* Berks; and add—containing 723 inhabitants.

BRECKNOCK, col. 3, l. 4, after parishes, add—and in 1811 contained 718 houses, and 3196 inhabitants; 1433 being males, and 1763 females: 205 families employed in agriculture, and 375 in trade, manufactures, and handicraft.

BRECKNOCKSHIRE, l. 17, *r.* These, with the hamlets, were peopled in 1811 by 37,735 persons, and contained 7555 houses; 4667 families being employed in agriculture, and 2239 in trade and manufactures.—L. 35. The other rivers are, the Irvon, which falls into the Wye above the town of Buth; the Tawe, which discharges its waters into the Bristol Channel at Swansea; the Taaf; the Llyfni, which passes through Langorfe Mere or Llynfavadan, and runs into the Wye at Glasbury; the Mellie or Iâlte, remarkable for its subterraneous passage in one part of its course; the Hapite, celebrated for its beautiful cascade; and the Honddy at Brecknock. The principal lake in this county is *Llynfavadan*; which see.—L. 41. The iron-works of this county are objects of great importance, in connection with its commerce and prosperity. The first of these is at Llangrwyne, in the parish of Llangenau, now forming an appendage to the works at Sirhowy in Monmouthshire: the next works are those in the vale of Clydach, in the parish of Llanelly: there is another in the parish of Llangatock; others are situated near the source of the Rumney river, on the borders of Glamorganshire; and those of Hirwaun, in the parish of Penderg, at the northern extremity of the county.

BRENTA, in *Commerce*, a liquid measure in some parts of Italy, as at Bergamo.

BRENTFORD. Add—Old Brentford forms a part of Ealing parish, which in 1811 contained 922 houses, and 5361 inhabitants; 2509 being males, and 2852 females. New Brentford is a distinct parish, and contained 297 houses, and 1733 inhabitants; 809 being males, and 924 females.

BRENTWOOD. In 1811, Brentwood contained 218 houses, and 1238 persons; 575 being males, and 663 females.

BRENTWOOD, in *America*, l. 2, *r.* 95.

BRETON, CAPE, l. 6, for 34 *r.* 84.

BREWER. Add—By 43 Geo. III. c. 69. every common brewer of strong beer shall take out a licence, for which he shall pay according to the quantity of beer brewed by him within the year, as specified in the act, ending 5th July every year: but every person who shall first become a brewer of strong beer, for every such licence *l.* 10*s.*, and within ten days after the 5th of July, after taking out such licence, such further additional sum as with the said *l.* 10*s.* shall amount to the duty hereinbefore directed to be paid, according to the number of barrels of strong beer brewed within the preceding year. If he neglect to take out such licence, and to renew it annually, ten days at least before the end of the year, he shall forfeit 5*l.* 24 Geo. III. c. 41. And every common brewer of table beer, not being a common brewer of strong beer, shall take out a licence and pay for the same yearly *l.* 1*s.* to be renewed annually. By 42 Geo. III. c. 38. no person not being a common brewer shall be allowed to retail beer at any higher price than 1½*d.* the quart without entering into a recognisance and obtaining a licence as an ale-house keeper, under pain of forfeiting for each offence 5*l.* over and above the penalty

imposed upon selling beer without a licence. By 15 C. II. c. 11. notices of brewing beer or ale shall be given, and also of erecting or altering any implements for this purpose, on pain of 5*l.* By 5 Geo. III. c. 43. the position of any tun, cooler, copper, &c. shall not be altered without notice, under penalty of 2*l.* The officer of excise shall enter and examine suspected places; and if any person oppose him, he incurs a forfeiture of 2*l.* 7 & 8 W. c. 30. No common brewer shall use any pipes or other private conveyances for any copper in his brew-house, &c. on pain of 2*00l.* 8 & 9 W. c. 19. 42 Geo. III. c. 38. Search shall be made by the officer, and the penalty of opposing him is 5*l.* No common brewer, innkeeper, victualler, or other retailer of beer or ale, shall keep any private storehouse or cellar for laying any beer or ale, or worts in cask, on pain of 5*l.* 15 C. II. c. 11. 1 W. st. 1. c. 24. By 42 Geo. III. c. 38. every common brewer who shall lay off any beer, ale, or worts contrary to the 8 & 9 W. III. shall for every such offence forfeit 1*00l.* Persons inhabiting a market-town, city or town corporate, or parts adjoining to a city or town corporate, in which there is a common brew-house, who shall suffer liquors to be brewed in their houses, otherwise than for their own families or for purposes of charity or hospitality, and who shall lend out brewing vessels, shall forfeit 5*l.* 22 & 23 C. II. c. 5. Gaugers shall take an account, and obstructing them in the exercise of their office incurs a penalty of 1*0l.* and forfeiture of double value for beer, ale, or other specified liquors that have been sold or delivered out, without payment of duty. If any brewer shall bribe the gauger to make a false return he shall forfeit 1*0l.*, and the officer so bribed shall forfeit the same sum; 5 C. II. c. 11. By 42 Geo. III. c. 38. the penalty on mixing liquors to imitate beer, and to be mixed with or used as beer made from malt and hops, or selling such liquors, is 2*00l.* and forfeiture of liquor and utensils; and the penalty on a brewer's receiving stale beer-grounds, and mixing any liquor with beer, except malt and hops, is 1*00l.* Excise officers are authorized to take samples of suspected liquors, search suspected places, and seize forbidden liquors, ingredients, and utensils; and the person in whose custody they are found shall forfeit 1*00l.* No common brewer shall carry out any ale or beer to his customers in any city or market-town, before notice given to an officer of excise, but between three in the morning and nine in the evening from March 25 to September 29; and between five in the morning and seven in the evening from September 29 to March 25, on pain of 2*0s.* a barrel; 15 C. II. c. 11.

And whereas it is expedient that the quantities to be returned as and for a barrel of beer or ale brewed by the common brewer and the allowances for waste should be in all places the same, it is enacted that after the 5th day of July 1803 every 36 gallons of beer or ale brewed by the common brewers in Great Britain, whether within the weekly bills of mortality or without the same, taken according to the standard of the ale quart four thereof to the gallon in the exchequer, shall be reckoned and returned by the gauger or other officer of excise for a barrel of beer or ale; and the allowances to be made in Great Britain to the common brewer not selling beer, ale, or worts in any less quantity than a whole cask containing 4½ gallons, whether within or without the said limits, for waste by fillings and leakage, or otherwise, out of the returns by the gaugers, or other officers, shall be three barrels upon every 36 barrels, both of strong beer or table beer and ale, and after that rate for any greater or less quantity; 43 Geo. III. c. 69. A common brewer who shall sell beer, ale, or worts in any less quantity than a whole cask containing 4½ gallons, shall forfeit 5*l.* for every such

such offence. And if any person, not being a common brewer, shall retail beer at a higher price than after the rate of 1½d. the quart, ale-houfe measure, without obtaining a licence as a common ale-houfe keeper, he shall forfeit 50l. over and above any other penalty for felling beer or ale without such licence; 42 Geo. III. c. 38. Entries shall be made by common brewers once a week, under penalty of 10l.; and by innkeepers once a month on pain of 5l.; and also ale-houfe keepers, victuallers, and other retailers, shall do the same on penalty of 20s. Beer and ale above 18s. per barrel shall be deemed strong, and at 18s. and under, table beer; 43 Geo. III. c. 81. The 42 Geo. III. c. 38. regulates the price, &c. of table beer, and repeals as to this beer 22 Geo. III. c. 68. The penalty for felling table beer at more than the barrel price, exclusive of duty, is 100l.

BREWERIA, in *Botany*, so named by Mr. Brown, in memory of Mr. Samuel Brewer, a Wiltshire botanist, the companion of Dillenius in a botanical visit to Wales, Anglesea, and the Isle of Man, in 1726, and subsequently one of his most valuable correspondents, especially for the Cryptogamic department. Mr. Brewer spent the latter part of his life at Bradford, under the patronage of Dr. Richardson, and, according to Dr. Pulteney, was living in 1742.—Brown Prodr. Nov. Holl. v. 1. 487.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Campanaceae*, Linn. *Convolvuli*, or *Convolvulaceae*, Juss. Br.

Eff. Ch. Calyx in five deep segments. Corolla funnel-shaped, plaited. Style deeply divided. Stigmas capitate. Capsule of two cells, valvular, surrounded by the permanent calyx. Seeds two in each cell.

These are diffuse herbs, not milky; their leaves undivided; flowers axillary, mostly solitary. The genus appears most akin to *Porana*, differing in habit, and in the unaltered calyx of the fruit.

1. *B. linearis*. Linear *Breweria*. Br. n. 1.—Villous. Leaves linear-lanceolate, folded. Style equally divided nearly to the base.—Gathered by Mr. Brown, in the tropical part of New Holland.

2. *B. media*. Intermediate *Breweria*. Br. n. 2.—Slightly villous. Leaves lanceolate; obtuse and somewhat heart-shaped at the base. Style divided half way, into two unequal segments.—From the same country. Br.

3. *B. pannosa*. Woolly *Breweria*. Br. n. 3.—Downy. Leaves ovate, somewhat heart-shaped, densely woolly. Calyx unequal; its outer segments ovate, somewhat pointed. Style in two deep unequal divisions.—From the same country. Br.

We know not whether there be any more species in other parts of the globe.

BREWSTER, in *Geography*, a town of Barnstable county, in the Massachusetts, containing 1812 inhabitants.

BRIBESCA, *dele*.

BRIDELIA, in *Botany*, a genus separated from *Cluytia* by Willdenow, and dedicated by him to the honour of the great systematic mucologist, Dr. Samuel El. Bridel.—Willd. Sp. Pl. v. 4. 978. Ait. Hort. Kew. v. 5. 444.—Class and order, *Polygamia Monocia*, or rather *Monadelphia Pentandria*. Nat. Ord. *Tricoccoe*, Linn. ? *Euphorbie*, Juss. ?

Eff. Ch. Calyx inferior, in five deep segments. Petals five, inserted into the calyx. Stamens with a tubular, columnar base. Styles two, divided. Berry with two seeds. Some flowers want the stamens, some others the germen.

The fruit distinguishes this genus from *CLUYTIA*. (See that article.) Three species only are described, all East Indian.

1. *B. montana*. Mountain *Bridelia*. Willd. n. 1. (*Cluytia montana*; Roxb. Corom. v. 2. 38. t. 171.)—Stem

erect, without thorns. Leaves obovate-elliptical, entire, smooth.—Native of Coromandel. On the interior mountains it grows to a tree, but on the lower lands is only found of a small size. The *Telingas* call it *Pananga*. Roxb. The wood is reddish, very hard. Stem short and thick. Branches slender, spreading. Leaves numerous, alternate, two-ranked, an inch and a half long, on short stalks. Flowers small, crowded, axillary. Berry purple, globular, succulent, the size of a pea.

2. *B. scandens*. Climbing *Bridelia*. Willd. n. 2. Ait. n. 1. (*Cluytia scandens*; Roxb. Corom. v. 2. 39. t. 173.)—Stem shrubby, climbing, without thorns. Leaves oblong-ovate, entire, acute; Downy beneath.—Common on the banks of rivers and water-courses, on the coast of Coromandel, flowering in November and December, and called by the *Telingas* *Doonkyboora*. Roxb. Stem climbing; its branches leafy, flowering at their pendulous extremities. Leaves three inches long; those which accompany some of the flowers diminished almost to bracteas. Berry oval, of a rusty black, the size of a horse-bean. This species was sent to Kew in 1804, by colonel Hardwicke, F.L.S., so well known by his various communications, illustrative of the natural history of India.

3. *B. spinosa*. Thorny *Bridelia*. Willd. n. 3. (*Cluytia spinosa*; Roxb. Corom. v. 2. 38. t. 172.)—Stem arborescent, erect, thorny. Leaves ovate, acute, entire, smooth.—A tree of considerable size found on the mountains along with the first species, and called by the *Telingas* *Coramannu*. The bark is a strong astringent; wood hard and durable, dark-coloured; leaves eaten greedily by cattle, and said to destroy worms in their bowels. Roxb. The leaves are three or four inches long. Flowers in terminal, or axillary, interrupted spikes. Berry black, the size of a pea.

BRIDGEWATER, *l. ult. r.* The parish of Newcastle, higher and lower, contains 157 houses, the former having 40, and the latter 117; and 640 inhabitants, the former including 171, and the latter 469. In the higher, the males are 84, and females 87; in the lower, the males are 210, and females 259.

BRIDGENORTH, col. 2, l. 9, add—In 1811 the borough of Bridgenorth contained 978 houses, and 4386 persons; 2206 being males, and 2380 females: 81 families employed in agriculture, and 870 in trade and manufactures.

BRIDGEPORT, a township of Pennsylvania, in Fayette county, having 280 inhabitants.

BRIDGESTOWN, a town of the district of Maine, in the county of Kennebeck, containing 214 inhabitants.

BRIDGE-TOWN, l. 5, r. 882.

BRIDGEWATER, col. 2, l. 2, add—In 1811 the borough of Bridgewater contained 857 houses, and 4911 persons; 2241 being males, and 2670 females: 87 families employed in agriculture, and 570 in trade and manufactures.

BRIDGEWATER, in America, l. 3, r. 1104; l. 4, r. 2906; l. 5, r. 391; l. 6, r. 5157; l. 10, r. 1154. Add—Also, a township of Luzerne county, in Pennsylvania, having 1418 inhabitants.

BRIDLINGTON, *l. ult. r.* In 1811 Bridlington contained 849 houses, and 3741 inhabitants; 1706 being males, and 2035 females.

BRIDPORT, l. 39, add—In 1811 the borough of Bridport contained 512 houses, and 3567 persons; 1532 being males, and 2035 females: 20 families employed in agriculture, and 600 in trade and manufactures.

BRIDPORT, in America, l. 3, r. 1520.

BRIGHTHELMSTON, *l. ult. r.* In 1811 Brighton contained 2077 houses, and 12,012 persons; 5069 being males, and 6043 females.

BRIGHTON, a town of Massachusetts, in Middlesex county, having 608 inhabitants.

BRIMFIELD, l. 3, r. 1325.

BRISTOL. Add—In 1811, this city, with Barton Regis hundred, contained 11,940 houses, and 76,433 persons; 32,842 being males, and 43,591 females.

BRISTOL, in America, l. 2, r. 2753; l. 8, r. 37,168; l. 13, r. 5072; l. 23, r. 2693; l. 29, add—It contains 1428 inhabitants; l. 33, after houses, add—The number of inhabitants, by the census of 1810, was 628; l. 36, after county—having 965 inhabitants; l. 39, r. 1179, add—Also, a township of Pennsylvania, in Berks county, having 1608 inhabitants.—Also, a township of Ohio, in the county of Trumbull, having 202 inhabitants.

BRITAIN, LITTLE, a township of Pennsylvania, in Lancaster county, containing 11708 inhabitants.

BRITAIN, London, a township of Luzerne county, having 404 inhabitants.

BROAD CREEK, a hundred of Delaware, in the county of Sussex, having 3789 inhabitants.

BROCKLESBY, l. 10, after Ballytore, add—(which fee,) and *dele* the remaining part of the sentence.

BRODIAEA, in *Botany*, so named by the writer of the present article, after James Brodie, esq. F.L.S., of Brodie in North Britain, an experienced and liberal British botanist, whose name often occurs in the *English Botany*, and to whom a genus of the patrician order is with great propriety inscribed.—Sm. Tr. of Linn. Soc. v. 10. 1. Pursh 223. (Hooker; Salif. Parad. 98.)—Class and order, *Triandria Monogynia*. Nat. Ord. *Spatheaceae*, Linn. *Narcissi*, Juss.

Gen. Ch. Cal. none, unless the bractæas be so called. Cor. of one petal, bell-shaped, cut half way down into six nearly equal, oblong, rather spreading segments; throat crowned with three erect scales, shorter than the limb, opposite to three alternate segments. Stam. Filaments three, inserted into the tube between the scales, and opposite to the other three segments, awl-shaped, erect; and opposite vertical, linear, shorter than the scales, cloven at each end. Pist. Germen superior, elliptic-oblong, triangular; style cylindrical, nearly the length of the stamens; stigma triangular, three-lobed. Peric. Capsule of three cells and three valves, with central partitions. Seeds numerous, elliptic-oblong, inserted into the inner margin of each partition in two rows.

Eff. Ch. Corolla inferior, tubular; limb regular, in six deep segments; throat crowned with three scales, alternate with the stamens. Capsule of three cells, with numerous seeds.

1. *B. grandiflora*. Large-flowered Brodiaea, or Missouri Hyacinth. Sm. n. 1. Pursh n. 1. (Hooker coronaria; Salif. Parad. t. 98.)—Scales of the corolla undivided. Partial stalks longer than the flowers.—Discovered by Mr. Menzies in 1792, in New Georgia, on the west coast of North America. Governor Lewis is recorded to have gathered this plant on the plains of the Columbia and Missouri rivers, flowering in April and May. It is reported to have bloomed in Mr. Salisbury's garden, but is not admitted into Hort. Kew. or the Addenda to that work. The root is bulbous, solid. Leaves two, radical, linear, channelled, near a foot long. Flower-stalk solitary, bearing an unequal, bracteated umbel, of upright, handsome, blue flowers, each near an inch long, with yellowish scales, and yellow anthers.

2. *B. congesta*. Crowded Brodiaea. Sm. n. 2. t. 1.—Scales of the corolla cloven. Partial stalks much shorter than the flowers.—Brought by Mr. Menzies, with a coloured drawing, from New Georgia. The flowers are

rather numerous, smaller than the foregoing, and form a dense head, subtended by pointed bractæas.

BROKENSTRAW, a township of Warren county, in Pennsylvania, having 379 inhabitants.

BROMELIÆ, in *Botany*, the 15th order in Jussieu's system, the 5th of his third class. See JUNCI.

The *Bromelia* are thus defined. Calyx (Corolla of Linnaeus) in six, more or less deep, segments, either superior or inferior, equal, or mostly unequal, the three alternate divisions being largest. Stam. six, inserted into the bottom or middle of that part, or sometimes into calycine glands, lying over the germen. Germen simple, superior or inferior; style one; stigma three-cleft. Fruit of three cells, either pulpy and not bursting, or capsular and of three valves; each cell containing one or many seeds. The leaves are sheathing, all for the most part radical. Flowers spiked, panicled, or more rarely corymbose, each accompanied by a spatula.

SECT. 1. *Germen superior*.
Burmanna and *Tilandtia*, with *Puya* of Molina, Juss. append. 447.

SECT. 2. *Germen inferior*.
Xerophytæ, *Bromelia*, and *Agave*.
BROMSGROVE, in *Geography*. In 1811, the parish of Bromsgrove contained 1378 houses, and 6932 persons; 3349 being males, and 3583 females: 357 families employed in agriculture, and 1085 in trade and manufactures.

BRONZITE. See MINERALOGY, *Addenda*.

BROOK, Honey, in *Geography*, a township of Pennsylvania, in Chester county, with 1073 inhabitants.

BROOKE, a county of Virginia, containing 5843 inhabitants, including 332 slaves.

BROOKFIELD, l. 4, r. 3170; l. 11, for 421 r. 1384; l. ult., add—containing 1037 inhabitants.

BROOKLINE, a town of New Hampshire, in Hillsborough county, having 538 inhabitants.—Also, a town of Vermont, in Windham county, having 431 inhabitants.—Also, a town in Strafford county, in New Hampshire, with 657 inhabitants.—Also, a township of Ohio, in the county of Trumbull, having 345 inhabitants.

BROOKLYN, l. 2, 704 inhabitants; l. ult. containing 1200 inhabitants.

BROOME, a county of New York, including 8130 inhabitants.

BROSELEY. In 1811 this parish contained 1025 houses, and 4850 persons; 2448 being males, and 2402 females: 48 families employed in agriculture, and 856 in trade and manufactures.

BROTERA, in *Botany, a name applied to two very different plants, in due commemoration of the Rev. Father Felix Avellar Brotero, professor of botany at Coimbra in Portugal, author of the *Flora Lusitanica*, and several other learned works. The *Brotera* of the late professor Willdenow, Sp. Pl. v. 3. 2399, *Carthamus corymbosus* of Linnaeus, appears to us founded on a total misconception of the structure of the flower, in which we can find no character whatever different from *Carthamus*. This genus is, however, adopted in Ait. Hort. Kew. v. 5. 186, according to the general plan of that work, where the editors had no particular object of reformation or illustration in view. The other *Brotera* is published by professor Sprengel, in Tr. of Linn. Soc. v. 6. 151. Its only species is *B. perfica*, brought by Olivier and Bruguiere from Persia. We regret to observe that this is manifestly a *HYPTIS* (see that article); and we lament that it was, from full confidence in its learned and distinguished author, too incautiously admitted into the Linnaean Transactions, for which*

which the writer of this acknowledges himself entitled to a share of the blame.

BROTHERS' VALLEY, in *Geography*, a township of Pennsylvania, in Somerset county, having 1314 inhabitants.

BROUGH. In 1811 this township contained 131 houses, and 778 persons; 369 being males, and 389 females.

BROUGHTONIA, in *Botany*, so called by Mr. Brown, in memory of the late Mr. Arthur Broughton, of Bristol, author of an "*Enchiridion*," or systematic manual, of British plants, published in 1782; and, after his removal to Jamaica, of the *Hortus Eastensis*, and of a Catalogue of the Botanic garden in the mountains of Liguanea.—Brown in *Ait. Hort. Kew.* v. 5. 217.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Effl. Ch. Calyx and petals spreading. Column unconnected, or attached at the base only to the stalked lip. Anther a movable lid. Masses of pollen four, parallel, divided by complete permanent partitions, and extending at the base into an elastic granulated thread.

Obs. In some instances the base of the lip is elongated into a little tube, attached to the germen.

1. *B. sanguinea*. Blood-red Broughtonia. *Ait. n. 1.* (*Dendrobium sanguineum*; Swartz *Nov. Act. Upf.* v. 6. 82. *Ind. Occ.* 1529. *Willd. Sp. Pl.* v. 4. 132. *Viscum radice bulbosa minus, delphinii flore rubro specioso*; Sloane *Jam. v. 1.* 250. t. 121. f. 2.)—Leaves oblong, in pairs from the top of a bulb. Flower-stalk divided.—This grows on trees and palisades in the woods of Jamaica, forming tufts of leaf-bearing bulbs, the leaves light green, two inches long. *Stalks* radical, a foot high, with a few handsome, corymbose, dark crimson flowers.

This is the only species yet known in our stoves, nor have we an account of any other.

BROUSSONETIA, in *Botany*, (see PAPIRIUS,) where the history and description of this curious tree are given.

BROWN SPAR, or *Bitter Spar*. See MINERALOGY, *Addenda*.

BROWNFIELD, l. 2, for York r. Oxford; l. 3, r. 398.

BROWNINGTON, a town of Vermont, in Orleans county, having 236 inhabitants.

BROWNSVILLE. *Add*—It contains 608 inhabitants.

BRUCHUS, l. 8, *dele* which see respectively, and insert—the insects of this genus are, in general, of a small kind. The *B. granarius* is found among leaves, vetches, and other feeds, the lobes of which it devours, it is about two lines long, of a black colour, and its wing-shells are freckled with white specks; the two fore-legs are reddish, and the thighs of the hind-legs armed with a tooth and forceps. The *B. feminarius* is rather smaller than the preceding, but like it, without the denticle of the hinder thighs. The exotic species are chiefly natives of America.

BRUNNERSTOWN, in *Geography*, a town of Kentucky, in Jefferson county, with 92 inhabitants, of whom four are slaves.

BRUNONIA, in *Botany*, so named by the writer of this, after his highly-valued friend Mr. Robert Brown, F.R.S. librarian to the Linnæan society, no less eminent for acuteness of observation, than for deep botanical science, whose discoveries in New Holland have so often been brought before our readers, and who met with this new and singular genus in that country. The memory of Dr. Patrick Browne, the natural-historian of Jamaica, being already preserved in the *BROWNIA*, (see that article,) it has been found necessary to adopt the above construction, authorized by prece-

dent, to avoid ambiguity.—*Sm. Tr. of Linn. Soc. v. 10.* 365. *Brown Prodr. Nov. Holl. v. 1.* 589.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Aggregate*, or perhaps *Campanaceæ*, Linn. *Dipsacea*, Juss.? *Goodenovia*? Brown.

Gen. Ch. *Cal.* Perianth double, both inferior; outer of four membranous, nearly equal, erect, concave, obtuse leaves; inner of one leaf, rather the longest, turbinate, permanent, with five feathery teeth. *Cor.* of one petal, funnel-shaped, longer than the calyx; limb in five deep, spreading, nearly equal segments, the two upper ones most deeply divided; tube separable into five narrow claws. *Stam.* Filaments five, capillary, weak, inserted into the receptacle; anthers linear, united into a cylinder, the length of the tube of the corolla. *Pistl.* Germen superior, roundish; style club-shaped, about twice the length of the stamens; stigma turbinate, obtuse, concealed by two vertical, equal, orbicular, concave, membranous, converging valves. *Peric.* none, except the inner perianth, lined with the membranous base of the corolla, both together enlarged and hardened, and crowned with the five feathery teeth elongated and divaricated, so as to form a feed-crown. *Seed* solitary, covered, ovate, destitute of albumen, with an erect embryo.

Effl. Ch. Corolla funnel-shaped, five-cleft, irregular. Anthers combined. Stigma with a bivalve sheath. *Seed* one, clothed with the feathery-crowned inner calyx.

The generic distinctions of *Brunonia* are abundantly easy; but to determine its natural order, or affinities, is very difficult, the latter being so many, and so remote from each other, that the plant resembles Horace's imaginary feathered monster, with a horse's neck and human head. Mr. Brown, in the latest view he has taken of the subject, in a most invaluable paper on the natural order of *Compositæ*, *Tr. of Linn. Soc. v. 12.* 132, has pointed out *Brunonia* as a connecting link between that family and the *Goodenovia*; nor are various other links between these very different tribes wanting. With great candour he nevertheless admits whatever favours our idea of its relationship to *Dipsacea* and *Globulariæ*, and moreover adverts to circumstances approaching it to the *Stylideæ*, near allies of *Goodenovia*. Two species only have been detected.

1. *B. australis*. Australian *Brunonia*. *Sm.* as above, 367. t. 28. *Br. n. 2.*—Leaves clothed with spreading hairs. Segments of the calyx feathery all over.—Native of the sandy coasts of the fourth part of New Holland. Abundant in Van Diemen's island, and observed also on the opposite shore of New Holland, at Port Phillip, flowering in January 1804. *Mr. Brown.* *Herb* apparently annual, without a stem, hairy all over, much resembling in habit, colour, and pubescence, the Linnæan *Scabiosa cretica*. *Root* simple, slender. *Leaves* radical, numerous, spatulate, pointed, single-ribbed, entire, tapering at the base, two or three inches long, very hairy. *Flower-stalks* radical, solitary, simple, hairy, especially the lower part, a foot high, each bearing a head of numerous blue flowers, not unlike the Sheep's Scabiosa, *Jafone montana*, but rather larger, and loosely hairy. The head is subtended by numerous, nearly equal, spreading, permanent, hairy bractæ, shorter than the flowers; the inner ones smallest, solitary under each flower.

2. *B. fericea*. Silky *Brunonia*. *Sm.* as above, 367. t. 29. *Br. n. 1.*—Leaves silky with close-pressed hairs. Segments of the calyx with naked coloured tips.—Gathered by Mr. Brown, on the sandy sea-shore at Pine Port, on the east coast of New Holland, just within the tropic, flowering in August 1802. The aspect and pubescence of this species

species exactly answer to *Scabiosa graminifolia*. It differs from the foregoing in having narrower, more numerous, silky leaves, and the flowers differ remarkably in the blunt, coloured, naked points of their inner calyx.

BRUNSVIGIA, so named in 1753, by Heister, in compliment to his patron Charles duke of Brunswick-Lunenburg. What were his serene highness's claims to this honour, we know not, nor is HEISTER any authority in such a case (see his biographical article); but we hope all Englishmen will ever have reason to hail the name of Brunswick, wherever it appears, and the genus in question, long confounded with *Amaryllis*, being now restored, the name of *Brunsvigia* appears with peculiar propriety in the royal garden of England.—Heist. Brunfv. 2. Ait. Hort. Kew. v. 2. 230. Ker in Curt. Mag. under p. 923*.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Spatheacee*, Linn. *Narcissi*, Juss.

Gen. Ch. *Cal.* an oblong, obtuse, compressed, leafy sheath, of two valves, withering. *Cor.* superior, in six deep, lanceolate, recurved, nearly equal segments. *Stam.* Filaments six, awl-shaped, about the length of the corolla; anthers oblong, incumbent. *Pistl.* Germen inferior, obovate, with three furrows and as many rounded angles; style thread-shaped, the length and position of the stamens; stigma bluntish. *Peric.* Capsule turbinate, abrupt, with three rounded wings, membranous, somewhat transparent, of three cells and three valves. *Seeds* several, ovate, acute; curved and compressed at the point.

Effl. Ch. Corolla superior, in six deep segments. Capsule turbinate, membranous, with three wings. Seeds several, pointed.

1. *B. multiflora*. Broad-leaved Brunsvigia. Ait. n. 1. (*Brunsvigia*; Heist. as above, t. 1—3. *Amaryllis orientalis*; Linn. Sp. Pl. 422. Willd. Sp. Pl. v. 2. 58. Jacq. Hort. Schoenbr. v. 1. 38. t. 74. *Narcissus indicus sphaericus*; Morif. sect. 4. t. 10. f. 35. *N. indicus*, flore liliceo, sphaericus; Ferrar. Fl. 125. t. 129. 131. 133.)—Leaves tongue-shaped, depressed, smooth. Flowers somewhat irregular, with ascending stamens and style.—Native of the Cape of Good Hope. The bulb is not uncommon in our stoves, but we never heard of its flowering. That desirable event however happened in the imperial garden at Schoenbrunn, and has enabled the late professor Jacquin to adorn his Hort. Schoenbr. with one of the most splendid botanical figures extant. This is perhaps the most stately of its stately tribe. The large scaly bulb bears five or six obovate-oblong, dark green leaves, lying over each other in two ranks, and usually a foot long, near three inches broad. Flower-stalk earlier than the leaves, erect, round, a foot high, crowned with a broad sheath, of two coloured valves, unequal in breadth, accompanying a very large umbel, of about thirty-five rays, spreading in all directions, each six inches long, bearing a solitary erect flower. All the stalks are more or less of a blood red. Corolla richly varied with crimson and a kind of orange scarlet; its segments an inch and a half long, acute, converging into a tubular form at the base, spreading in the upper part, and reflexed. Capsule two to four inches long, and one broad, pale brown, shining; tapering very much at the base.

2. *B. marginata*. Red-edged Brunsvigia. Ait. n. 2. (*Amaryllis marginata*; Jacq. Hort. Schoenbr. v. 1. 34. t. 65. Willd. Sp. Pl. v. 2. 59.)—Leaves tongue-shaped, depressed, smooth, with cartilaginous edges. Flowers regular, with erect stamens and style.—Native of the Cape, from whence Mr. Masson sent bulbs in 1795. Leaves rather narrower than the former, with a hard red border. Umbel erect, dense, of many scarlet flowers, with upright stamens

and style, rising high above the reflexed corolla. Anthers purple.

3. *B. Radula*. Rasp-leaved Brunsvigia. Ait. n. 3. (*Amaryllis Radula*; Jacq. Hort. Schoenbr. v. 1. 35. t. 68. Willd. Sp. Pl. v. 2. 61.)—Leaves elliptical, depressed, rigid with bristly tubercles. Flowers ringent, with declining stamens and style.—From the same country, introduced by Mr. Masson, in 1790. Leaves two, scarcely more, three inches long, rough-edged, covered on the upper side with bristle-pointed warts. Stalks three or four inches high, sometimes in pairs. Umbels of only four or five pink and white flowers, five of whose segments are directed upwards, the fifth deflexed, along with the stamens and style.

4. *B. striata*. Striated Brunsvigia. Ait. n. 4. (*Amaryllis striata*; Jacq. Hort. Schoenbr. v. 1. 36. t. 70. Willd. Sp. Pl. v. 2. 61.)—Leaves elliptic-obovate, erect; densely striated beneath. Flowers nearly regular, with declining stamens and style.—From the same country as all the rest, introduced by Mr. Masson in 1795. Larger than the last, and distinguished by its upright red-edged leaves. Umbel of many flowers, whose outside is rose-coloured, inner paler, or whitish, the segments narrow, nearly or quite regular.

BRUNSWICK, in Virginia, l. 3, r. 15, 411 inhabitants, including 9368 slaves; l. 5, r. 4378; l. 6, r. 2254; l. 19, add—containing 143 inhabitants.

BRUNSWICK, North, contains 3980 inhabitants.

BRUNSWICK, South, contains 2332 inhabitants.

BRUNSWICK, in Maine, l. 5, r. 2682.

BRUNSWICK, a township in Berks county, in Pennsylvania, having 1770 inhabitants.

BRUSH CREEK, a township of Ohio, in the county of Highland, containing 551 inhabitants.

BRUSSELS, Roger of, r. BRUGES, Roger of.

BRUTON, col. 2, l. 2, r. In 1811, the parish of Bruton contained 353 houses, and 1536 persons; 658 being males, and 878 females.

BRUTUS, l. 5, r. Cayuga. Subjoin—This is an excellent township of Cayuga county, about 10 miles long, N. and S., and by 5 to 6 $\frac{1}{2}$ E. and W. The soil is rich and fertile, and well watered: it contains about 330 families, and 182 senatorial electors. It was erected in 1802, from the N.E. part of Aurelius. In 1810 the population was 2030, and the taxable property amounted to 84,514 dollars.

BRYAN, l. 3, add—containing 2827 inhabitants, of whom 2264 are slaves.

BUBALIS. See ANTELOPE.

BUBASTUS, *dele* see DIDYMA.

BUCCO, col. 2, l. 1, after cinereus, *dele* which see, and add—These are all inhabitants of Africa, and the warmer parts of Asia and America. Their head is very long, their bills strong and nearly straight, almost covered with bristles; tail-feathers generally ten. They are a solitary stupid race, living in sequestered forests, and subsisting principally on insects.

BUCEROS. Add—Several other species are mentioned by Dr. Shaw.

BUCHANAN, l. 7, insert—in 1520. Col. 3, l. 9, insert—in 1532; l. 10, r. Caffis; l. 15, r. 1533; l. 18—this happened probably in the year 1537; l. 43, after said—(but without sufficient evidence); l. ult. but one, insert after admired—The next in merit is the 137th, in elegiac verse. Col. 3, l. 19, after country, insert—in 1562, he officiated as classical tutor to the queen, who was then in the 20th year of her age, and who many afternoons perused with him a portion of Livy. About the year 1566, &c.: l. 30, after York, insert—in 1568; l. 35, after VI., insert—

—in 1570, when the young prince was only four years of age; l. 43, after reading, insert—when the counts of Mar, hearing him wailing, hurried and took him up in her arms, reproaching the tutor for having laid his hand upon the Lord's anointed. Buchanan is said to have replied in terms that contained a very unceremonious antithesis relative to the part which had received the chastisement. Col. 4, l. 9, after motives, insert—and it likewise evinces his anxiety for forming a patriot king; l. 15, for 5th of December r. 28th of September; l. 23, after Edinburgh—in the cemetery of the Grey Friars. Col. 5, l. 10, after unequal, add—although he maintains the unscientific notion that the earth does not revolve round the sun, he supports his opinion by arguments which must at least be allowed to be plausible; l. 9, from the bottom, after great man, insert—neglected by his ungrateful country, which never afforded his grave the common tribute of a monumental stone. Subjoin—See Irving's Life of Buchanan.

BUCKENHAM. In 1811, the parish of New Buckenham contained 127 houses, and 656 inhabitants; 315 being males, and 341 females. The parish of Old Buckenham contained 200 houses, and 1024 persons; 491 being males, and 533 females.

BUCKINGHAM. In 1811, the borough of Buckingham contained 572 houses, and 2987 persons; 1313 being males, and 1674 females: 232 families employed in agriculture, and 466 in trade and manufactures.

BUCKINGHAM, a county of America, l. 3 and 4, for 1790 r. 1810; for 9779 r. 20,059; for 4168 r. 11,675.—Also, a township of Bucks county, in Pennsylvania, having 1715 inhabitants.—Also, a township in Wayne county, in the same state, having 153 inhabitants.

BUCKINGHAMSHIRE, l. 19 and 20, r. In 1811, this county contained 21,929 houses, and 117,650 persons; 13,933 families employed in agriculture, and 8424 in trade and manufactures.

BUCKLAND, l. 2, for 718 r. 1097.

BUCKS, l. 5, for 25,401 r. 32,371; for 114 r. 11; l. 7, for 27 r. 29.

BUCKSTOWN, a township of Ross county, in the district of Ohio, containing 781 inhabitants.

Buckstons, l. 3, for 316 r. 4403.

BUENA, in *Botany*, Cavan. Ic. v. 6. 49. t. 571, is a genus of the natural order of *Rubiaceæ*, so named by that author, in honour of Dr. Cosmo Bueno, an eminent writer on the natural history and topography of Peru. There is no certain proof of this genus being distinct from what Ruiz and Pavon had already called *Gonzalagunia*. We are equally unacquainted with both.

BUFFALO. Add—*East Buffalo* contains 2869, and *West Buffalo* 2523 inhabitants.—Also, a township of Pennsylvania, in Washington county, having 1416 inhabitants.—Also, a township in Armstrong county, in the same state, having 1150 inhabitants.—Also, a township of Butler county, with 375 inhabitants.—Also, a township of Ohio, in the county of Guernsey, having 285 inhabitants.—Also, a township of Ohio, in the county of Jefferson, having 696 inhabitants.

BUFFY Coat of the Blood, *Chemical Properties of*. See BLOOD, section *Fibrin*.

BUILDING, col. 10, l. 47, for 42d r. 14th.

BUILTH, or BUALLT, derived from *Bu*, an ox, and *allt*, an eminence, *i. e.* a wooded eminence, bearing reference to the adjacent country. Col. 2, l. 13, for two weekly r. one good market on Monday; for three r. five; after contains, r. by returns of 1811, 182 houses, and 815 inhabitants; 384 being males, and 431 females. The hundred of Builth

included 1086 houses, and 5788 persons; 2698 being males, and 3090 females: 833 employed in agriculture, and 284 in trade, manufactures, and handicraft.

BULLET, a county of Kentucky, having 4311 inhabitants, including 976 slaves.

BULLOCK, a county of Georgia, in America, containing 2305 inhabitants, 420 being slaves.

BULLSKIN. Add—containing 1439 inhabitants.

BUMCOMBE, a county of North Carolina, containing 9277 inhabitants, of whom 695 are slaves.

BUMEN. See REGAN.

BUMGALOW, a term used in Bengal for a kind of country-house erected by Europeans.

BUNIUM, col. 2, l. 20, for *They r. Ray*.

BUPHAGA, l. 6, for legs r. feet.

BUPRESTIS. At the close, *dele* which see respectively; and add—*The B. gigantea* is the largest of this genus hitherto discovered, being two and a half inches long; a native of India, China, and many other parts of Asia; and found also in South America. The European insects of this genus fall far short of the Indian or American species both in size and splendour.

BURCHARDIA, in *Botany*, is thus named by Mr. Brown, in commemoration of Dr. John Henry Burchard, author of a letter to Leibnitz, in 1702, in which the founded principles of botany are developed; the exclusive importance of the parts of fructification, in forming characters, are especially insisted on, and the classification of Linnæus, by the Stamens and pistils, is anticipated. Heister published this letter, for the first time, in 1750, probably to depreciate the honour of Linnæus. But as the latter could have heard nothing of Burchard's sentiments, he has all the merit of originality, and the attempt to deprive him of this credit, serves only to shew the high estimation in which his performance was held. Heister has named a plant *Burchardia*, but this is *Callicarpa* of Linnæus, so called many years before.—Brown Prodr. Nov. Holl. v. 1. 272.—Class and order, *Hexandria Trigynia*. Nat. Ord. *Melanthaceæ*, Br.

Efl. Ch. Petals six, equal, spreading, with a nectariferous cell in the claw of each, deciduous. Stamens inserted into the base of the petals. Anthers peltate, posterior. Germen triangular. Stigmas acute. Capsule of three separable boat-like cells, bursting at the inner edge. Seeds numerous, in two rows.

1. *B. umbellata*. Umbellate *Burchardia*. Br. n. 1.—Native of Port Jackson, New South Wales. Root of several thick clustered fibres. Herb smooth. Stem simple, leafy. Leaves linear, with entire sheaths; the upper one half embracing the stem. Umbel simple; its stalks without a joint, and with a single bractea at the base of each. Flowers white. Anthers purple. Brown.

BURGH upon the Sands, l. 4, r. as he was preparing for an expedition against the Scots. Hume.

BURICH. For BUDERICH r. BUDELICH.

BURKE, in *Geography*, l. 2, r. 11,007; l. 3, r. 1433; l. 5, r. 10,747 and 4691; l. 9, add—containing 460 inhabitants.

BURKSVILLE, a town of Kentucky, in Cumberland county, containing 106 inhabitants, of whom 20 are slaves.

BURLINGTON, l. 6 and 7, for 18,095 r. 24,979, and for 227 r. 93; add—It contains 12 townships; l. 13, r. 2419, and 4 slaves.

BURLINGTON, a township of America, &c. l. 3, add—This township is well watered, and abounds with mill-heats; its situation is elevated, and the air salubrious; the population is 3196; the senatorial electors 294; and the taxable property,

property, in 1810, amounted to 178,783 dollars. It has two Baptist meeting-houses, one for Congregationalists, and one for Quakers. The inhabitants are principally farmers.

BURLINGTON, a town of Massachusetts, in Middlesex county, containing 471 inhabitants.—Also, a town of Hartford county, in Connecticut, having 1467 inhabitants.—Also, a township of Lycoming county, in Pennsylvania, having 661 inhabitants.

BURNING, *Extraordinary Cases of*. Col. 3, l. 11, for of the head *r.* and the head; l. 5, for 332 *r.* 1690.

BURNLEY, l. *ult.* after contains, add—by the return of 1811, 807 houses, and 4368 inhabitants; 2129 being males, and 2239 females.

BURRILLVILLE, a town of Rhode island, in the county of Providence, containing 1834 inhabitants.

BURSARIA, in *Botany*, so denominated by Cavanilles, from *burfa*, a purse; because the seed-vesel resembles that of the common weed called Shepherd's-purse.—Cavan. *l. c. v. 4. 30.* Ait. Hort. Kew. v. 2. 36.—Class and order, *Pentandria Monogynia*. Nat. Ord.

Eff. Ch. Petals five, inserted into the receptacle. Capsule superior, compressed, of one cell, with four valves. Seeds two, winged.

1. *B. spinosa*. Thorny Burfaria. Cavan. *l. c. v. 4. 30. t. 350.* Ait. n. 1. (*Itea spinosa*; Andr. Repof. t. 314.)

—Native of New South Wales; first raised in 1793, by the late marchioness of Rockingham. This is a thorny, bushy, green-house shrub, flowering from August to December. The leaves are scattered, sessile, narrow-wedged, emarginate, smooth, entire. Flowers numerous, white, small, in copious, aggregate, terminal clusters, of considerable elegance.

BURTON in *Kendal*, l. *ult.* after contains, add—by the return of 1811, 94 houses, and 574 persons; 274 being males, and 300 females. There is another township, named Holme, in the same parish, containing 43 houses, and 283 persons; 137 being males, and 146 females.

BURTON-upon-Trent, l. 4 from the close, add—By the return of 1811, contains 785 houses, and 3979 persons; 1844 being males, and 2135 females.

BURTON, l. 1, for Grafton *r.* Strafford; for 143 *r.* 194. Add—Also, a township of Ohio, in the county of Geauga, having 517 inhabitants.

BURTONIA, in *Botany*, so named by Mr. Brown, in memory of the late Mr. David Burton, a celebrated collector of plants for the Kew garden, under the patronage of Sir Joseph Banks. He died after a short stay in New South Wales; but Mr. Aiton's work evinces the great diligence of this unfortunate traveller. Mr. Salisbury's original *Burtonia* proved an *HIBBERTIA*. (See that article.)—Brown in Ait. Hort. Kew. v. 3. 12.—Class and order, *Decandria Monogynia*. Nat. Ord. *Papilionacea*, Linn. *Leguminosa*, Juss.

Eff. Ch. Calyx deeply five-cleft. Corolla papilionaceous, deciduous; petals nearly of equal length. Germen two-feeded. Style awl-shaped, dilated at the base. Stigma obtuse, beardless. Legume roundish, somewhat tumid. Seeds without any appendage. *Br.*

1. *B. scabra*. Rough-leaved *Burtonia*. Ait. n. 1.

(*Gomphobium scabrum*; Sm. Tr. of Linn. Soc. v. 9. 250.)—Leaves ternate. Calyx smooth. Style bearded beyond the middle.—Found by Mr. Menzies, on the fourth-well coast of New Holland; and sent to Kew by Mr. Good, in 1803. A green-house shrub, flowering from May to July. The leaves are ternate, sessile, linear, revolute, rough to the touch. Flowers about the ends of the branches, axillary, dull purple when dried. There is no account of their natural colour. We do not perceive any important difference in character, and there is none in habit, between this plant and *GOMPHOBIUM* (see that article); but the unpublished species may be more distinct.

BURY, l. 10, after Peele, add—created a baronet in 1800, who, about the year 1773; l. 15, add—In the course of his prosperity he purchased a feat at Chamber-hall, in the neighbourhood, which he afterwards sold; l. 18, for Bolton in Yorkshire *r.* Bolton-le-Moors in Lancashire; l. 23, *r.* the wheel or fly-shuttle, invented about one hundred years ago by Mr. John Kay, who, on account of the persecution he suffered on this account, was obliged to remove to France, where he died; and the card-making machine, for making several cards at once, invented by Mr. Robert Kay, the son of the former, who died about the year 1804. This machine frightens, &c.; l. 29, after shaft, add—and touching neither the wire nor the leather. The woollen manufactures, consisting of flannels, blankets, and a variety of other articles, were established in this town long before the introduction of the cotton trade, and contributed in no small degree to its prosperity; l. 47, *r.* in 1811, the number of houses in this township was 1562, and the number of inhabitants was 8762; 4219 being males, and 4543 females. The parish of Bury includes six townships, viz. Bury, Elton, Heap, Higher and Lower Tottington, and Walmerley.

BURY St. Edmund's, col. 3, l. 3, *r.* In 1811 this borough had 1474 houses, and 7986 inhabitants; 3539 being males, and 4447 females; 164 families employed in agriculture, and 966 in trade and manufactures.

BUSHEL. Add—See *COAL-Busbel* and *WEIGHT*.

BUTE. The *shire* of Bute, by the parliamentary return in 1811, contains 2047 houses, and 12,033 persons; 5545 being males, and 6488 females; 1216 families employed in agriculture, and 530 in trade, manufactures, and handicraft.

BUTLER, r. BUTTER, WILLIAM.

BUTLER, in *Geography*, a county of Pennsylvania, containing 7346 inhabitants.—Also, a township of this county, having 458 inhabitants.—Also, a township of Ohio, in the county of Columbiana, having 316 inhabitants.—Also, a county of Kentucky, containing 2181 inhabitants, of whom 274 are slaves.

BUTTER, *Chemical Properties of*. See *MILK*.

BUXTON. In 1811 the township contained 180 houses, and 934 inhabitants; 447 being males, and 487 females.

BUXTON, a township of America, l. 5, *r.* 2324.

BYRAM, a town of New Jersey, in the county of Essex, having 1224 inhabitants.

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CABAL, *l. ult.* after Shaftsbury, insert—lord Adfley.

CABARRAS, in *Geography*, a county of N. Carolina, with 6150 inhabitants, of whom 1234 are slaves.

CABELL, a county of Virginia, with 2717 inhabitants, of whom 221 are slaves.

CABINET, col. 2, l. 47, *r.* whether they be.

CABOS. Add—The former contains 974, and the latter 1003 inhabitants.

CABOS, in *Geography*, a town of Caledonia, in the district of Vermont, having 886 inhabitants.

CACHOLONG. See *MINERALOGY, Addenda.*

CADIZ, in *Geography*, a town of Jefferson county, in Ohio, with 1374 inhabitants.

CADMIUM, in *Chemistry*, the name of a metal. This metal was discovered by M. Stromeyer in the autumn of 1817, while he was officially examining the apothecaries' shops in Hanover.

Cadmium resembles tin in its colour, lustre, softness, ductility, and the found it produces when bent. Its sp. gr. is 8.6359. It melts and volatilizes at a temperature a little lower than zinc. It preserves its splendour in the air, but by heat it is changed into a yellow oxyd, which is not volatile, and which is very easily reduced. This oxyd does not colour borax; it dissolves very readily in acids, and forms colourless salts, from which it is precipitated white by alkalis. The hydrofulphuric acid (solution of sulphuretted hydrogen) precipitates it yellow, like arsenic. Zinc precipitates it in the metallic state.

This is all which at present we know of this metal, except that it was first obtained from the sublimate which concretes in the chimnies of the zinc furnaces of Saxony; and, consequently, that it exists in the ores of zinc there employed. We understand also that it has been detected in some similar ores of zinc in this country.

CAERFILLY, &c. col. 2, l. 49, add—It has a market on Thursday, and six fairs in the year. By the parliamentary returns of 1811, the number of houses in this hamlet of Eglwysilan parish was 196, and of inhabitants 1013, *viz.* 462 males, and 551 females.

CAERLEON, col. 3, l. 18 from bottom, *r.* The town consists, by the return of 1811, of 170 houses, and 593 inhabitants.

CAERMARTHEN, col. 3, l. 17, after it contains, add—by the parliamentary returns in 1811, 1189 houses, and 7275 inhabitants. The charter allows three markets, *viz.* on Wednesday, Friday, and Saturday, but the latter is the only one numerously attended by the farmers. It has four fairs in the year, and, &c.

CAERMARTHENSHIRE, l. 7,—others reckon its length 50, and breadth 25 miles. Cary estimates its superficial contents at 512,000 acres; l. 23. The Towy is

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much celebrated for its fish; its salmon is highly esteemed; as is also its sewin. The other rivers, not above enumerated, are, the Lougher, Lloghor, or Lycher, which separates this county for some distance from Glamorganshire, receiving in its course the Amman, which united streams discharge themselves into Caermerthen bay, by a wide estuary called the Bury river, navigable for small vessels as high as the town of Lloghor. Another river, denominated Gwendraeth wavr, or great, has its source in a lake at the upper extremity of Mynudd mavr, and joins the sea below Kidwelly: this is joined by Gwendraeth vaeh, or the lefs. Other rivers are the Pycottwr, which falls into the Dethia, and the Camdwer, which augments the Towy. The river Bran unites with the Towy below Llandoverly; the other tributary streams are, the Sawddy, proceeding from a lake in the Black mountain, and the Cennen, which join the Towy, as well as the Cothy and Gwilly, already mentioned. The Corven and the Taf unite at the village of St. Clears, and run into the Caermerthen bay at Laugharne. The lakes of this county are Llyn Tagwyn, or pwll yr Efcob, or the Bishop's pool, situated at the northern extremity, and on the highest elevation of Mynudd mavr, an extensive bleak common, W. of Llandybie, and occupying a surface about half a mile in diameter. Another lake is situated on the Black mountain, at the foot of the almost perpendicular declivity of the Caermerthenshire Fan, or beacon, and extending in form of a parallelogram about one mile in its greatest length. The other lakes are two, which communicate by a frait, and appear like one, situated on the banks of the river Cothy, and near the ruins of the abbey of Talley. The mountains are part of Plinlimmon, and on the E. the long chain called the Black mountain, the summit of which, called y Fan, or Ban Sir Gaer, the Caermerthenshire beacon, is the highest ground in the county. The height of this peak has been estimated at about 2600 feet above the level of the sea. It is separated by a chasm from another eminence, of superior altitude, in Brecknockshire. Both are denominated Bannau Sir Gaer, or Caermerthenshire beacons, in the plural, to distinguish them from those called Bannau Brecheing, or the Brecknockshire beacons. Another mountain lies on the borders of Glamorganshire, called Bettws mountain; it is a chain diverging from the Black mountain, at the upper end of the valley of Tawe, and stretching along the eastern shore of the Amman and Lloghor nearly to the sea:—l. 37.—The number of parishes has been variously estimated; some having reckoned them at 76, others at 85, and others at 78, besides 12 chapelrics. The number of market-towns is flated at eight. This county, by the last return in 1811, contained 14,856 houses, and 77,217 inhabitants; 9878 families employed in agriculture, and 5256 in trade and manufactures.

CAERNARVON. Add—In 1811 the parish of Llan-
3 F bcbhg,

lebbig; in which it is situated, contained 1000 houses, and 4595 persons; viz. 1982 males, and 2613 females.

CAERNARVON, a township of America, &c. l. 2, add—containing 1084 inhabitants.—Also, a township of Berks county, in Pennsylvania, having 723 inhabitants.

CAERNARVONSHIRE, l. 17, r. In 1811 this county contained 9369 houses, and 49,336 persons; viz. 23,379 males, and 25,957 females: 6667 families employed in agriculture, and 2687 in trade and manufactures.

CAERWENT. Add—The parish of Caerwent, in 1811, contained 60 houses, and 375 persons; viz. 206 males, and 169 females.

CAERWYS. Add—In 1811, the parish of Caerwys contained 209 houses, and 863 persons; viz. 416 males, and 447 females.

CÆSARIA, r. COHAWZY.

CÆSIA, in *Botany*, dedicated by Mr. Brown to the memory of Frederico Cæzio, a young Roman nobleman, illustrious for the patronage and cultivation of science, especially of natural history, who founded the academy of the *Lyncæi* at Rome in 1603. This was the first institution of the kind, and is celebrated in various authors of that day. The great Galileo was among its members, as well as that indefatigable botanist Fabio Colonna, better known by his Latin appellation, Columna. This institution died with its noble founder, in 1620; but the scientific associations of Italy, and thence of all Europe, have sprung from its ashes.—Brown Prodr. Nov. Holl. v. 1. 277.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Coronarie*, Linn. *Asphodeli*, Juss. *Asphodelee*, Br.

Eff. Ch. Corolla in six deep, equal, spreading segments, deciduous. Filaments beardless, contracted at each end. Anthers attached by their cloven base. Germs of three cells, with two seeds in each. Style thread-shaped. Stigma one. Capsule scarcely valvular; tumid and lobed at the summit; or club-shaped. Seeds tumid, with an appendage to the scar.

Herbs generally annual, smooth. *Root* of clustered, thick fibres, or oblong knobs. *Leaves* grassy. *Clusters* either divided or simple, with aggregate or solitary flower-stalks, joined under the corolla. *Flowers* whitish, or blue, erect, rarely drooping. *Corolla* becoming spiral after flowering, and soon falling off entire. *Anthers* yellow.

This genus approaches the *Phalangium* of Jussieu, but differs abundantly in the structure of the *germs* and *seeds*.

1. *C. vittata*. Striped Cæsia. Br. n. 1.—Flowers drooping. Stamens pendulous, with parti-coloured filaments. Clusters divided or simple. Leaves flattish. Bulbs fasciculated.—Gathered by Mr. Brown at Port Jackson, and Van Diemen's land.

2. *C. parviflora*. Small-flowered Cæsia. Br. n. 2.—Flowers erect. Filaments simple-coloured. Clusters panicled. Root fibrous.—From the same countries.

3. *C. occidentalis*. West-coast Cæsia. Br. n. 3.—Flowers erect. Filaments simple-coloured. Clusters scarcely divided. Leaves thread-shaped, channelled.—Found by Mr. Brown, in the south-west part of New Holland.

4. *C. corymbosa*. Unbranched Cæsia. Br. n. 4.—Common flower-stalks radical, unbranched. Corymb of few flowers. Leaves flattish.—Native of the south coast of New Holland, and of Van Diemen's land.

5. *C. lateriflora*. Lateral-flowered Cæsia. Br. n. 5.—Stem much branched, scaly. Flowers lateral, drooping, mostly solitary. Capsule club-shaped, pendulous, generally single-seeded.—Gathered by Mr. Brown, in the tropical part of New Holland. The *filaments* are roughish, and the

habit, inflorescence, and capsule differ greatly from all the other species. *Brown*.

CAFFISE, or CAHIZ, in *Commerce*, a measure for corn in Spain, containing 12 fanegas. See FANEGA.

CAFFISO, a measure for oil in Sicily, weighing 12½ rotoli, or about 24 lbs. avoirdupois.

CAHOKIA, in *Geography*, a township of St. Clair county, in the Illinois country, with 711 inhabitants.

CAJEPUT OIL, l. 2.—leaves of a species of the *Melaleuca*, a tree, &c.

CAITHNESS. By the parliamentary returns of 1811, the shire of Caithness contained 4301 houses, and 23,419 persons; viz. 10,608 males, and 12,811 females: 3270 families employed in agriculture, and 838 in trade and manufactures.

CAKILE, in *Botany*, an Arabic name, used by Serapio.—Tourm. Cor. 43. t. 483. Gært. v. 2. 287. t. 141. Willd. Sp. Pl. v. 3. 416. Brown in Ait. Hort. Kew. v. 4. 71.—Clafs and order, *Tetradynamia Siliculosa*. Nat. Ord. *Siliquosæ*, Linn. *Cruciferae*, Juss.

Eff. Ch. Pouch of two single-seeded joints; seed of the uppermost erect, fertile; of the lower pendulous.

Obf. The lower joint is occasionally abortive.

This genus is the real *Bunias* of Linnæus, nor can we see why that name should be changed for the barbarous *Cakile*, though we agree with Mr. Brown in removing hither several species of *Myagrum*, as in the Prodr. Fl. Græc.

CALABOSO, in *Geography*, a town of South America, in Venezuela, situated between two rivers, viz. Guarico to the W. and Orituco to the E. which unite their waters four or five leagues below the town. It is situated in a hot climate, in N. lat. 8° 40', 52 leagues S. of Caraccas, and at about the same distance N. of the Oronoko, and in the year 1804 its population amounted to 4800 persons.

CALADENIA, in *Botany*, from κάλαος, handsome, and ἀδμή, a gland, alluding to the beautiful rows of glands on the lip.—Brown Prodr. Nov. Holl. v. 1. 323. Ait. Hort. Kew. v. 5. 203. (Arethusa; Sm. Exot. Bot. v. 2. t. 104.)—Clafs and order, *Gynandria Monardria*. Nat. Ord. *Orchideæ*.

Eff. Ch. Upper calyx-leaf rather flattened; two lower; with the petals, deflexed under the lip, flat; all glandular at the back. Lip somewhat stalked, with rows of glands on its disk. Style winged. Anther a moveable lid. Pollen powdery.

An elegant tribe of small herbaceous plants, clothed with glandular, intermixed with simple, hairs. *Bulbs* undivided, terminating the descending base of the stem, inclosed in a scaly coat. *Leaf* solitary, nearly radical, mostly linear, enclofed by a sheath at the base. *Stalk* bearing one *bractæa*, besides those immediately accompanying the one, two, or three inodorous, variously-coloured, *flowers*. *Anther* most frequently pointed.

Mr. Brown defines thirteen genuine species, from various parts of New Holland. These have, as it were, ringent *flowers*, the petals nearly equal to the two lower calyx-leaves, and forming with them an under lip, while the upper consists of the upper leaf of the calyx, not quite so flat as the rest. To these are subjoined two species, whose petals are very long, narrow, and directed upwards; and to these, as possibly a distinct genus, the name of *Leptoceras* is given.

Of the true *Caladenia*, the first only, *C. alba*, has been brought alive to England, by Mr. Geo. Caley in 1810, and is marked by Mr. Aiton as a green-house plant, flowering in July and August.—The fifth species, *C. alata*, is probably *Arethusa catenata*, Sm. Exot. Bot. v. 2. 89. t. 104.

CALADIUM, a name used by Rumphius, for some kinds

kinds of *Arum*, and therefore retained by Ventenat for this genus, which is extracted from that.—Venten. Jard. de Cels, 30. Brown Prodr. Nov. Holl. v. 1. 336. Willd. Sp. Pl. v. 4. 487. Ait. Hort. Kew. v. 5. 310.—Clafs and order, *Moracea Polyandria*. Nat. Ord. *Piperite*, Linn. *Aroides*, Juss. Dr.

Eff. Ch. Sheath of one leaf; convolute at the base. Spadix covered at the summit with peltate many-celled anthers; glandular in the middle; covered with germens at the base. Stigma umbilicated. Berries of one cell, with many feeds.

This genus, differing from *Arum* chiefly in the *spadix* being covered in all its upper part with *stamens*, except, in some instances, a small naked point, is divided like that, (see *ARUM*.) into three sections, similarly distinguished. Willdenow has fifteen species in all.

SECT. 1. *Stem none. Leaves compound*. One species.

1. *C. helleborifolium*. Hellebore-leaved Caladium. Willd. n. 1. Ait. n. 1. (*Arum helleborifolium*; Jacq. Coll. v. 3. 217. Ic. Rar. t. 613.)—Leaves radical, pedate, entire.—Native of woods in Martinico and the Caraccas. The flowers are greenish-white, on radical stalks. Leaves a foot in breadth, of eleven elliptic, acute leaflets.

SECT. 2. *Stem none. Leaves simple*. Six species, to which we add one.

2. *C. pinnatifidum*. Pinnatifid Caladium. Willd. n. 2. (*Arum pinnatifidum*; Jacq. Hort. Schoenbr. v. 2. 31. t. 187.)—Stem none. Leaves pinnatifid.—Native of woods at the Caraccas, where this large species grows on rocks and trees. The leaves are two feet long, and nearly as broad, deeply pinnatifid, with great red ribs. Flowers almost sessile; blood-red in their lower half; white, like the *spadix*, above. The rest are,

3. *C. ovatum*. Ovate Caladium. (*Arum ovatum*; see our n. 22. Linn. Sp. Pl. 1371. Karin pola; Rheede H. Mal. v. 11. 45. t. 23.)

4. *C. bicolor*. Two-coloured Caladium. Vent. Cels, t. 30. Ait. n. 2. (*A. bicolor*; n. 10. Curt. Mag. t. 820. Jacq. Hort. Schoenbr. v. 2. 30. t. 186.)—This was long mistaken for *Arum pictum*, Linn. Suppl. 410.

5. *C. nymphaefolium*. Water-lily-leaved Caladium. Willd. n. 5. Ait. n. 3. (Welsch; Rheede H. Mal. v. 11. 43. t. 22.)—Stem none. Leaves peltate, ovate-arrowshaped. Sheath cylindrical, with a lanceolate point, shorter than the *spadix*.—Native of the East Indies.

6. *C. esculentum*. Eatable Caladium, or Indian Kale. Ait. n. 4. (*Arum esculentum*; n. 11. A. minus, nymphaeae foliis, esculentum; Sloane Jam. v. 1. 167. t. 106. f. 1.)

7. *C. acre*. Acid Caladium. Br. n. 1.—Stem none. Leaves peltate, heart-shaped. Spadix obtuse, with a very short, occasional, naked point. Sheath lanceolate, twice as long as the *spadix*.—Gathered in the tropical part of New Holland by Mr. Brown, who remarks that it scarcely differs, except in having *anthers* to the summit of the *spadix*, from the last, which has a manifest acute naked point, and he does not see how the latter is distinguished from *Arum Colocasia*.

8. *C. sagittifolium*. Arrow-leaved Caladium. Willd. n. 7. Ait. n. 5. (*Arum sagittifolium*; n. 16. Jacq. Hort. Vind. v. 2. 73. t. 157.)

SECT. 3. *With leafy stems*. Eight species.

9. *C. scandens*. Climbing Caladium. Willd. n. 8. ("Culcacia scandens; Beauv. Fl. Ov. et Ben. 4. t. 3.")—Climbing. Leaves ovate-oblong, pointed. Spadix longer than the hooded *spatha*.—Native of Benin, on the coast of Africa.

10. *C. seguinum*. Dumb-Cane Caladium. Willd. n. 9. Ait. n. 6. (*Arum seguinum*; n. 26. Linn. Sp. Pl. 1371.)

11. *C. xanthorrhizon*. Yellow-rooted Caladium. Willd. n. 10. (*Arum xanthorrhizon*; Jacq. Hort. Schoenbr. v. 2. 32. t. 188.)—Stem erect. Leaves heart-arrowshaped. Sheath hooded, contracted in the middle, longer than the *spadix*.

12. *C. grandifolium*. Great-leaved Caladium. Willd. n. 11. Ait. n. 7. (*Arum grandifolium*; Jacq. Hort. Schoenbr. v. 2. 32. t. 189.)—Stem taking root. Leaves heart-arrowshaped. Spatha with an ovate hood, not longer than the *spadix*.—On rocks and trees at the Caraccas.

13. *C. arborefcens*. Tree Caladium. Willd. n. 12. Ait. n. 8. (*Arum arborefcens*; n. 25. Linn. Sp. Pl. 1371.)

14. *C. lacernum*. Jagged Caladium. Willd. n. 13.—"Stem taking root. Leaves heart-shaped, sinuated."—Parasitical on trees at the Caraccas. Sent by Jacquin, under the above name, to Willdenow.

15. *C. tripartitum*. Three-leaved Caladium. Willd. n. 14. (*Arum tripartitum*; Jacq. Hort. Schoenbr. v. 2. 33. t. 190.)—Stem taking root. Leaves ternate. Footstalks naked. Spadix the length of the ovate-hooded sheath.—From the Caraccas.

16. *C. auritum*. Ear-leaved Caladium. Willd. n. 15. Ait. n. 9. (*A. auritum*; n. 29. Linn. Sp. Pl. 1371. Jacq. Hort. Schoenbr. v. 2. 33. t. 191.)

CALAIS, l. 3, for 43 r. 41, a town of Washington county, in the district of Maine, which by the census of 1810 contained 372 inhabitants.—Also, a town of Caledonia county, in Vermont, containing 841 inhabitants.

CALCIUM, in *Chemistry*, the metallic basis of lime. See LIME.

CALDÁRA DA CARAVAGGIO, POLIDORO, in *Biography*, an eminent painter, was born in the Milanese, and from the humble station of a labourer became an assistant of Raphael in the works of the Vatican, and at length acquired universal celebrity in his imitation of the antique basso-relievos, which he executed in chiaro-oscuro. His style was in so peculiar a sense his own, that, having formed it, it also perished with him. His design was without manner, compact, and correct. He had the art of transporting himself, says his biographer, into the times of which he represented, the transactions, the costume and rites, so that nothing modern is discerned in his works. Numerous as his performances once were at Rome, scarcely a fragment remains, if we except the fable of Niobe, left in ruins by time and the rage of barbarians. For these losses we are compensated merely by the prints of Cherubino Alberti, and Henry Golzius, who engraved his gods, the Niobe, and the Brennus; and also by the etchings of Santes Bartoli and Gallestruzzi. On occasion of the pillage of Rome by Bourbon in 1527, Polidoro fled to Naples, where he was patronized by Andrea da Salerno, and gained such reputation that he began to form a school; but declining the prosecution of this undertaking, he removed to Sicily. Having exchanged chiaro-oscuro for colour, he painted at Messina a numerous composition of Christ led to Calvary, which has been highly extolled by Vafari; and not long after the completion of this work, he was strangled in bed by a servant, who wished to get possession of his property. His manner, as a colourist, is said to have been dim and pallid. He died in 1543, at the age of 51 years. Pilkington's Dict. of Painters by Eusebi.

CALDWELL, in *Geography*, a town of Effex county, in New Jersey, containing 2235 inhabitants, of whom 54 are slaves.—Also, a county of Kentucky, with 4268 inhabitants, including 579 slaves.

CALECTASIA, in *Botany*, from *καλος*, beautiful, and *εκτασις*, an extension, or dilatation, alluding to the elegant star-like expansion of the corolla.—Brown Prodr. Nov. Holl.

† 1, 263.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Junci*, Julif. *Juncææ*, Br.

Eff. Ch. Calyx inferior, tubular, falver-shaped; limb coloured, in fix deep segments. Stamens inferted into the mouth of the tube. Anthers linear, converging, attached by the bafe. Germen of one cell, with rudiments of three erect feeds. Style thread-shaped. Stigma fimple. Capfule membranous, fingle-feeded, enclosed in the hardened tube of the calyx.

1. *C. cyanea*. Blue Calceftafia. Br. n. 1. Bot. of Terra Austr. 77. t. 9.—Found by Mr. Brown, on the fouthern coast of New Holland.—A little fhrub, flowering in December, very much branched, clothed with acerofe heathing leaves. Flowers folitary, at the ends of the fhort branches. Tube of the calyx covered by the sheaths of the leaves; the limb prominent, like a bright blue ftar, of fix equal rays, the three outermoft downy underneath. This pretty genus is not very nearly allied to any other, though fomething like *Aphyllanthes*, but widely different in ftructure, and rather approaching *DASYPOGON*, hereafter to be defcribed.

CALEDONIA, a county of Vermont, l. 2, r. 23; add—In 1810, it contained 18,750 inhabitants.

CALEIDOSCOPE, or KALEIDOSCOPE, from *καλος*, beautiful, *ειδος*, a form, and *σκοπεω*, to fee, an inftrument recently invented by Dr. Brewfter, and for which he has obtained a patent, for the purpofe of creating and exhibiting an infinite variety of beautiful forms.

The inftrument in its fimpleft form confifts of two reflecting planes, inclined to each other, made either of two plates of glafs, blackened or flivered, or two metallic fufaces, or the two inner fufaces of a folid prism of glafs, or rock-crystal, from which the light fuffers total reflection. The plates may be of any length; but that which is moft convenient will be found to be from five to ten or twelve inches, or they may be made only two, three, or four inches long, provided diftinct vifion is obtained at one end, by placing at the other end an eye-glafs, whole focal length is equal to the length of the reflecting-plane; their breadth fhould be about eight or nine-tenths of an inch when the length is fix inches; but it fhould increafe with the length, in order to have the aperture of the fame angular magnitude. Two edges of thefe reflectors, being made perfectly ftraight, are placed together by a particular contrivance, in fuch a manner, that their inclination, or the angle which they form, is exactly an even aliquot part of a circle, or a fourth, fixth, eighth, tenth, twelfth, fourteenth, &c. part of 360°. When the plates are thus fixed in a tube, and the eye placed at one end, as near as can be, in the line of the interfection of the two planes, it will perceive a circular field of view, compofed of as many luminary fectors as the number of times the angle formed by the reflectors is contained in 360°. Thefe fectors, excepting the one feen by direct vifion, and confituting the angular aperture of the plates, are a feries of images of this aperture, formed by fucceffive reflections between the inclined reflectors. The images formed by one reflector from each of the plates lie on each fide of the direct aperture, and are inverted images of that aperture; the next two images formed by two reflections are images not inverted; and fo on throughout the whole feries, every two direct images being feparated by an inverted one.

From thefe obfervations, it will be feen that the caleidoscope is not an inftrument which produces beautiful forms by the multiplication of fingle forms; for it is demonftrable, that a fymmetrical and beautiful pattern cannot be produced by the repetition of any fingle form: and if it were poffible to conftitute a multiplying-glafs with mathematical perfec-

tion, and free from all the prifmatic colours, it would be impoffible to produce with it an arrangement of fimple forms, marked with fymmetry and beauty. The principle of the caleidoscope, therefore, is to produce fymmetry and beauty by the creation and fubfequent multiplication of compound forms, each of which is compofed of a direct and an inverted image of a fimple form.

The tube which holds the reflecting plates moves in another tube; and upon the outer end of the laft tube is placed a cell, or cap, for receiving a feries of object-plates, containing fragments of differently-coloured glafs and other fubftances placed at random. When one of thefe object-plates is placed in the cell, the inner tube is puffed in as far as it will go; and the inftrument being held in one hand, the cell containing the object-plates may be removed round with the other, and the eye of the obferver being placed at the other will obferve the irregular mafles of colour arranged in an infinite variety of forms, mathematically fymmetrical, and highly pleafing to the eye.

If the object be put in motion, the combination of images will likewise be put in motion, and new forms, perfectly different, but equally fymmetrical, will fucceffively prefent themfelves; fometimes varying in the centre, fometimes emerging from it, and fometimes playing around it in double and oppofite oscillations. When the object is tinged with different colours, the moft beautiful tints are developed in fucceffion, and the whole figure delights the eye by the perception of its form, and the brilliancy of its colouring.

The effects, of which we have given a general defcription, obviously arife from inverfion and fubfequent multiplication of every object placed before the angular aperture, or the luminous fector feen by direct vifion, and from the perfect junction of all the reflected images. When the object is moved, the inverted images all feem to move in an oppofite direction, while the images not inverted move in the fame direction with the object; and from thefe oppofite motions, as well as from the entrance of new objects, by the revolution or the direct motion of the object-plate, arifes that endless variety of forms which affords fo much gratification to the eye.

In the preceding form of this inftrument, the object muft neceffarily be placed clofe to the end of the reflectors; for if it is removed from this pofition, the fymmetry is deftroyed, and the deviation from a fymmetrical form increafes as the diftance of the object from the reflector increafes. The ufe of the inftrument in this form is, therefore, limited to objects which can be held clofe to the reflector.

This limitation, however, has been fuperfeded; and the ufe and application of the inftrument indefinitely extended by an optical contrivance. A lens of a fhort focal length is placed on the object end of the outer tube, and the inner tube is drawn out till the image of objects, whatever be their diftance, falls exactly on the outer end of the reflectors. When this is the cafe, thefe objects will be arranged into the moft beautiful and fymmetrical forms, in the fame manner as if they had been reduced in fize, and actually placed at the end of the reflectors. In this way, every object in nature may be introduced into the picture formed by the inftrument, and the obferver will derive a new and endless fource of enjoyment by the creation of pictures of natural objects, whether animate or inanimate.

As the caleidoscope is of great ufe in the ornamental arts, particularly to carpet and lace manufacturers, calico-printing, paper-ftaining, jewellery, &c. &c., its adaptation to their purpofe is effected by occasionally furnifhing the inftrument with a ftand, in order that the pattern may be fixed

whilst the artist is engaged in copying it. It is also capable of being used with Dr. Wollaston's camera lucida, by which means those who would otherwise be unable to copy the patterns may do it with perfect facility and accuracy. The effects of the instrument may also be exhibited to many persons at once, on the principles of the solar microscope, or magic lantern. The instrument for scientific purposes is occasionally so constructed as to admit of the inclination of the reflectors being varied at pleasure. Under the authority of Dr. Brewster, caleidoscopes of all the different forms are manufactured by the opticians with great accuracy and perfection; but the popularity of the instrument has been such as to induce a great number of individuals, who have been ignorant of its principles, to infringe upon the patent, and impose upon the public a wretched imitation of the original, possessing none of the properties which are essentially necessary to the production of beautiful and symmetrical forms; and in order to justify such proceedings, it became necessary to search out for some combination of mirrors already described, which might have some resemblance to Dr. Brewster's instrument: and the first supposed anticipation of it was found in prop. 13 and 14 of Wood's Optics; but professor Wood, in a letter to Dr. Brewster on the subject, has most handsomely disclaimed having in contemplation the effects produced by the caleidoscope in giving the propositions alluded to. The next supposed anticipation was an instrument proposed and made by Mr. Bradley in 1717, which consisted of two pieces of silvered looking-glasses, five inches wide, and four inches high, jointed together with hinges, and opening like a book. These plates being set upon a geometrical drawing, and the eye being placed in front of the mirrors, the lines of the drawing were seen multiplied by repeated reflections. This instrument had been described long before by Kircher, and did not receive a single improvement from the hands of Bradley. It had been often made by the opticians; but no person ever thought of applying it to any purpose of utility, or of using it as an instrument of rational amusement by the creation of beautiful forms: indeed, from its construction, it is quite incapable of producing any of the singular effects of the caleidoscope. As, however, the similarity between the two instruments is maintained by many persons, either from ignorance or interest; in order, therefore, to render that justice to Dr. Brewster which to us appears his due, we give the following statement of the differences between the two instruments, upon the supposition of their both being applied to geometric lines upon paper.

1. In Bradley's instrument, the length is less than the breadth of the plates.
2. Bradley's instrument cannot be used with a tube.
3. In Bradley's instrument, from the erroneous position of the eye, there is a great inequality of light in the sectors, and the last sectors are scarcely visible.
4. In Bradley's instrument, the figure consists of elliptical, and consequently unequal sectors.

1. In the caleidoscope, the length of the plates must be four, five, or six times their breadth.
2. The caleidoscope cannot be used without a tube.
3. In the caleidoscope, the eye is so placed, that the uniformity of light is a maximum, and the last sectors are distinctly visible.
4. In the caleidoscope, all the sectors are equal, and compose a perfect circle, and the picture is perfectly symmetrical.

5. In Bradley's instrument, the unequal sectors do not unite, but are all separated from one another by a space equal to the thickness of the mirror-glass.
6. In Bradley's instrument, the images reflected from the first surface interfere with those reflected from the second, and produce a confusion and overlapping of images entirely inconsistent with symmetry.
7. In Bradley's instrument, the defects in the junction of the plates are all rendered visible by the erroneous position of the eye.

5. In the caleidoscope, the equal sectors all unite into a complete and perfectly symmetrical form.

6. In the caleidoscope, the secondary reflections are entirely removed, and therefore no confusion takes place.

7. In the caleidoscope, the eye is so placed, that these defects of junction are invisible.

To which it may be added, that professors Playfair of Edinburgh, and Pictet of Geneva, and the celebrated Mr. Watt, have each of them borne testimony to the dissimilarity of the two instruments, and to the unquestionable claim which Dr. Brewster has to the invention of the caleidoscope.

CALENDAR. To the French calendar, annex—the French have abolished their new calendar, and restored the Gregorian, which was ordered to be used in all their dates after the 1st of January, 1806.

CALEYA, in *Botany*, a very distinct and elegant genus, thus named by Mr. Brown, in just commemoration of Mr. George Caley, an able and accurate botanist, who has for several years been employed by sir Joseph Banks, in the investigation of the vegetable productions of New South Wales, but whose discoveries are not all admitted into Mr. Brown's work, being, we hope, destined to appear in some more popular, and more amply descriptive, publication.—Brown in Ait. Hort. Kew. v. 5. 204. (Caleana; Br. Prodr. Nov. Holl. v. 1. 329.)—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Ess. Ch. Flower reversed. Calyx-leaves and petals linear, nearly equal, spreading. Lip stalked, peltate, hollow, opening outwards. Style dilated. Anther a permanent lid. Pollen powdery.

There are two species, *C. major* and *minor*, both found near Port Jackson; the former sent to Kew, by Mr. Caley, in 1810. These are smooth *herbs*, with simple naked bulbs. *Leaf* radical, solitary, linear, sheathed at the base. *Flowers* few, brownish-green; the *lip* and *column* red. The *lip* is moveable, reflexed; but during rain it becomes inflexed over the *column*, which Mr. Brown is doubtful whether to attribute to the diminution of light, or to the irritation of the rain.

CALICIUM, from *καλικιον*, a little cup, well expressing the form of the fructification.—Perf. in Uit. Ann. fasc. 7. 20. Achar. Syn. 55. "Lichenogr. 39. t. 3. f. 1—8."—Class and order, *Cryptogamia Alga*. Nat. Ord. *Lichenes*.

Ess. Ch. Crust uninterrupted, uniform. Receptacles cup-shaped, cartilaginous, stalked, more or less elevated, containing a compact powdery mass of seeds, forming an even disk.

Acharius defines twenty-five species of this curious and beautiful, though minute and inconspicuous genus of the *Lichen* tribe. They form grey, white, or yellow patches, of various extent, on old wrought wood, or boards, exposed to the

the weather; sometimes on the old bark of trees. The *receptacles* are, most frequently, each elevated on a slender brittle-like *stalk*, usually black, like a horse-hair, and so different from the chalky or granulated *crust* from whence they grow, as to appear altogether parasitical. Their powder when touched stains the fingers. Sixteen species are described and figured in Eng. Bot. especially in vol. xxxv.

CALLICOMA, Curt. Mag. t. 1811. See CODIA.

CALLISTACHYS, or rather CALLISTACIYA. See OXYLOBIUM.

CALNE. The borough and parish of Calne, in 1811, contained 750 houses, and 3547 persons; viz. 1621 males, and 1926 females: 325 families employed in agriculture, and 402 in trade and manufactures.

CALOCHILUS, in *Botany*, from *καλος*, beautiful, and *χιλος*, a lip.—Brown Prodr. Nov. Holl. v. 1. 320.—Clafs and order, *Gynandria Monandria*. Nat. Ord. *Orchideae*.

Eff. Ch. Calyx ringent; two lower leaves under the lip. Petals sessile, smaller, erect. Lip longer than the calyx, sessile, pointed; bearded at the margins and on the disk. Anther parallel to the stigma, permanent.

Herbage smooth. *Bulbs* undivided, naked. *Leaves* few, all on the stem; the lower one channelled, much longer than the rest. *Spike* racemose, lax, with prominent, reddish, rather large *flowers*. Nearly akin to *NEOTTIA*; see that article.

1. *C. campestris*. Br. n. 1.—Lip not much longer than the calyx, with a half-lanceolate point, one-fifth its own length. Column with two glands at the base. Bractæes longer than the germen. Flowers from four to eight.—Gathered by Mr. Brown at Port Jackson, as well as in the tropical part of New Holland.

2. *C. paludosus*. Br. n. 2.—Lip twice the length of the calyx, with a ligulate zigzag point, half its own length. Column without glands. Bractæes shorter than the germen. Flowers from two to four.—Found by Mr. Brown, at Port Jackson.

CALOCHORTUS, from *καλος*, beautiful, and *χορτος*, a grass. Pursh 240.—Clafs and order, *Hexandria Trigynia*. Nat. Ord. *Coronarie*, Linn. *Junci*, Juss. *Melanibaceae*, Brown.

Eff. Ch. Corolla in six deep spreading segments; three innermost largest; woolly above, with a smooth spot at the base. Filaments very short, inserted into the base of each segment. Anthers erect, arrow-shaped. Stigmas reflexed. Capsule of three cells.

1. *C. elegans*. Grassy Woolly-flower. Pursh n. 1.—Found by governor Lewis, at the head-waters of the Koolkoolky, North America, flowering in May. *Bulb* solid, globular, eaten by the natives. *Leaf* solitary, radical, grassy, ribbed, nearly smooth, taller than the *flower-stalk*, which is simple, round, smooth, bearing two or three very elegant, drooping, white *flowers*, the size of *Hyloxis erecta*, on slender *partial stalks*, each accompanied by a linear-lanceolate bractæa. The three inner segments of the corolla are covered with long down, and marked with a roundish, smooth, purple spot at their base.

CALOGYNE, from *καλος*, handsome, and *γυν*, a female.—Brown Prodr. Nov. Holl. v. 1. 579.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Campanulee*, Linn. *Campanulaceae*, Juss. *Goodenovie*, Brown.

Eff. Ch. Calyx superior, in five deep equal segments. Corolla two-lipped. Anthers separate. Style three-cleft. Stigmas each with a cup-shaped integument. Nectary a gland between the two lower filaments. Capsule imperfectly two-celled. Seeds imbricated, compressed.

1. *C. pillosa*. Br. n. 1. the only species, found by Mr. Brown in the tropical part of New Holland. An annual hairy plant, smelling when dried like our *Antboxanthum*. The leaves are cut or toothed; floral ones auricled at the base. *Stalks* axillary, single-flowered, without bractæes; reflexed as the fruit ripens.

This plant is separated from *GOODENIA*, (see that article,) solely on account of the three-cleft *style*, and three *stigmas*, and Mr. Brown hesitates about the propriety of the measure.

CALOMERIA. See HUMERA.

CALOPOGON, from *καλος*, handsome, and *πογών*, a beard.—Brown in Ait. Hort. Kew. v. 4. 204.—Clafs and order, *Gynandria Monandria*. Nat. Ord. *Orchideae*.

Eff. Ch. Flower reverfed. Calyx and petals spreading, distinct. Lip stalked; disk bearded. Style unconnected. Anther terminal, permanent; pollen angular.

1. *C. pulchellus*. Tuberous Calopogon. Ait. n. 1. (Limodorum tuberosum; Linn. Sp. Pl. 1345. Curt. Mag. t. 116. Cymbidium pulchellum; Swartz Nov. Act. Upf. v. 6. 75. Willd. Sp. Pl. v. 4. 105. Pursh 592. Big. Bot. 208.)—Native of meadows and mossy bogs, in North America, from Canada to Florida, flowering in July. An elegant plant, eighteen inches high, unbranched, with a small, tuberous, white root, one sheathing sword-shaped leaf, and a simple lax spike, of three or four large, beautiful, purple flowers, whose lip bears a yellow tuft of round-headed fibres. We cannot but think, with Mr. Salisbury, Parad. 89, that this is a genuine *Arethusa*, agreeing precisely in habit with *A. bulbosa*. Few orchideous genera are more natural.

CALOSTEMMA, from *καλος*, beautiful, and *στεμμα*, a crown.—Brown Prodr. Nov. Holl. v. 1. 297.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Spathaceae*, Linn. *Narcissi*, Juss.

Eff. Ch. Petals six. Nectary with twelve segments, bearing the stamens. Berry globose, with one or two seeds. Distinguished from *PANCRATIUM*, as Mr. Brown observes, chiefly by the structure of the single-celled germen and pericarp. The flowers are small, not an inch long, either white or purple. The seeds germinate in the berry.

1. *C. album*. Br. n. 1.—Leaves elliptic-oblong, mostly solitary. Barren segments of the nectary linear, emarginate.—Native of the tropical part of New Holland.

2. *C. purpureum*. Br. n. 2.—Flower-stalk earlier than the leaves. Barren segments of the nectary triangular.—Found on the southern coast of New Holland.

CALOTHAMNUS, so named from *καλος*, beautiful, and *θαμος*, a shrub, and it well deserves the appellation.—Labill. Nov. Holl. v. 2. 25. Brown in Ait. Hort. Kew. v. 4. 417.—Clafs and order, *Polyadelphica Icosandria*. Nat. Ord. *Hesperidee*, Linn. *Myrti*, Juss.

Gen. Ch. *Cal*. Perianth half-superior, of one leaf, turbinate; limb in four or five short, broad, deciduous segments. *Cor*. Petals four or five, ovate, twice the length of the calyx, and alternate with its segments. *Stam*. Filaments very numerous, in four or five sets, opposite to the petals, the claw of each set flattened, oblong, many times longer than the corolla, some of them either combined together, or partially imperfect, pinnate, or otherwise many-cleft, in the upper part, with capillary segments; anthers terminal, inserted by their base, linear-oblong, undivided. *Pist*. Germen in the bottom of the calyx, small, roundish; style thread-shaped, erect, shorter than the stamens; stigma acute. *Peric*. Capsule coated with the base of the calyx, and firmly united to the branch, roundish, of three cells. *Seeds* numerous, small, oblong.

Eff. Ch. Calyx in four or five segments. Petals four or five. Stamens numerous, very long, in several various sets, opposite to the petals; anthers linear, undivided, vertical. Capsule coated by the calyx, three-celled, permanent. *Seeds* numerous.

Obf. The *stamens* in some species consist of uniform sets, answerable to the number of the *petals*; in others, two or more of those sets are partially combined laterally, the remainder being diminished to simple threads, without *anthers*, and this last is the character of the genus as M. Labillardiere underlood and described it. But Mr. Brown has, in conformity to nature and analogy, not limited it so strictly. We adopt his views of the genus, only begging leave to construct the essential character without exceptions, such phraseology being best avoided. The genus before us comes next to BEAUFORTIA, (see that article,) and is full as splendid, differing from it essentially in the structure of the *anthers*, and in having numerous seeds. From MELALEUCA, (see that article in vol. xxiii.) the difference is less striking, but we believe very essential, consisting in the vertical, not incumbent, *anthers*. To this Mr. Brown adds that the *inflorescence* is unilateral.

1. *C. sanguinea*. Blood-red Unequal Calothamnus. Labill. Nov. Holl. v. 2. 25. t. 164.—Flowers four-cleft. Sets of filaments combined; two of them imperfect, distinct. Adult leaves linear-awlshaped, compressed, smooth.—Native of Lewin's land, flowering in December. A *shrub*, six feet high, with round, scarred branches. Leaves feathered, slender, acute, entire, rather above an inch long; hairy when young. Flowers in small lateral sessile tufts, about the length of the leaves, conspicuous for their blood-red *stamens*, two sets of which unite to form a broad, wedge-shaped, concave body, divided at the top into numerous, vertical, parallel filaments, each bearing an upright linear *anther*; the two remaining sets diminished to simple, awl-shaped threads, without any *anthers*. Capsule small, globose.

2. *C. quadrifida*. Four-cleft Equal Calothamnus. Br. in Ait. n. 1. Sims in Curt. Mag. t. 1506.—Flowers four-cleft. Sets of filaments equal and distinct, with many anthers. Adult leaves smooth, as well as the fruit.—Gathered by Mr. Brown, on the fourth-west coast of New Holland. Sent to Kew in 1803, by Mr. Good, along with the two following. This bears splendid scarlet flowers, whose beauty however depends on the large *stamens*, an inch and a half long, the *petals* being small, pale, and inconspicuous. The leaves are linear-obovate, or somewhat spatulate, but extremely narrow, hardly more than an inch in length.

3. *C. villosa*. Hairy Five-cleft Calothamnus. Br. in Ait. n. 2.—Flowers five-cleft. Sets of filaments equal and distinct, with numerous anthers. Adult leaves villous, as well as the fruit.—Found by Mr. Brown on the fourth-west coast of New Holland. A green-house *shrub*, flowering at Kew, from July to September.

4. *C. gracilis*. Slender-leaved Calothamnus. Br. in Ait. n. 3.—Flowers five-cleft. Sets of filaments equal and distinct, with only three anthers to each. Leaves elongated and smooth, as well as the prominent capsule. Stem branched." Native of the same country as the last.

No other species have been hitherto described.

CALOTROPIS, from *καλο*, handsome, and *τροπις*, a keel, alluding to the beauty of the flower, and the keel-shaped leaves which compose its crown.—Brown Tr. of Wern. Soc. v. 1. 39. Ait. Hort. Kew. v. 2. 78.—Class and order, *Penandria Dignia*. Nat. Ord. *Corterie*, Linn. *Apocinea*, Juss. *Aclepiadeæ*, Br.

Eff. Ch. Corolla. Crown of the filaments simple, of five keel-shaped leaves, attached lengthwise to the tube of the

filament; recurved at the base. Masses of pollen ten, smooth, pendulous. Stigma pointless. Follicles tumid, smooth. Erect smooth milky *shrubs*, with broad opposite leaves, and handsome large flowers, in lateral corymbose panicles, inserted between the footstalks. Only two species are described.

1. *C. procerca*. Bell-flowered Auricula-tree. Ait. n. 1. (*Aclepias procerca*; Ait. ed. 1. v. 1. 305. Willd. Sp. Pl. v. 1. 1263. Schneev. Ic. t. 18. (See ASOLEPIAS, n. 29.) A. gigantea; Andr. Repof. t. 271. "Zja-raek; Le Brun Voy. 315. t. 184.")—Segments of the corolla spreading.—Native of Persia. A itove shrub impatient of damp and cold, flowering from July to September. The whole plant is glaucous, six or seven feet high, with broad, sessile, entire leaves. Flowers irregularly corymbose, numerous, larger than in most of this tribe, an inch or more in width, of a rich brownish-purple, powdered like an Auricula; pale beneath.

2. *C. gigantea*. Curled-flowered Auricula-tree. Ait. n. 2. (*Aclepias gigantea*; Linn. Sp. Pl. 312, excluding the synonyms of Plukenet and Alpinus. Willd. Sp. Pl. v. 1. 1264. (See ASOLEPIAS, n. 6.) Ericu; Rheeche Hort. Mal. v. 2. 53. t. 31.)—Segments of the corolla reflexed, with twisted points.—Native of sandy ground on the coast of Malabar. Very like the foregoing, but the corolla is differently shaped, as expressed in the character, and is said to be variegated with white and purplish-red, smelling like a lily. We beg leave to observe, that if priority of date were to determine generic names, without regard to the found regulations of Linnæus, Mr. Brown's elegant *Calotropis* must give way to Rheeche's *Ericu*, as the appellation of this genus, in spite of law, sense, taste, and convenience.

VOL. VI.

CALVERT, in *Geography*. Add—This county contained, in 1811, 8005 inhabitants, including 3937 slaves.

CALYPSO, in *Botany*, an elegant classical name of Mr. Salisbury's, from *καλυπτω*, to cover or conceal, not merely alluding to the covering of the stigma, but preserving a poetical analogy between this botanical beauty, so difficult of access, and the secluded goddess, whose life was fabled to be protected miraculously from the observation of navigators.—Salib. Parad. 89. Brown in Ait. Hort. Kew. v. 5. 208. Pursh 593.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Eff. Ch. Calyx-leaves and petals all turned upwards. Lip inflated, with a double spur in front. Column winged. Anther a terminal deciduous lid; masses of pollen four.

1. *C. borealis*. Northern Calypso; Salib. Parad. t. 89. Pursh n. 1. (*C. americana*; Br. in Ait. n. 1. Cypripedium bulbosum; Linn. Sp. Pl. 1347. Fl. Lapp. ed. 2. 257. t. 12. f. 5. Sm. Spicil. 10. t. 11. Orchis lapponensis monofolia; Rudb. Elyf. v. 2. 209. f. 10. Serapias scapo unifloro; Gmel. Sib. v. 1. 7. t. 2. f. 1.)—Native of Russia, and Ostrobothnia, (Linn.) Nova Scotia, and several parts of the west coast of North America. *Menzies*. Found on the banks of the Columbia river, by governor Lewis. *Pursh*. Root of a few aggregate bulbous knobs. Leaf solitary, radical, ovate, many-ribbed, spotted. Stalk scaly, three to six inches high, bearing one large, beautiful, crimson flower, with a purplish lip, bearded with yellow. We have in vain sought for any permanent specific difference between the American and European plant.

CALYSTEGLIA, a genus separated by Mr. Brown, Prodr. Nov. Holl. v. 1. 483, from *Convolvulus*, and chiefly distinguished by the great size of the two leafy bractæ, including

including the calyx, whence the name, from $\kappa\alpha\lambda\upsilon\zeta$, and $\sigma\tau\upsilon\alpha$, to cover. *Convolvulus sepium* and *C. Soldanella* of Linnæus, with several others, constitute this genus, which appears to us better omitted.

CALY-YUG, denotes, according to the chronology of the Hindoos, the present or fourth age of the world.

CAMALODUNUM, l. 3, r. Trinouantes.

CAMBERWELL, a parish of Brixton hundred, in the county of Surrey, which includes the hamlets of Dulwich and Peckham; and in 1811 contained 1849 houses, and 11,309 persons; viz. 4854 males, and 6455 females; but since that time much increased in buildings and inhabitants.

CAMBIUM, l. 31, for CORTICAL LAYERS *r.* CORTEX; l. 39, for PITH and MEDULLARY CANAL *r.* MEDULLA. Col. 2, l. 5, r. MONOCOTYLEDONES.

CAMBRIA, in *Geography*, a county of Pennsylvania, containing 2117 inhabitants.—Also, a township of the same county, having 868 inhabitants.

CAMBRIDGE, col. 4, l. 7, add—By the return in 1811, the borough and university of Cambridge contained 1901 houses, and 11,108 persons; viz. 5288 males, and 5820 females: 80 families employed in agriculture, and 1600 in trade and manufactures.

CAMBRIDGE, in Washington county, &c. l. 2, r. census of 1810, 6730 inhabitants, and 650 senatorial electors; l. 10, for 2115 *r.* 2323; l. 38, *r.* 990.

CAMBRIDGE, a town of Guernsey county, in Ohio, having 474 inhabitants.

CAMBRIDGE, *West*, a township of Middlesex county, Massachusetts, having 971 inhabitants.

CAMBRIDGESHIRE, col. 1, l. *ult. r.* In 1811, this county contained 17,489 houses, and 101,109 persons; viz. 50,756 males, including 2946 local militia, and 50,353 females: 12,831 families employed in agriculture, and 5303 in trade, manufactures, and handicraft.

CAMDEN, a county of North America, l. 3, for 4033 *r.* 5347.

CAMDEN, a county in Georgia, &c. l. 3, r. containing 3941 inhabitants, of whom 2681 are slaves.

CAMDEN, in the district of Maine, contains 1607 inhabitants.

CAMDEN, a post-township of Oneida county, in the state of New York, watered by the W. branch of Fish creek, containing about 1100 inhabitants, principally farmers from Connecticut.

CAMELINA, in *Botany*, an old name of French origin, used by Dodonæus, but whether it alludes to this plant's being the companion of flax, *Linum*, as Crantz seems to intimate, is hardly worth enquiring.—Crantz *Austr. fasc. 1. 17.* Brown in *Ait. Hort. Kew. v. 4. 93.*—Class and order, *Tetradynamia Siliculose*. Nat. Ord. *Siliquose*, Linn. *Cruciferae*, Juss.

Eff. Ch. Pouch nearly ovate, many-seeded: valves tumid. Cotyledons incumbent. Filaments without teeth. *Brown.*

Mr. Brown finds this genus on the *Myagrum fativum* of Linnæus, and the *M. (not Alyssum) austriacum* of Jacq. *Austr. t. 111.* The first is the only *Camelina* of Crantz above cited, who distinguishes it from *ALYSSUM*, (see that article,) by the connection between the *style* and the valves of the *pouch*, the *style* of *Alyssum* being connected with the *partition* only. Mr. Brown's distinction depends chiefly on the position of the *cotyledons*; for every *Alyssum* has not toothed filaments. Of *Myagrum austriacum* we do not feel competent to judge, but we are disposed to keep the *fativum* an *Alyssum*, as in *Fl. Brit. and Engl. Bot. t. 1254*, unless it could be set apart along with *Alyssum utriculatum* of Linn.

Curt. Mag. t. 130. one species of Mr. Brown's and Lamarck's *Vesicaria*, very different from the original *VESICARIA* of Tournefort; see that article.

CAMPBELL, l. 3 and 4, r. 11,001 and 5368.

CAMPBELL, a town of Kentucky, containing 3060 inhabitants, of whom 438 are slaves.

CAMPBELL-Town. Add—The burgh and parish, in 1811, contained 1010 houses, and 7807 persons; viz. 3367 males, and 4440 females.

CAMPDEN, col. 2, l. 23 from the bottom, add—In 1811, it was stated to contain 273 houses, and 1214 persons; viz. 594 males, and 620 females.

CAMPION, l. 5, r. 873.

CAMPYNEMA, in *Botany*, so named by Labillardiere, "from $\kappa\alpha\mu\pi\upsilon\lambda\omicron\varsigma$, curved, and $\nu\eta\mu\alpha$, a filament," see the character.—Labill. *Nov. Holl. v. 1. 93.* Brown *Prodr. Nov. Holl. v. 1. 290.*—Class and order, *Hexandria Trigynia*. Nat. Ord. *Alphodeles*, but doubtful, *Br.*

Eff. Ch. Petals six, superior, permanent. Filaments and styles recurved. Capsule of three cells, bursting at their inner angle. Seeds numerous, depressed, spongy.

I. C. linearis. *Br. n. 1.* Labill. t. 121.—Native of Cape Van Diemen. A smooth herb, with a root of several tapering fibres. Leaves grassy, alternate, half-clasping the stem. Flowers terminal, erect, either solitary, or from two to four in a lax cluster. Anthers versatile, heart-shaped. Stigmas simple. Seeds in a simple row, attached to the inner angle of each cell. Nothing is said of the colour of the flower.

CANAAN, l. 2, for Lincoln *r.* Somers; l. 4, *r.* 1275; l. 7, *r.* 1810 and 1094; l. 12, add—In 1810, it contained 2203 inhabitants; l. 13, add—with 232 inhabitants.—Also, a township of Wayne county, in Pennsylvania, having 829 inhabitants.

CANAAN, *New*, a town of Fairfield county, in Connecticut, having 1599 inhabitants.

CANAL, col. 14, l. 44, add—The principal interior canals that are already (1818) completed in the United States are, the Middlesex canal, uniting the waters of the Merrimack river with the harbour of Boston, and the canal Carondelet, extending from Bayou St. John, a post of delivery in the Mississippi district, to the fortifications or ditch of New Orleans, and opening internal communication with lake Pontchartrain. The union of this canal by lakes with the Mississippi would, independently of other advantages, enable the government to transport with facility and effect the same naval force for the defence both of Mississippi and lake Pontchartrain, the two great avenues by which New Orleans may be approached from the sea. In 1816 or 1817, the state legislature of New York passed acts, appropriating funds for opening a navigable communication between the lakes Erie and Champlain and the Atlantic ocean, by means of canals, connected with the Hudson river. When this scheme, actually begun, is accomplished, and a communication opened by canals and lakes between lake Erie and the navigable waters of Hudson's river, and also between lake Champlain and these waters, the state of New York will soon become, in itself, a powerful empire.

Sheet Q q, instead of CANAL at the head of the page, insert in col. 1 and 2, CAN.

CANAL, p. 44, col. 2, l. 6 from the bottom, for thereon *r.* therein. P. 49, col. 1, l. 20, add—Mr. Chapman has lately (*viz.* in 1816) suggested to the editor, that this method, without complicated collateral aid, not had in contemplation, will be found to be impracticable; because the moment the descending crison entered the lower canal, the equilibrium

equilibrium would be lost, and all counterbalance when the crifton had entered to such depth as to allow its contained vesfel to go out.

For HARTLEPOOL CANAL *r.* HARTLEY CANAL; for Durham *r.* Northumberland; and for Hartlepool *r.* Hartley.

CANAL, *Basing floke*, col. 2, l. 3, after commences in, infert—Cooper's meadow, adjoining to the town of Basing-floke, and enters the river Wey about two miles above Weybridge; *dele*, l. 3, 4, 5, from Wey to Basingfloke; l. 18, after Loden, add—The proprietors are prohibited from touching the Loden, or any of the springs or streams that feed it.

CANANDAQUA, or CANANDAIGUA, l. 11, *r.* In 1810, this township had 415 families, 206 senatorial electors, and 2302 inhabitants.

CANDARINE, a money of account in China, where 1 tale is = 10 marcs = 100 candarines = 1000 cash.

CANDLES, *Laws relating to*, col. 1, l. 2, add—By 49 Geo. III. c. 98. duties of customs are likewise imposed; l. 8, *r. c. 9.*

CANDY, a weight in the East Indies. At Madras the candy is 500 lbs. avoirdupois, = 20 maunds. See MAUND.

CANFIELD, in *Geography*, a township of Trumbull county, in Ohio, having 494 inhabitants.

CANHADA, a liquid measure in Portugal, 6 canhadas being = 1 pote, *r.* See ALMUDA.

CANICULAR YEAR, c. 2, l. 16, for in *r.* on.

CANNA, or CANNE, a measure for cloth in Italy, and the fourth of France, Spain, &c. each canna at Barcelona being = 61.4 English inches; at Florence, = 93.1 English inches for woollen and 91.7 for silk; at Genoa, = 116.7 English inches; at Majorca, 67.5; at Malta, 81.9; at Marseilles, 79; at Montpellier, 79.8; at Morocco, 20.1; at Naples, 83; at Palermo, 76.2; at Saragossa, 81.5; at Toulouse, 71.7.

CANNAUGHQUANESING, in *Geography*, a township of Butler county, in Pennsylvania, having 1284 inhabitants.

CANO, l. 3, *r.* 1601; l. 7, after Seville, and under Juan Martinez Montanes; l. 26, infert—In 1643 he removed to Toledo; and upon, &c.

CANTERBURY. This city, by the return of 1811, contained 2093 houses, and 10,200 inhabitants; *viz.* 4605 males, and 5595 females: 508 families being employed in agriculture, and 1194 in trade and manufactures.

CANTERBURY, a township of America, &c. l. 5, for 1038 *r.* 1526, including 7 slaves; l. 8, add—It contains 1812 inhabitants.

CANTHARIDIN, in *Chemistry*, a name given by Dr. Thomson to a peculiar principle extracted from cantharides in the following manner.

Boil cantharides in water till every thing soluble in that liquid be taken up. Concentrate the solution by evaporation, and when reduced to a thick syrup, boil it repeatedly in alcohol, till that fluid ceases to act upon it. Evaporate the alcoholic solution to dryness, and digest the dry residue in sulphuric ether. When the ether has assumed a yellow colour decant it, and expose it in an open vessel to spontaneous evaporation. Small crystalline plates mixed with yellow matter will soon separate. The yellow matter may be separated by alcohol, which leaves the crystals of cantharidin quite pure.

Cantharidin thus obtained exists in the form of shining micaceous plates. It is insoluble in water, and in cold alcohol. Boiling alcohol dissolves it, but the cantharidin again separates on the cooling of the alcohol. Ether dissolves it, but not in large quantities. It readily dissolves in

oils, and when applied to the skin, acts as a vesicatory with great energy. The solution of it in oils is equally efficacious. This principle seems to have been first separated by Thouvenel. See CANTHARIDES.

CANTHARIS, *l. ult. dele* which see respectively.

One of the most elegant insects of this genus is the scarlet cantharis; entirely of a vivid red, except the body, legs, and antennæ, which are coal-black. It is somewhat more than half an inch in length. The *C. bipustulata* is a beautiful insect, somewhat smaller than the preceding, of a very dark but elegant gilded green, with the tips of the wings shells red, and on each side of the thorax a triple vesicle of a bright red colour, capable of extension or retraction at the insect's pleasure, and by the microscope exhibiting an alternate inflation and contraction, like that of the lungs in the larger animals. This species is found in the middle of summer on various plants, and particularly on nettles. Shaw.

CANTICLES, col. 3, l. 16, *r.*—The causes of the apparent, &c.

CANTON, in America, add—and containing 1355 inhabitants.—Also, a town of Hartford county, in Connecticut, having 1374 inhabitants.—Also, a township of Luzerne county, in Pennsylvania, having 417 inhabitants.—Also, a township of Washington county, in the same state, containing 1345 inhabitants.—Also, a town of Stark county, in Ohio, having 846 inhabitants.

CANTON, in China, l. 17, after houses, infert—built of brick. Col. 2, l. 1, add—These *sampans*, as they are called, accommodate, at the very lowest computation, 40,000 people: l. 13, after 40,000, add—The accounts of the population of Canton are very various and contradictory. The exaggerated statement above given is that of Le Comte. Du Halde estimates it at a million; and Sonnerat, erring in the other extreme, reduces the number to 75,000. But according to data, collected by captain King, in “Cook's Third Voyage,” (vol. iii.) he apprehends, that the city and suburbs may probably contain about 150,000.

CAOUTCHOUC, in *Chemistry*. In addition to what has been said of this singular substance, we may observe that it has been lately stated to exist in a great variety of plants, though it has been hitherto usually confounded with other substances. It may be separated from resins by means of alcohol. It may be extracted from the different species of mistletoe by water, with which it readily combines, whilst in that fluid state in which it exists in these plants. When mixed with gum or extractive, it may be separated by digesting a part of the plant containing it, first in water, and then in alcohol, till all the substances soluble in these liquids be extracted. The residuum is then to be dried and digested in four times its weight of rectified petroleum. Express the liquid part by squeezing the substance in a linen cloth. The liquid is then to be put by for some days to settle, and after the clear part has been poured off, the remainder is to be mixed with a third part of water, and distilled. The caoutchouc remains behind.

According to Bucholz, a considerable proportion of caoutchouc exists in opium. Mastic also is stated to contain a substance very similar to caoutchouc.

CAPELAT, or CAPELLAT, a name sometimes given by farriers to a swelling of a wenny kind, which grows on the hock of a horse, and on the point of its elbow. It often arises from bruises, and in this case should be bathed with hot vinegar and alum; but when they grow gradually on both heels and elbow, blood is extravated. When this happens, suppuration should be promoted by rubbing the part with stimulating unguents; and when matter is formed, the skin should be opened with a lancet, in more dependent

parts towards one side, for avoiding a scar. The subsequent dressings may be turpentine, honey, and tincture of myrrh.

CAPEMAY, in *Geography*, a county of New Jersey, containing 3632 inhabitants, of whom 81 are slaves.

CARAGE of Lime, denotes the quantity of sixty-four bushels.

CARALLIA, in *Botany*, *Carallie* of the Telingas, or natives of Hindoostan; being one of those barbarous names which some modern botanists have ventured to tolerate, but which no classical one can approve.—Roxb. *Coromand.* v. 3, 8.—Clafs and order, *Isofandria Monogynia*. Nat. Ord. *Hesperidee*, Linn. *Myrtis*, Juss.

Ess. Ch. Calyx in six or seven segments, superior. Petals six or seven. Stigma three-lobed. Berry of one cell, with a solitary seed.

1. *C. lucida*. Shining *Carallia*. Roxb. as above, t. 211.—Native of the lower region of the Circar mountains. A small, handsome, evergreen tree, flowering in March and April. *Leaves* on short stalks, opposite, elliptical, acute, finely serrated, smooth, four or five inches long, and two or two and a half broad. *Flowers* small, yellow, in little, aggregate, axillary, stalked heads. *Berry* the size of a pea, reddish. *Seed* large, with a strongly curved embryo. Nothing is recorded of the qualities or uses of this plant. It is evidently next akin to *EUGENIA*; see that article.

CARAWAY, *r. CARUM*, &c.; at the end of the next article *r. CARUM*.

CARBON, in *Chemistry*. The progress of chemical knowledge enables us to state, with greater accuracy and precision, the nature of some of the compounds of carbon, than at the period when this article in the Cyclopædia was written.

Carbonic Oxyd.—It has been shewn by Gay Lussac, that 100 measures of this gas require for complete combustion 50 measures of oxygen, and that the product is 100 measures of carbonic acid; hence it must be composed of one atom of carbon and one atom of oxygen, or 100 parts by weight will consist of

Oxygen	-	-	-	57.14
Carbon	-	-	-	42.86
				100.00

And its true specific gravity must be .9722, and 100 cubic inches of it must weigh, at a mean temperature and pressure, 29.652 grains. Carbonic oxyd has the property of combining with chlorine, and forming a peculiar compound, which its discoverer, Dr. Davy, has named *PHOSGENE gas*; which see.

Carbonic Acid.—When pure charcoal is burnt in oxygen gas, it has been shewn that the original bulk of the oxygen suffers no change. Hence it is obvious, that, by subtracting the specific gravity of oxygen from that of carbonic acid gas, we shall obtain the quantity of carbon existing in it. The specific gravity of oxygen gas is 1.11, and that of carbonic acid 1.52. Hence 100 parts, by weight, of carbonic acid will consist of

Oxygen	-	-	-	72.73
Carbon	-	-	-	27.27
				100.00

which correspond with two atoms of oxygen and one of carbon. See *ATOMIC THEORY*.

Carburetted Hydrogen.—The specific gravity of carburetted

hydrogen, according to Dr. Thomson, is .5555, and 100 cubic inches of it weigh 16.99 grains. It requires for its complete combustion twice its volume of oxygen gas, and produces exactly its own volume of carbonic acid; the only remaining product is water. Hence 100 parts, by weight, of this gas are composed of

Carbon	-	-	-	75
Hydrogen	-	-	-	25
				100

which correspond with one atom of carbon and two of hydrogen.

Olefiant Gas.—The specific gravity of this gas, according to Dr. Thomson's experiments, is .974, and 100 cubic inches of it weigh 29.72 grs. It requires for its complete combustion three times its volume of oxygen gas, and produces, when burnt, twice its volume of carbonic acid gas, and a certain proportion of water. Hence 100 parts, by weight, of this gas are composed of

Carbon	-	-	-	85.71
Hydrogen	-	-	-	14.29
				100.00

which correspond with one atom of carbon and one of hydrogen.

The curious oil-like compound formed by the union of this gas with chlorine, has been lately examined by MM. Robiquet and Colin. They found that it is composed of one volume of chlorine united with one volume of olefiant gas, and of course that its constituents, by weight, are

Olefiant gas	-	-	-	16.28
Chlorine	-	-	-	83.72
				100.00

This oily liquid, which Dr. Thomson considers as a sort of *ether*, and hence names it *chloric ether*, burns with a green flame, and at the same time gives out copious fumes of muriatic acid and much foot. Its specific gravity at 45° is 1.2201, water being 1.000. It boils at 152°. At the temperature of 49°, its vapour is capable of supporting a column of mercury 24.66 inches in height. The specific gravity of this vapour was found by experiment to be 3.4434, which very nearly coincides with the above account of its composition. When passed through a red-hot porcelain tube it is decomposed and converted into muriatic acid, and an inflammable gas containing hydrogen and carbon, while a copious deposit of charcoal is found in the tube. It is also decomposed when passed through red-hot oxyd of copper.

With respect to the *carbonates*, the numbers representing them will of course require a little adjustment; this can be easily done from the composition of carbonic acid stated above, and from the data given under *ATOMIC THEORY*.

CARBONIC Acid Gas, col. 2, l. 5, add—According to the accurate experiments of Messrs. Allen and Pepys, recorded in the Phil. Transf. the weight of a cubic inch of this gas is .464 of a grain. Col. 3, l. 46, *r. milkiness*.

CARDAMOM, l. 2, insert after *Cardamom, angustifolium, grana Paradisa*, &c.

CARDIFF, col. 2, l. 9, insert after *canal*—The town-hall of Cardiff is a respectable modern building, and near it

is the county gaol, built upon Mr. Howard's plan; l. 14.—By the parliamentary return in 1811, the number of inhabitants is stated at 2457. The only manufactory established here is that of iron hoops: the trade, however, is very considerable, in consequence of the numerous collieries up the vale, and the iron and tin works of Merthyr, Melin Gruffydd, &c. the produce of which is conveyed here by the canal for exportation, and which creates a large import trade from Bristol, &c., in shop goods to supply the consumption of the interior country. There are regular passage-boats twice a week from this place to Bristol.

Cardiff is a borough-town, and in conjunction with the contributory boroughs of Cowbridge, Llantrissant, Keafig, Aberavon, Neath, Swansea, and Loughor, sends one member to parliament.

CAREX, col. 4, l. 11, *r. banana*.

CAREYA, in *Botany*, named by Dr. Roxburgh, "after its discoverer Mr. William Carey, a good botanist, and a promoter of natural history in general."—Roxb. Coromand. v. 3, 13. Ait. Hort. Kew. v. 4, 236.—Clafs and order, *Monadelphia Polyandria*. Nat. Ord. *Hesperideæ*, Linn. *Myrti*, Juss.

Ess. Ch. Calyx superior, four-cleft. Petals four. Style one. Germen of four cells. Berry with numerous seeds, imbedded in pulp.

1. *C. herbacea*. Herbaceous Careya. Roxb. as above, t. 217. Ait. n. 1.—Herbaceous. Flowers stalked. Outer filaments longest and without anthers.—Native of Rungpore, in Bengal, flowering in February. Root woody, perennial. Stems a span high, annual, round, smooth. Leaves opposite, obovate, crenate, smooth, from four to eight inches long, on short stalks. Flowers terminal, corymbose, few, large and very beautiful, the calyx and petals greenish, tinged with red; the outer row of their innumerable stamens crimson, capillary, two inches long, recurved, without anthers, about twice the length of the obovate petals. Berry brown, the size and texture of a medlar.

2. *C. arborea*. Tree Careya. Roxb. as above, 14. (Pelou; Rheede Hort. Malab. v. 3, 35, t. 36.)—Arborescent. Flowers sessile. Inner filaments shortest, and without anthers.—Native of the valleys, in various mountainous parts of India. A large tree, with obovate, slightly serrated, smooth, deciduous leaves, from six to twelve inches long. Flowers crowded, pale yellow, appearing with the young leaves in March. Fruit the size of a small orange, fetid and nauseous till quite ripe, when the pulp becomes sweetish, but Rheede reports it to be poisonous, which, considering its affinity to *Psidium*, is not credible. Dr. Roxburgh gives no account of this matter, but describes the wood as the colour of mahogany, though less hard and close. The fibrous bark makes tough and durable ropes.

CARGA, a measure for wine and oil at Barcelona, equal to 2½ quarters.

CARGADOR, in Portugal and Holland, denotes a ship-broker.

CARGILIA, in *Botany*, is dedicated to the memory of Dr. James Cargill of Aberdeen, a contemporary of Caspar Bauhin, in whose *Prodromus*, p. 154, 155, (Mr. Brown by mistake refers to his *Theatrum*,) several descriptions of *Fuci*, communicated by Dr. Cargill in 1603, may be seen.—Brown Prodr. Nov. Holl. v. 1, 526.—Clafs and order, *Polygamia Dioecia?* rather *Oöandria Monogynia*. Nat. Ord. *Ebenaceæ*, Juss. Br.

Ess. Ch. Calyx inferior, half-fourcleft. Limb of the corolla four-cleft. Stamens inserted into the base of the corolla; filaments doubled. Germen of four cells, with two seeds in each. Berry globose, closely invested with

the cup-shaped calyx.—Some flowers have fewer, and imperfect, stamens; others only the rudiment of a pistil.

This genus is intermediate between *Diospyros* and *Maba*. See those articles.

1. *C. laxa*.—Leaves oblong, rather wavy, smooth. Calyx of the male flowers four-toothed, half as long as the tube of the corolla. Style in three or four deep segments. Young branches lax.—Found by Mr. Brown in the tropical part of New Holland.

2. *C. australis*.—Leaves oblong, smooth, obtuse, pale beneath; acute at the base.—Calyx of the male flowers four-cleft, as long as the tube of the corolla. Style undivided. Found by Mr. Brown, in New South Wales.

CARL D'OR, a gold coin of Brunfwick, of which there are double, single, and half carl d'ors; that since 1802 containing 92 gr. of pure gold, and equal 16s. 3½d. sterling. The double in proportion. See COIN.

CARLIN. Add—See TARO.

CARLISLE, col. 5, l. 27, add—By the return of 1811, the city of Carlisle contained 1658 houses, and 12,531 persons; viz. 5628 males, and 6903 females: 134 families employed in agriculture, and 2301 in trade, manufactures, and handicraft.

CARLISLE, the chief town of Cumberland county, &c.;—l. 6. By the census of 1810, Carlisle borough contains 2491 inhabitants, including 78 slaves.—Also, a town of Middlesex county, in Massachusetts, having 672 inhabitants.

CARMELITES. Add—see Manchester Memoirs, vol. v.

CARN, or CAIRN. See CARNEDDE.

CARNESVILLE. Add—see FRANKLIN.

CAROLIN D'OR, or CAROLIN, a gold coin of Bavaria, Hesse Darmstadt, and Wurtemberg, valued at 11 florins. See COIN.

CAROLINA, *N. and S.* See UNITED STATES.

CAROLINE, l. 4, *r.* 17, 544; l. 5, *r.* 10, 764; l. 8, *r.* 9453; l. 10, *r.* 1520.

CARORA, l. 2, insert—15 leagues E. of Maracaybo lake, in N. lat. 10°. The town is tolerably well built; the streets are large and on a line; the air is salubrious, though the soil is parched; the inhabitants, amounting to about 6200, live on the produce of their flocks and herds, and employ themselves in tanning and dressing the hides and skins, which are used in the city for boots, shoes, saddles, bridles, and curriery. The surplus of the local consumption is spread over the province, or is conveyed to Maracaybo, Carthagena, and the island of Cuba. They also make, with a kind of fibre (*aloe distichas*) very good hammocks, which furnish an article of commerce. Depons.

CARPATHIAN MOUNTAINS, l. 22, *r.* Zemnitz.

CARPHA, in *Botany*, so named by sir Joseph Banks and Dr. Solander, from *carphæ*, dry straw or chaff, in allusion to the habit of this genus.—Brown Prodr. Nov. Holl. v. 1, 230.—Clafs and order, *Triandria Monogynia*. Nat. Ord. *Calamariæ*, Linn. *Cyperaceæ*, Juss. Br.

Ess. Ch. Spikelet single-flowered; scales imperfectly two-ranked, the lower ones empty. Bristles three to six, beneath the germen, as long as the fertile scale. Style avl-shaped, without a joint, crowning the prismatic nut. Stigmas two or three.

Seçt. 1. Spikelets two-ranked. Stigmas three. Nut triangular. Bristles feathery.

1. *C. alpina*.—Spikelets in a corymbose cluster. Bristles six, feathered nearly to the top. Stem leafy, smooth. Leaves rough.—Native of Van Diemen's island.

2. *C. deuffa*.—Tuft terminal. Involucrum of two elongated

gated leaves; dilated and membranous at the base. Bristles three, feathery at the base. Stem leafless. Leaves radical, almost bristle-shaped.—Native of Port Jackson.

These, with a non-descript species from Terra del Fuego, constitute, in Mr. Brown's opinion, the genuine genus of *Carpha*, the following being perhaps entitled to form one by themselves.

SECT. 2. *Spikelets acul-shaped. Style elongated, in two divisions. Nut nearly cylindrical.*

3. *C. avenacea*.—Panicle somewhat spiked. Scales with awn-like points. Bristles four, slightly toothed; fringed at the base. Stem roundish, leafy.—Native of the fourth coast of New Holland. *Stamens* three.

4. *C. diandra*.—Panicle dense. Spikelets two-flowered. Scales with awn-like points. Stamens two. Bristles five or six, capillary, toothless; fringed at the base. Stem roundish, leafy.—Found at Port Jackson.

5. *C. claudiflora*.—Spike elongated. Sheaths alternate. Spikelets in pairs, concealed. Stem round, leafy.—Found on the fourth coast of New Holland.

CARRICK. See *TRANKET*.

CARTER, l. 1, infert E. Tennessee. Add—It contains 1l. 4s. 6d. See *TAX*.

CARTERET, in Carolina, &c., l. 3, r. 4823; l. 4, r. 4190 inhabitants, 202 being slaves.

CARTS, *Laws relating to*, col. 3, l. 49, for 1l. 4s. r. 1142.

CARTHAMUS, *Chemical Properties of*. Many experiments have been made on the colouring matter extracted from this plant. The last and most interesting are those of Dufour and Marchais, of which we shall present our readers with a short account.

The flowers of the carthamus contain two colouring matters; a yellow, which is soluble in water, and has hitherto been applied to no use; and a red, which is employed by the dyers, &c., and which constitutes the pigment called *rouge*. The yellow colouring matter readily dissolves in water, but it is difficult to separate the whole of it. Dufour effected this by exposing the carthamus wrapt up in a piece of linen to the action of a stream of water. To separate the red colouring matter, he macerated for an hour the carthamus, after it had been thus washed, in a weak solution of carbonate of soda. Into this solution was put a quantity of cotton, and lemon-juice was then dropped into it till the liquid assumed a fine cherry-red colour. After standing twenty-four hours, the liquid lost its red colour, the whole colouring matter having combined with the cotton, and dyed it red. The cotton was taken out and well washed, to separate a little of the yellow colour adhering to it. It was then put into a very dilute solution of carbonate of soda. This alkali separated the colouring matter from the cotton, dissolved it, and assumed a yellow colour; the cotton being removed and lemon-juice dropped into the solution, a fine rose-coloured powder gradually separated, and at last precipitated. This was the red colouring matter. This red colouring principle is insoluble in water and oils, but is soluble in alcohol and ether. The alkalies also dissolve it, but destroy its colour. When distilled, it yields a little water, scarcely any gas, a little oil, and a portion of charcoal, equal to one-third of the original weight. When this charcoal is burnt it leaves no ashes. One thousand parts of carthamus yielded only five of this red colouring matter, but no less than 268 of the yellow colouring matter above-mentioned. Carthamus also contains a great variety of other substances according to Dufour, many of which, such as alumina, sand, &c., are evidently foreign. It is probably in some such manner as the above that the *pink saucers* are

prepared from carthamus, though we believe the exact process is kept secret.

CARTILAGE, *Chemical Properties of*. See *BONE*.

CARTONEMA, in *Botany*, from *καρπίς*, *stern*, and *μαζα*, a filament.—Brown Prodr. Nov. Holl. v. 1. 271.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Compositæ*, Br.

Eff. Ch. Calyx three-leaved, permanent. Petals three, smaller. Filaments equal, permanent, beardless, partly roughish. Anthers oblong, vertical. Style permanent. Stigma bearded. Capsule shorter than the calyx, of three cells and three valves, with central partitions. Seeds one or two, with a dorsal embryo.

1. *C. spicatum*.—Found by Mr. Brown in the tropical part of New Holland. *Root* perennial, tuberous below the fibres. *Herb* clothed with lax hairs, much resembling *PHILYDRUM* in appearance. *Stem* leafy, simple, or slightly branched. *Leaves* linear, clasping, elongated. *Spike* terminal, of many yellow flowers, each with two unequal, leafy, permanent bracts. The habit, as well as the permanent *stamens* and *style*, lead Mr. Brown to suspect some affinity to *Philydrum*. Hence perhaps the true place of that puzzling genus may be discovered.

CARVER, in *Geography*. Add—It contains 358 inhabitants.

CASBIN, infert—or CASWEEN, l. 11, after broad, add—it may still, however, be regarded as one of the largest and most populous towns in the kingdom, and carries on a great trade with Ghilan.

CASEY, a county of Kentucky, containing 3252 inhabitants, of whom 237 are slaves.

CASH, a small coin in China, and India beyond the Ganges. See *TALE*.

CASHIERING, in *Military Language*. An officer sentenced by a general court-martial, or peremptorily ordered by the king, to be dismissed from the service, is said to be cashiered.

CASSAVA, or TAPIOCA, *Chemical Properties of*. This is prepared from the roots of the *JATROPIA manibot*, an American plant. (See *JATROPHA*.) These are peeled and subjected to pressure in a bag made of rushes. The expressed juice is a virulent poison, and is employed by the Indians for poisoning their arrows; but it deposits gradually a white powder, which has all the properties of starch, and which, when washed and dried, is perfectly harmless, and highly nutritive. What remains in the bag also consists chiefly of the same starch. It is dried in smoke, and afterwards pressed through a kind of sieve. Of this substance, the *cassava bread*, so much employed in the West Indies, is made.

CASSINIA, in *Botany*, dedicated by Mr. Brown to his learned fellow-labourer in the study of compound flowers, M. Henry Cassini, two of whose Memoirs on their stamens and style have appeared in the French Journal de Physique, for 1813 and 1814.—Br. in *Ait. Hort. Kew.* v. 5. 185.—Class and order, *Syngenesia Polygamia-segregatae*. Nat. Ord. *Compositæ*, Linn. Br.

Eff. Ch. Partial calyx four-leaved, two-flowered. Florets all perfect. Seed-down chafy, tufted. Partial receptacle naked.

1. *C. aurea*. Yellow Cassinia.—Native of the fourth coast of New Holland. *Br.* Seeds were sent to Kew, by Mr. Good, in 1803. The plant is marked as a green-house perennial herb, flowering in July and August, but we have no account of its habit or appearance.

CAST, for BRAHMINS r. BRACHMANS.

CASTELLANO, a weight for gold in Spain, is 50 castellanos

lanos being = 400 tomines or 4800 grains. Silver is weighed by the fame mark of 50 castellanos, divided into 8 ounces, 64 ochavos, 128 adarnes, 384 tomines, or 4608 grains.

CASTINE. Add—It contains 1036 inhabitants.

CASTLE, NEW. See NEWCASTLE.

CASTLE-CARY, l. 8, add—By the returns of 1811, the parish contained 281 houfes, and 1406 inhabitants; 650 being males, and 756 females.

CASTLE-RISING. By the returns of 1811, the borough and parish contained 48 houfes, and 297 perfons; viz. 148 males, and 149 females.

CASTLETON, l. 9, r. 1420.

CASTLE-TOWN, a township of America, &c. l. 2, which contained, by the census in 1810, 1301 inhabitants, and 121 fenatorial electors. Here are three houfes for public worship, and fome school-houfes.

CASTOR. By the returns of 1811, the parish contained 185 houfes, and 1051 perfons; 487 being males, and 564 females.

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CASWELL, l. 3, r. 11,757 and 4299.

CATAHULA, a parish of the territory of Orleans, having 1164 inhabitants.

CATALPA, in *Botany*, a well-founding barbarous name, which Linnæus in Hort. Cliff. 317, could trace no further than the gardeners of that day, nor are we acquainted with its origin or meaning.—Just. Gen. 138. Dryand. in Ait. Hort. Kew. v. 1. 24. Pursh 10.—Clafs and order, *Diandria Monogynia*. Nat. Ord. *Perfonate*, Linn. *Bignonia*, Juss.

Eff. Ch. Corolla five-cleft, irregular. Calyx in two deep segments. Three barren stamens. Capsule of two cells. Seeds with a membranous jagged wing at each end.

1. *C. fyringifolia*. Common Catalpa. Sims in Curt. Mag. t. 1094; and

2. *C. longissima*. Wave-leaved Catalpa. (*Bignonia longissima*; Willd. Sp. Pl. v. 2. 290.) are the two described species. (See *BIGNONIA* n. 1 and n. 22.) We have heard that Dr. Solander, who was first aware of this genus, and who would certainly never have admitted to unauthorized a name as *Catalpa*, was very desirous of having it called *Solandra*.

CATAWESSY. Add—It contains 1934 inhabitants.

CATHARINE II., col. 3, l. 40, for Persian r. Prussian.

CAT'S-EYE. See MINERALOGY, *Addenda*.

CATTY, a weight at Canton, in China, and in some parts of India. The catty or gin of 16 lyangs or tales weighs 19 oz. 6 dwts. 4 grs. English troy, so that 10 tales would weigh 5792 English grains. See TALE.

CAVALLO, TIBERIUS, F.R.S., in *Biography*, the son of an eminent physician of Naples, where he was born in 1759. Destined for commerce, he came to England for the purpose of acquainting himself with the principles of commerce in 1771; but literature and philosophy diverted his destination and enjoyed his preference. To those who were engaged in pursuits similar to his own, and to the editor of this Cyclopædia, he was a very useful coadjutor. His publications on a variety of philosophical subjects, and his communications to the Royal Society, were numerous, and are well known; particularly his “Elements of Natural and Experimental Philosophy,” 1803, 4 vols. 8vo. He died, much respected and esteemed, and with the editor's sincere regret, in London in 1810.

CAUCUS, a term used in North America for a kind

of electioneering committee; *caucus*, as it is said, denoting electioneering. Of the origin of this uncouth term we have the following account in Gordon's Hist. of the Amer. Rev. London 1788. “About the year 1738, the father of Samuel Adams, and twenty others who lived in the north or shipping part of Boston, used to meet to make a *caucus*, and lay their plan for introducing certain perfons into places of trust. Each distributed the ballots in his own circle, and they generally carried the election. As this practice originated in the shipping part of Boston, *caucus* might have probably been a corruption of Caulker's meeting.” See Pickering's American Vocabulary.

CAVEDONA, l. ult. r. 80.

CAVEER, or CABEER, a money of account at Mocha, in Arabia, where accounts are kept in piastras of 80 caveers current.

CAVELLO, a copper coin of Naples.

CAVENDISH, *The Honourable* HENRY, in *Biography*, was the son of lord Charles Cavendish, and born in London in 1731. In literature, mathematics, chemistry, and philosophy, he was eminently distinguished; but his temper and habits were through life singularly recluse and economical; so that he appeared to those who were not honoured with being his intimate associates to great disadvantage. In early life his fortune was small; but by the retired manner in which he lived, and by subsequent accumulation of property, he died very rich. His library was very valuable; and easy of access to all his literary friends; but it is to be lamented that, in other respects, he was not emulous of following the example and acquiring the reputation of his eminent friend, sir Joseph Banks, the president of the Royal Society, whose Sunday evening meetings he constantly attended, being generally there as well as at the meetings of the Royal Society, where he was almost always present, more ready to hear than to speak. A similar reserve and taciturnity marked his character in all his ordinary social connections and secular concerns. As a philosopher, his ruling temper was not without its beneficial effects. His contributions to the Royal Society, and which may be found in its Transactions, relate to chemistry, electricity, meteorology, and astronomy. This eminent philosopher died on February 4th, 1810, in the 79th year of his age; and at that time was reckoned the greatest proprietor in the Bank of England, his wealth being estimated at nearly 1,300,000 pounds, which he left entirely among his relations.

CAVENDISH, in *Geography*, a town of Windfor county, in Vermont, having 1295 inhabitants.

CAUK, l. ult. add— and BARYTES.

CAULINIA, in *Botany*, so named by De Candolle, in honour of Don Philip Cavolini, an able Neapolitan naturalist, who has illustrated the principal species. —“De Cand. Fr. v. 3. 156.” Brown Prodr. Nov. Holl. v. 1. 339. (Poffidonia; König in Ann. of Bot. v. 2. 95. Kerner; Willd. Sp. Pl. v. 4. 947.)—Clafs and order, *Triandria Monogynia*. Nat. Ord. *Aroides*, Br.

Eff. Ch. Calyx and Corolla wanting. Filaments dilated, permanent, membranous, bearing the two-lobed anthers externally at the base. Germen superior, single-seeded. Stigma nearly sessile. Pericarp fleshy.

This genus is founded on *Zostera oceanica* of Linnæus, see Cavol. Monogr. translated in Ann. of Bot. v. 2. 77. t. 6. To this Mr. Brown adds a New Holland species, *C. serrulata*, with three doubtful ones, among which is *Ruppia antarctica*, Labill. Nov. Holl. v. 2. 116. t. 264. We are not informed why this genus supercedes the *CAVOLINIA* we have already described; see that article.

CAULOPHYLLUM, Michaux Bor.-Amer. v. 1. 204. Pursh 218. See LEONTICE.

CAUSTIC, LUNAR, l. 18, r. revived.

CAUSTIS, in Botany, *καυστις*, scorched hay or corn, alluding to the dry sheaths of the stem, which appear as if burnt.—Brown Prodr. Nov. Holl. v. 1. 239.—Clafs and order, *Triandria Monogynia*. Nat. Ord. *Calamaria*, Linn. *Cyperaceæ*, Juff. Br.

Eff. Ch. Spikelets nearly single-flowered. Scales fasciculated, the empty ones numerous. No bristles beneath the germen. Style dilated at the base. Stigmas three or four. Nut tumid, crowned with the bulbous base of the style.

Obf. One species has five *stamens*, a circumstance marked by Mr. Brown as very extraordinary.

These are rigid rushy plants, growing on dry heaths in New Holland. Their *stems* are leafless; round and undivided in the lower part; paniced and semi-cylindrical above; the ultimate branches awl-shaped and leaf-like. The *stems* are clothed with entire withered sheaths, extended on one side into an awl-shaped point, of the same colour. *Spikelets* paniced, small, sometimes dioecious. *Nut* ovate, white, opaque. *Brown*.

1. *C. flexuosa*.—Panicles loose, zigzag; their ultimate branches smooth. Scales of the spikelets smooth.—Found at Port Jackson.

2. *C. dioica*.—Panicles zigzag, rather dense; ultimate branches rough-edged. Scales of the spikelets downy.—Native of the fourth coast of New Holland.

3. *C. pentandra*.—Principal and partial branches stiff. Stamens five.—Found near Port Jackson.

CAWZI, or CAZI, denotes in India a Mahometan judge or justice, who also officiates as a public notary by affixing his seal. This is the same with the officer named Cadi in Turkey.

CAYUGA, in Geography, a county of New York, containing 29,843 inhabitants, of whom 75 are slaves.

CECIL, l. 3, add—in 1810, 13,066 inhabitants, of whom 2469 are slaves. Add at the close—containing 1167 inhabitants.

CEDAR CREEK, a hundred of Sulfex county, in Delaware, having 3874 inhabitants, of whom 310 are slaves.

CELEMINE, a corn measure in Spain. See CAFFISE.

CELESTINE Sulphate of Strontian. See STRONTIAN.

CELSIUS, ANDREW, in Biography, an eminent Swedish astronomer, was born at Upsal in 1701, and distinguished by his knowledge of mathematics, and more especially of astronomy, to which his attention was principally devoted. In 1730 he was appointed by the king professor of astronomy, and he contributed very much to the revival of the study of this science in his native country, where it had been much neglected. With this view, he travelled into foreign countries, visiting Germany in 1732, and Italy in 1733. From Bologna he went to Rome; and having an opportunity of measuring the power of light, he concluded from his experiments on this subject, that the light of the moon, at new moon, is eight times weaker than at full moon; and that the light of the sun is 320,000 times stronger than that of the moon; and when in the meridian, thirty times more powerful than in the horizon. From Rome he removed to Paris in 1734, and was there engaged to accompany Maupertuis and other eminent astronomers, who were appointed to measure a degree under the polar circle; a problem of great importance in determining the figure of the earth. To the success of this mission he very much contributed by his journey to London in 1736, in order to procure instruments of Graham's con-

struction, and here he had the satisfaction of being introduced to several scientific persons. On his return from this mission, he was recompensed for his services by a pension of 1000 livres, granted to him by the French government, as well as the quadrants which had been used at Tornea. In 1737 he returned to his own country, where he erected, in his own garden, a turret for the purpose of making observations; but in 1739, in consequence of a dissertation published at Upsal on the importance and utility of such observations, a large public observatory was immediately begun and completed in the following year. Thus furnished with the means of making his observations, he was indefatigable in the use of them, and in the correction of tables which had been before constructed. But on his observations of various kinds, and their practical result, our limits will not allow us to enlarge. His fame was daily increasing, so that he was a member of the Imperial Academy of the Searchers into Nature, of the Academy of Berlin, of the Royal Society of London, and of the Institute of Bologna. He was also secretary to the Society of Upsal, and to the Academy of Sciences at Stockholm. His separate works, as well as his communications to learned societies, were numerous; but his life and labours were terminated by a consumption, in the 43d year of his age, in April 1744. Gen. Biog. Appendix.

CEMENT. Mr. Parkes, in his "Essays," (vol. i. p. 320.) recommends the following fire-clay, as that which he employs, because he has not been able to discover a better; *viz.* good clay two parts, sharp washed sand eight parts, and horse-dung one part. These materials, being intimately mixed and beaten up with a little water, and the whole afterwards thoroughly tempered like mortar, by treading it for a considerable time with the feet. Mr. Watt's fire-clay, which is a good one, is formed by pounding porcelain clay from Cornwall, and mixing it to the consistence of thick paint, with a solution of borax, in the proportion of two ounces of borax to a pint of hot water.

CENARRHENSES, in Botany, from *κενως*, empty, and *αρσεν*, a male, so named by M. Labillardiere, who took the nectariferous glands for alternate abortive stamens.—Labill. Nov. Holl. v. 1. 36. Brown Prodr. Nov. Holl. v. 1. 371. Tr. of Linn. Soc. v. 10. 158.—Clafs and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceæ*, Juff. Br.

Eff. Ch. Petals four, regular, tapering, deciduous. Stamens inserted into the base of each petal. Nectariferous glands four, at the base of the germen, stalked. Germen sessile. Stigma simple. Drupa with a single nut.

1. *C. nitida*. Labill. t. 50.—Native of the southern part of Van Diemen's island. A smooth tree. *Leaves* alternate, stalked, obovate-oblong, shining, diltantly serrated, three or four inches in length. *Spikes* much shorter, axillary, solitary, simple. *Flowers* alternate, quite sessile, with a small, broad, acute bractea to each.

Mr. Brown has, in our opinion, most happily determined the natural order of this genus, which is nearly allied to *PERSONIA* (see that article); and his excellent remarks in the Linnæan Transactions, too long for insertion here.

CENIS, col. 2, l. 19, after plain, insert—about six miles long, covered with verdure; l. 46, add—From the highest of these mountains, Hannibal shewed his soldiers the fine country they were going to conquer. The highest point of Mount Cenis is 9261 feet at the grand cross, on the side of Italy 6022 feet.

CENOMYCE, in Botany, from *κενωσ*, empty, and *μυκη*, a sort of fungus, alluding to the hollowness of the little fungus-like receptacles.—Achar. Syn. 248. "Lichenogr.

105. t. 11. f. 3.—6."—Class and order, *Cryptogamia Alga.*
Nat. Ord. *Lichenes.*

Eff. Ch. Frond leafy, cartilaginous, lobed. Receptacles orbicular, coloured, inflated, without a border, on hollow tubular stalks.

This genus contains the *Lichenes pyxidati* of Linnæus, and embraces the *BROMYCES* of Perfoon, and of Acharius in his earlier works; but the latter name now designates another genus, which the reader will find in the present volume. Acharius has forty-two species of *Cenomyce*. Examples of the genus may be seen in *Engl. Bot. t. 907. 1393, 1894, 2051, &c.*

CENTER of Rotation, col. 6, l. 35, r. $p \times pC$; 1. 63, r. pC .

CENTER, in *Geography*, a township of Columbiana, in Ohio, having 1103 inhabitants.

CENTRANTHERA, in *Botany*, from *κεντρον*, a spur, and *ανθηρα*, an anther.—Brown Prodr. Nov. Holl. v. 1. 438.—Class and order, *Didymia Angiosperma.* Nat. Ord. *Personata*, Linn. *Scrophularina*, Br.

Eff. Ch. Calyx split at one side; its five segments cohering at the other. Corolla funnel-shaped; limb spreading, five-lobed, unequal. Stamens within the tube. Lobes of the anthers spurred at the base. Stigma lanceolate. Capsule with two cells, two valves, and a contrary partition bearing the receptacle of the seeds, at length separating from the valves.

1. *C. hispida*. Br. n. 1.—Found by sir Joseph Banks, in the tropical part of New Holland. An upright bristly herb, with opposite, undivided, narrow leaves, and a terminal spike. Flowers purplish, alternate, nearly upright, each with three bractæes. Capsule ovate, rather pointed, its valves sometimes divided. Seeds minute, with a lax reticulated skin. Albumen but small. Embryo round. Calyx at length separable into two divisions. Akin on the one hand to *Buchnera* and *Euphrasia*, on the other perhaps to *Digitalis*, being also allied to *Sesamum*, but distinguished by the structure of the capsule, and the presence of albumen. The stigma requires further examination. Mr. Brown thinks there is another species found in the East Indies.

CENTRE, in *Geography*, a county of Pennsylvania, containing 10,681 inhabitants.—Also, a township of Butler county, in Pennsylvania, containing 742 inhabitants.

CENTRE-HARBOR, a town of Strafford county, in New Hampshire, containing 349 inhabitants.

CENTROLEPIS, in *Botany*, Labill. Nov. Holl. v. 1. 7. See DEVAUXIA.

CEPHALOTUS, κεφαλον, *capitate*, expressive of the glandular head of each of the filaments.—Labill. Nov. Holl. v. 1. 6. Brown Bot. of Terra Austr. 68.—Class and order, *Dodecandria Hexagynia.* Nat. Ord. *Rosaceæ*, Juss. Br.

Eff. Ch. Calyx in six segments, coloured. Petals none. Stamens inserted into the rim of the calyx. Anthers glandular at the back. Germens single-seeded. Styles vertical.

1. *C. follicularis*. New Holland Pitcher-plant. Labill. as above, 7. t. 145. Br. t. 4.—In marshy ground, near King George's found and Prince's Royal harbour, on the south-west coast of New Holland, flowering in December and January. Herb perennial, with scarcely any stem. Leaves at the top of each division of the crown of the root, numerous, crowded, stalked, elliptic-lanceolate, acute, entire, smooth, or slightly hairy, an inch and a half long, intermixed with numerous, stalked, deflexed, inflated, pitcher-like vessels, larger than the leaves; double-winged, and fringed, at the front and sides; tumid and crenate at the margin; more or less closed by a convex ribbed lid. Each is half full of a sweetish watery fluid, in which ants are

generally found drowned, as in *NEPENTHES* (see that article); but these remarkable plants have no other character in common. *Flower-stalks* central, solitary, nearly round, hairy, leafless, twelve or eighteen inches high, each terminating in a dense, compound, obtuse cluster, of small white flowers. The fruit is unknown.

CEPHALUS, a genus of the cartilaginous order of fishes, the species of which have been united with those of the genera *Diodon* and *Tetrodon*; which see. Dr. Shaw has given the following character of this genus: jaws bony; body terminating abruptly, so as to resemble the head of a fish. The species enumerated by Shaw are, *C. brevis*, or *tetrodon mola* of Linnæus; *C. oblongus*, or *Cetodon truncatus*, or oblong *diodon* of Pennant; *C. varius*, with body variegated by whitish undulations and spots; *C. Pallasianus*, the *diodon mola* of Gmel. Linn.

CERASIN, in *Chemistry*, a name given by Dr. John to a peculiar vegetable substance, which has always been hitherto considered as a variety of gum. Its properties are the following.

It is a solid substance, having the general appearance and taste of gum; though it is usually harder than gum, and not so easily reduced to powder. When put into cold water it imbibes that liquid and swells up very considerably, and becomes semi-transparent and gelatinous, but is not in the least soluble, a property by which it is distinguished from gum. It dissolves in boiling water; but again precipitates as the liquid cools, and remains in the state of jelly. This gelatinous mass may be used like gum to paste together pieces of paper, &c. It is insoluble in alcohol and ether; but cold water, acidulated with either of the mineral acids, dissolves a small portion of it, and if heated, the whole. When an alkaline solution is dropped into the nitric solution of cerasin, a portion only of the cerasin is precipitated. If the liquid be evaporated, the remainder is obtained converted into a peculiar bitter-tasted substance.

Tragacanth gum may be considered as an example of pure cerasin. (See *TRAGACANTH*.) Cerasin also constitutes a portion of the gummy matter that exudes from the prunus *cerasus*, (hence the name,) prunus avium, prunus domestica, xanthera haitilis, &c.

CERATIOLA, in *Botany*, from *κερατιον*, a little horn, alluding to the appearance of the stigma.—Michaux Bor.-Am. v. 2. 221. Willd. Sp. Pl. v. 4. 712. Pursh 21.—Class and order, *Diocia Diandria.* Nat. Ord. *Ericis* affine? Juss.

Eff. Ch. Male, Calyx none. Corolla none.

Female, Calyx none. Corolla none. Stigma in many unequal segments. Berry with two seeds.

1. *C. ericoides*. Heath-like Ceratiola. Willd. n. 1. Pursh n. 1.—Native of Georgia and Florida, in dry gravelly soil; plentiful on the islands in the mouth of St. Mary's river. Pursh. A small shrub, determinately branched, resembling a heath; young branches finely woolly. Leaves four in a whorl, stalked, linear, revolute, rigid, smooth, about half an inch long. Flowers from small lateral buds, with concave, fringed scales. Anthers large, of two cells, bursting lengthwise. Segments of the stigma often combined into two little horn-like bodies. Berry globular, red, half the size of a pea. Perhaps this might be considered as an *EMPETRUM* destitute of calyx and corolla; see that article. It forms however a better artificial genus than many daily published. We have specimens from Mr. Frazer.

CERIUM, in *Chemistry*, the name of a metal. This metal, or rather its oxyd, is extracted from a Swedish mineral formerly confounded with tungsten, and was first obtained separately by Klaproth, who considered it as a new earth, to
which

which he gave the name of *ochroita*. (See OCHROITE.) About the same time this mineral was examined with more attention by Hisinger and Berzelius, who gave it the name of *cerit*, and detected in it a peculiar substance, which they considered as a metallic oxyd, to which they gave the name of *Cerium*, from the planet *Ceres*, then lately discovered by Piazzi. They did not succeed in reducing this oxyd; nor was Gahn, who made the experiment some time afterwards, more successful. Vauquelin, however, who had formerly examined the mineral, turned his attention to the subject a second time, and he succeeded in reducing it so far as to shew that its basis is a metal.

In 1814 a new set of experiments was made upon it by Laugier. He appears to have reduced it to the metallic state, but combined with carbon. Oxalic acid, according to Laugier, separates the whole of the oxyd of cerium from iron. The assertion of this chemist, however, that its oxyd is not volatile, has been denied by Dr. Thomson.

To procure the oxyd of cerium in a state of purity, the Swedish chemists employed the following method. The mineral was reduced to a fine powder, and digested in nitric acid till every thing soluble was taken up. The solution was then evaporated to dryness, and the residue dissolved in water. Into this solution ammonia was poured, till every thing precipitable by its means was thrown down. The precipitate being well washed, was redissolved in nitric acid, the acid neutralized, and then tartrate of potash added to the solution. The precipitate thus formed was then heated to redness, well washed with vinegar, and dried, and was considered as pure oxyd of cerium.

The oxyd of cerium, when first prepared, is white; but when it has been heated it becomes reddish-brown. Formed into a paste with oil, and heated in a charcoal crucible, it loses weight: when urged by a strong fire on charcoal, it does not melt but continues in powder. It exhibits, however, brilliant particles, which were proved to be of a metallic nature.

According to Vauquelin and Hisinger, cerium combines with two proportions of oxygen. The protoxyd is white; the peroxyd reddish-brown. The peroxyd contains $1\frac{1}{2}$ times as much oxygen as the protoxyd. The protoxyd, according to Hisinger, is composed of

Cerium	-	100
Oxygen	-	17.41
The peroxyd of Cerium	-	100
Oxygen	-	26.115

From Hisinger's experiments, it appears that the equivalent number for the protoxyd of cerium is 67.5, and of the metal 57.5. But if with Dr. Thomson we suppose the peroxyd to be a compound of two atoms of cerium and three of oxygen, the weight of the atom of peroxyd will be 145.

No compound of this metal with hydrogen, azote, chlorine, nor fluorine is known. The carburet formed by Laugier was a black matter, which took fire spontaneously when exposed to the air. The phosphuret, which appears to have been formed in one instance by Hisinger and Berzelius, was a hard, brown, tenacious substance, which shone in the dark, and took fire when heated.

Hydrofulphuret of ammonia throws down cerium at first of a brown colour, but it becomes deep green if the re-agent be added in larger quantity. When dry, the hydrofulphuret formed is a bright green, and burns when heated, leaving a yellow oxyd of cerium. The colour of the precipitate varies, however, according to the state of oxydation of the cerium held in solution.

No alloy of cerium is known, except one with iron, obtained by Vauquelin; this was white, brittle, and dissolved with great difficulty in nitro-muriatic acid.

Salts of Cerium. Nitrate of Cerium.—Nitric acid unites with both the oxyds of cerium; with the white oxyd it combines most readily. The solution is colourless, crystallizes with difficulty, retains an excess of acid, and has a sweet astringent taste. The red oxyd dissolves with difficulty in cold nitric acid, but the solution may be readily effected by heat. The solution is yellow, and if an excess of acid be present, it yields small white deliquescent crystals. Both the nitrates are soluble in alcohol, and are decomposed by heat.

Muriate of Cerium.—This salt exists in the form of small four-sided prismatic crystals of a yellowish-white colour. They are soluble in alcohol, and deliquesce on exposure to the air. When exposed to heat they are decomposed.

Sulphate of Cerium.—Sulphuric acid dissolves the red oxyd of cerium with difficulty. The solution when obtained is of an orange-colour, and yields by evaporation small octahedral and needle-formed crystals of persulphate of cerium. Their colour is partly lemon-colour and partly orange. This salt is not soluble in water without excess of acid. When exposed to the air, the crystals soon assume the form of a yellow powder. Sulphuric acid combines readily with the white oxyd of cerium, especially when in the state of carbonate. The solution is colourless, and readily crystallizes. There is a triple sulphate of potash and cerium.

Phosphate of Cerium.—This is a white powder insoluble in water, but soluble in the nitric and muriatic acids.

Arseniate of Cerium.—This salt is insoluble. There is a soluble superarseniate which does not crystallize.

Acetate of Cerium.—This salt exists in the form of small granulated crystals, readily soluble in water, but sparingly soluble in alcohol, and not altered by exposure to the air.

Oxalate of Cerium.—Oxalic acid and oxalate of ammonia precipitate cerium from its solution. The precipitate with the peroxyd is red, with the protoxyd white. It is not soluble in excess of acid, but readily in ammonia.

Tartrate of Cerium.—The tartrate of potash throws down cerium from its solutions in the form of a white insoluble tartrate. This tartrate, however, is soluble in nitric, muriatic, and sulphuric acids, and also in pure alkalies.

Citrate of Cerium.—The citrate of cerium is insoluble, without an excess of acid, when it is readily soluble. The solution does not crystallize. The other salts of this metal are unknown, or devoid of interest. With respect to these salts in general, it may be observed, that they are either of a white or yellow colour, according to the state of oxydation of the metal, and their solutions have a sweetish taste. The hydrofulphuret of potash, prussiate of potash, and oxalate of ammonia, produce in them white precipitates; while the gallic acid and infusion of galls occasion no precipitate, when added to solutions of their salts.

CERIUM. See MINERALOGY, *Addenda*.

CERNE, or CERNE-ABBAS, l. 36, add.—In 1811 the parish contained 145 houses, and 795 persons; viz. 358 males, and 427 females.

CERUMEN, or Ear-Wax, *Chemical Properties of.* This substance is nearly insoluble in water. Alcohol, when assisted by heat, dissolves five-eighths of the cerumen; the remainder is stated by Vauquelin to possess the properties of albumen mixed with a little oily matter: when the alcoholic solution is evaporated, it leaves a deep orange-residuum of a very bitter taste, having the smell and consistence of turpentine. It melts when heated, evaporates in a white smoke, without leaving any residuum, and in short resembles the resin of *lit.*

Ule. Ether also dissolves this oily body; but the solution is much less bitter, and lighter coloured. From these and other experiments, Vauquelin considers cerumen as composed of

Albumen,
An infusated oil,
A colouring matter,
Soda and phosphate of lime.

CESAR'S CREEK, a township of Greene county, in Ohio, having 640 inhabitants.

CETIC ACID, in *Chemistry*. A name given by Chevreul to a substance obtained by saponifying spermaceti. It may be procured by adding an acid to a soap composed of spermaceti and potash. Cetic acid is a white solid substance, without taste or smell. It melts at a temperature of about 113°, but does not crystallize on cooling, a circumstance in which it differs from spermaceti. It is insoluble in water, but boiling alcohol dissolves more than its weight of it, and as the solution cools, the cetic acid separates in brilliant lamellar crystals. The solution in alcohol reddens litmus. It combines readily with the different salifiable bases, and forms salts or rather soaps, none of which appear to possess any striking properties.

CETRARIA, in *Botany*, Achar. Syn. 226, a natural, but not very easily defined genus of *Lichenes*, comprising eleven species, among which are *L. juniperinus*, *glauca*, *nivalis*, and *islandicus* of Linnæus. See *LICHENES*, n. 19 in the arrangement of Acharius.

CEYLANITE, or **PLEENASTE**. See *MINERALOGY*, *Addenda*.

CHACE, col. 2, l. 32, for vizier *r. veneur*.

CHÆTANTHUS, in *Botany, from *χαίτη*, a bristle, and *άνθος*, a flower.—Brown Prodr. Nov. Holl. v. 1. 251.—Clafs and order, *Dioclea Triandria*. Nat. Ord. *Resiliaceæ*, Br.*

This genus is distinguished from *LEPTOCARPUS* (see that article) by the undivided *style*, and the minute setaceous form of the inner scales of the very short calyx. The only species is

1. *C. leptocarpoides*, found by Mr. Brown, on the fourth coast of New Holland.

CHÆTODON, col. 2, l. *ult.* for Japan *r. Java*. Add—See *TEUTHIS*.

CHÆTODON Arcuanus. Add—Perhaps from the Aroo islands among the Moluccas.

CHÆTOSPORA, in *Botany, from *χαίτη*, a bristle, and *σπορά*, a seed.—Brown Prodr. Nov. Holl. v. 1. 232.—This genus is founded by Mr. Brown, on those species of the *SCHOENUS* of Linnæus, and other authors (see that article), whose seed is subtended by bristles, which are not so long as the *scales* of the flower. Fifteen species are natives of various parts of New Holland, one of which, *C. lanata*, Br. n. 4, is *Schoenus lanatus*, Labill. Nov. Holl. v. 1. 19. t. 20. The rest appear to have been first described by Mr. Brown. *Schoenus compressus* and *rufus* of Fl. Brit. belong to *Chætospora*. See *RHYNCHOSPORA* for a genus similarly characterized.*

CHAIN, col. 2, l. 4 from bottom, *r. Plate XII*.

CHALK, FRENCH, *r.* See *SLATE*.

CHAMÆDORÆA, in *Botany, from *χαίμα*, dwarf, and *δωρῖα*, a gift, because the lower part of the stem yields the flowers and fruit.—Willd. Sp. Pl. v. 4. 800. Ait. Hort. Kew. v. 5. 394.—Clafs and order, *Dioclea Hexandria*. Nat. Ord. *Palmæ*.*

Eff. Ch. Male, Calyx deeply three-cleft. Corolla deeply three-cleft. Rudiment of a style longer than the stamens.

Female, Calyx deeply three-cleft. Petals three. Nectary

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three scales, between the petals and germen. Styles three. Drupa fuculent, with one seed.

1. *Ch. gracilis*. Slender Chamædorea. Willd. n. 1. Ait. n. 1. (Borallus pinnatifrons; Jacq. Hort. Schoenbr. v. 2. 65. t. 247, 248.)—Native of the Caracæas and of Guiana. An elegant palm, whose *trunk* is ten feet high, an inch in diameter, very smooth, crowned with alternate pinnate *leaves*, two feet long, and sending out from near the bottom several long, slender, aggregate *spikes*, of numerous small yellow *flowers*; the male ones longest, and pendulous. *Fruit* scarlet, the size of a pea.

CHAMÆRAPHIS, from *χαίμα*, dwarf, and *ραφή*, a needle, because each of the little short partial *stalks* bears a very long awn from near its apex.—Brown Prodr. Nov. Holl. v. 1. 193.—Clafs and order, *Triandria Trisynia*. Nat. Ord. *Gramina*.

Eff. Ch. Calyx of two valves, two-flowered; the outer valve very small. Corolla of two valves. Outer floret male, its outer valve like the inner valve of the calyx: inner female, smaller, membranous. Scales two beneath the germen. Stigmas feathery. Seed inclosed in the hardened corolla.

1. *Ch. bordeacæ*. Br. n. 1.—Gathered by Mr. Brown, in the tropical region of New Holland.—A perennial grass, with two-ranked, linear, straight *leaves*; their *stipula* rounded. *Spike* solitary, resembling *Hordeum*, with imbricated *flowers*, in two ranks, parallel to the zigzag *common-stalk*, on short *partial stalks*, each of which bears, from its inside, near the top, a very long *awn*. It is closely allied to *PANICUM* (see that article), differing chiefly in having three *styles*, which indeed is extremely peculiar.

CHAMBER, in *Architecture*, l. 5 from the end, *r.* ought not to be, &c.

CHANCEFORD. Add—It contains 996 inhabitants.

CHANCEFORD, *Lower*, a township of the same county and state, having 818 inhabitants.

CHARLEMONT, a township of America, l. 3, *r.* 987.

CHARLES COUNTY, l. 4 and 5, *r.* 20, 245, including 12,435 slaves.

CHARLES City, l. 4, *r.* 5186, and 3023.

CHARLES, Sr. Add—Also, a parish of the German coast county, in the territory of Orleans, containing 3291 inhabitants, of whom 2321 are slaves.—Also, a district in Louisiana, containing 3505 inhabitants, including 271 slaves.

CHARLESTON (2d article), l. 5, *r.* 38,468, and 33,714.

CHARLESTON (3d article), insert in l. 1.—city; l. *ult.* *r.* 1810, 24,711, and 11,671.

CHARLESTOWN, l. 3.—The population is 5283; the senatorial electors 660, by the census of 1810. Here are two Presbyterian or Dutch reformed churches, one for Baptists, one for Methodists, and 30 school-houses; l. 7.—The number of inhabitants in 1810 was 28, including one slave; l. 8.—The number of inhabitants is 1580; l. 14.—The population in 1810 was 1501; l. 27, for 2000 *r.* 4959; l. 41, for 2022 *r.* 1174, including one slave.—Also, a township of Indiana, in Clark county, having 11 inhabitants.

CHARLETON, col. 2, l. 8, by the census of 1810, the number of inhabitants was 1946, and of senatorial electors 227; l. 12, for 1965 *r.* 2180.

CHARLOTTE, l. 5, for 635 *r.* 1679.

CHARLOTTE, a county of Virginia, l. 3, for 10,078 *r.* 13,161, and for 4916 *r.* 7597.

CHARLTON. Add—Also, a town of Worcester county, in Massachusetts, having 2180 inhabitants.

CHARTIER. Add—It contains 1747 inhabitants.

CHARTRES, l. 11, r. 48° 26' 54". E. long. 1° 29' 35".
CHASE, in *Sea-Language*, col. 2, l. 5, r. keeps the chafe.

CHASSIS DE GALERIE, r. CHASSES, &c.

CHATHAM, col. 3, l. 19 from bottom, r. 2191 and 12,652.

CHATHAM, in America, l. 5, r. 1334; l. 8, r. 208; l. 12, after 1767, add—It contains 3258 inhabitants; l. 14, after Newark, add—Also, a town of Morris county, in New Jersey, having 2019 inhabitants.—Col. 2, l. 2, r. 12,877; l. 3, r. 3635; l. 12, after contains, add 7553; l. 13, r. 48.

CHAUX de Fond, l. 4, r. Locle; l. 6, r. Locle.

CHEESE, *Chemical Properties of*. See MILK.

CHEESE—*Presfs*, col. 2, l. 22, insert—*Agriculture, Plate, &c.*
CHEILANTHES, in *Botany*, a genus of ferns, first distinguished from ADIANTUM, (see that article in the present volume,) by professor Swartz, and named from *χειλος*, margin, and *ανθος*, a flower, because the fructification is really inserted into the margin of the frond, not into the scales which conceal it. Such indeed was the idea hitherto conceived of *Adiantum*; but this not being the case with the original and best-known species, *Capillus Veneris*, the generic appellation was properly allowed to remain with that and its allies, under a corrected character.—Swartz Syn. Fil. 126. t. 3. Willd. Sp. Pl. v. 5. 455. Brown Prodr. Nov. Holl. v. 1. 155. Ait. Hort. Kew. v. 5. 526. Sm. Prodr. Fl. Græc. Sibth. v. 2. 278. Pursh 670.—Clafs and order, *Cryptogamia Filices*. Nat. Ord. *Filices annulate*.

Efil. Ch. Capfulæ annulate, in distinct marginal dots. Involucrum of membranous, distinct, inflexed scales, separating internally.

Dr. Swartz defines sixteen species; professor Willdenow nineteen, the latter disposing the whole in three sections, though marked as two only, according to an inaccuracy we have often noticed in him. The following are sufficient examples.

SECT. 1. *Frond simply pinnate*. One species.

Ch. *micropteris*. Small Cheilanthes. Willd. n. 1. Sw. n. 1. 324. t. 3. f. 5.—Frond pinnate, linear; leaflets hairy, nearly orbicular, with wave-like notches.—Native of Quito. *Fronds* narrow, a finger's length, with several, alternate, slightly stalked leaflets, about a line in diameter.

SECT. 2. *Frond doubly pinnate*. Ten species.

Ch. *pteroides*. Pteris-like Cheilanthes. Willd. n. 2. Sw. n. 12. Ait. n. 1. (*Adiantum pteroides*; Linn. Mant. 130. Pteris orbiculata; "Houtt. Nat. Hist. t. 96. f. 3.")—Frond doubly pinnate; lower branches somewhat compound; leaflets ovate-elliptical, obtuse, rather heart-shaped, finely crenate. Dots crowded. Coverings imbricated. Common stalk polished.—Native of the Cape of Good Hope. A handsome fern, a foot or more in height, with stout, black, shining stalks, and firm dark-green leaflets, half an inch long; paler beneath. This and the following might have been referred to the next section.

Ch. *suaveolens*. Aromatic Cheilanthes. Willd. n. 5. Sw. n. 6. "Schkuhr Crypt. 116. t. 19." Sm. Fl. Græc. Sibth. t. 966, unpublished. (*Polypodium fragrans*; Linn. Mant. 307. Desfont. Atlant. v. 2. 408. t. 257. Petiv. Gazoph. t. 73. f. 4.)—Frond doubly pinnate, smooth; lower branches more or less compound; leaflets ovate, obtuse, somewhat revolute. Common-stalk thread-shaped, roughish with slender scales.—Found on rocks and old walls in Barbary, Madeira, Cyprus, &c. An elegant little fern, three or four inches high, very fragrant when first dried. The copious hair-like tawny scales of the stalk are sometimes almost entirely wanting.

Ch. *fragrans*. Sweet-scented Cheilanthes. Willd. n. 7. Sw. n. 4. 325. t. 3. f. 6. Ait. n. 2?—Frond doubly pinnate, smooth; leaflets elliptic-lanceolate, obtuse, pinnatifid, with incurved, partly cloven segments. Common-stalk somewhat hairy.—Native of the East Indies, from whence Kœnig sent specimens, which remain unnamed in the Linnean herbarium. The Madeira plant, gathered by the same botanist, is, as Dr. Swartz suspected, a different species, being the *Polypodium fragrans* of Linnæus, our *Ch. suaveolens*, which is probably also Mr. Aiton's *Ch. fragrans*. The East Indian fern before us is excellently delineated by professor Swartz, and has a more oblong frond, with curiously pinnatifid leaflets, nor can those who have seen both species ever confound them. We are unacquainted with *Ch. odora*, Willd. n. 6.

SECT. 3. *Frond triply or quadruply pinnate*. Eight species.
Ch. *dichotoma*. Forked Cheilanthes. Willd. n. 15. Sw. n. 15. 335. t. 3. f. 7.—Frond three or four times pinnate, smooth; leaflets three-lobed, obtuse, somewhat crenate.—Native of mountains in Quito. A span high, slender and delicate, with alternate, wavy, almost capillary branches, and minute round-lobed leaflets.

Ch. *tenuifolia*. Fine-leaved Cheilanthes. Willd. n. 16. Sw. n. 13. 332. "Schkuhr Crypt. t. 125." Br. n. 1. (*Trichomanes tenuifolia*; Burm. Ind. 237. *Dryopteris campestris*; Rumph. Amboin. v. 6. 74. t. 34. f. 2.)—Frond triply pinnate, smooth; leaflets obovate-oblong, slightly crenate; upper ones confluent.—Native of the East Indies. This has the habit of *fragrans* and its allies, but is much larger.

Ch. *dealbata*. White-leaved Cheilanthes. Pursh n. 2.—"Frond triply pinnate; leaflets oval, distinct, crenate or emarginate at the end; white beneath."—On rocks, on the banks of the Missouri, in July. A very delicate small fern, much resembling *Ch. tenuifolia*. Pursh.

CHEKIE, or CHEQUEE, a Turkish weight: that with which gold, silver, diamonds, and precious stones are weighed, is divided into 100 drachms, and the drachm into 16 kilitots or carats, or 64 grains. A chequee weighs 10 oz. 5 dwts. 3 grs. troy weight; and a drachm 49½ grs. ditto; so that 48 chequees = 41 lbs. troy nearly. The oke is = 4 chequees, or 400 drachms; and the chequee = 11 oz. avoirdupois. The chequee of goats' wool is 800 Turkish drachms, or 5 lbs. 10 oz. avoirdupois; the chequee of opium 250 Turkish drachms = 27 oz. 10 drs. avoirdupois.

CHELSFORD, col. 2, l. 12 from the bottom, r. 4649 and 822.

CHELSFORD, in America, l. 4, r. 1396.

CHELSEA, in America, l. 3, r. 594; l. 8, r. 1327.

CHELTHENHAM, col. 2, l. 19 from the bottom, r. 8325; l. 12, r. 1568.

CHELTHENHAM, a township of Montgomery county, in Pennsylvania, having 783 inhabitants.

CHEMIN CREUX, r. RAVINE.

CHENANGO, a county of New York, containing, by the census of 1810, 21,704 inhabitants, of whom 13 arc slaves.

CHEPSTOW, col. 4, l. 48, for wall r. walk. Add—The parish of Chepflow contained, in 1811, 421 houses, and 2581 persons; 1158 being males, and 1423 females.

CHERAY, or CHURAY, a weight in Persia; the batman of Churay being double the batman of Taurus, and weighing 12 lbs. 4 oz. 13 drs. avoirdupois.

CHERBOURG, l. ult. r. N. lat. 49° 38' 31". W. long. 1° 37' 18".

CERRYFIELD, in *Geography*, a town of Walsingham county, in the district of Maine, with 181 inhabitants.

CERRY-

CHERRY-TREE, a township of Venango county, in Pennsylvania, having 391 inhabitants.

CHESHAM. The parish of Chesham, in 1811, contained 417 houses, and 2071 persons; 924 being males, and 1147 females.

CHESHIRE, col. 2, l. 4 from the bottom, r. 41, 187 and 227, 031.

CHESHIRE. By the returns of 1811, Ashton-upon-Mersey in this county, and in a parish of the same name (omitted in its alphabetical arrangement), appears to have then contained 156 houses, and 918 persons; 467 being males, and 451 females.

CHESHIRE, in America, *dele* l. 5 and 6, and add—and 40,988 inhabitants.

CHESHIRE, a township, &c. l. 3, add—containing 1315 inhabitants. At the close, add—It contains 2288 inhabitants.

CHESNUT HILL. Add—containing 1128 inhabitants.

CHEST, in *Anatomy*, l. 2, insert—LUNGS.

CHEST OF VIOLS, *dele* SIX-STRINGED BASE.

CHESTER, col. 6, l. 17. In 1811, the city of Chester contained 3296 houses, and 16,140 persons; 7007 being males, and 9133 females; 397 families employed in agriculture, and 2296 in trade and manufactures.

CHESTER, in Nova Scotia, l. 8, r. 1534; l. 13, r. 2030; l. 17, r. 2370; l. 30, after affixants, add—It contains 1056 persons; l. 32, r. 40; l. 33, r. 39,596; l. 34, r. 7; l. 57, r. 11,479; l. 58, r. 2743. At the close, add—Also, a town of Clinton county, in Ohio, having 1254 persons.—Also, a town of Burlington, in New Jersey, having 1839 inhabitants.—Also, a town of Morris county, in New Jersey, having 1175 inhabitants.—Also, a borough of Chester county, in Pennsylvania, having 471 inhabitants.

CHESTER, *Wesf*, a county of New York, containing 30,272 inhabitants, of whom 982 are slaves.

CHESTERFIELD, col. 2, l. *ult*. In 1811 the parish of Chesterfield contained 951 houses, and 4476 persons; 2025 being males, and 2451 females.

CHESTERFIELD, l. 3, r. 1408; l. 7, r. 1839; l. 15.—It contains 5564 inhabitants, of whom 1639 are slaves; l. 17, r. 9079, and 6015. Add—Also, a town of Burlington county, in New Jersey, having 1839 inhabitants.

CHESTER-LE-STREET. In 1811, the township of Chester-le-Street contained 245 houses, and 1726 persons; 800 being males, and 926 females.

CHESTERVILLE, a town of the district of Maine, in the county of Kennebeck, with 430 inhabitants.

CHETWERT, and **CHETWERICK**, two corn measures in Russia; the former or cool being 2 *omins* = 4 pajacks = 8 chetwericks = 64 garnitzis. The latter measures 1555.92 cubic inches, and contains 5 $\frac{2}{3}$ Winchester gallons nearly. In business the usual calculation is, that 100 chetwers produce 72 quarters, and 1 chetwert 5 $\frac{2}{3}$ bushels, Winchester measure.

CHIASTOLITE. See MINERALOGY, *Addenda*.

CHICHESTER, in *Geography*. In 1811, the city of Chichester contained 1083 houses, and 6425 persons; 2878 being males, and 3547 females.

CHICHESTER, *Upper and Lower*. Add—The former contains 437, and the latter 511 inhabitants.

CHICHESTER, l. 4, r. 951.

CHILISQUAQUE. Add—Northumberland county, having 1505 inhabitants.

CHILLIKOTHE. Add—By the census of 1810, it contained 1360 inhabitants.

CHILMARK, l. 3, r. 723.

CHILODIA, in *Botany*, perhaps from *χιλος*, in allusion to its longer and more conspicuous lip.—Brown Prodr.

Nov. Holl. v. 1. 507.—Clafs and order, *Didymia Gymnospermia*. Nat. Ord. *Verticillate*, Linn. *Labiate*, Juff. Br.

Eff. Ch. Calyx two-lipped, with a pair of appendages; tube striated; upper lip undivided, with an interior transverse rib; lower divided half way. Corolla ringent; upper lip shorted, undivided; lower with a large cloven central lobe. Anthers pointless, deeply cloven at the base.

1. Ch. *scutellariana*. Br. n. 1.—Gathered by Mr. Brown at Port Jackson, New South Wales. A little shrub, agreeing with *Proflanthera* in habit, but differing in *calyx* and *anthers*. The leaves are linear, revolute. Flowers axillary, solitary, stalked. We venture to rid the specific name of its termination, *oides*, which might be done with advantage in many other similar instances.

CHILOGLOTTIS, from *χιλος*, a lip, and *γλωττις*, the tongue, alluding to the tongue-shaped appendage to the lip.—Brown Prodr. Nov. Holl. v. 1. 322.—Clafs and order, *Gynandria Monandria*. Nat. Ord. *Orchideae*.

Eff. Ch. Calyx ringent; two lower leaves under the lip, channelled, with cylindrical points. Lip stalked; glandular in the disk; with a tongue-shaped appendage at the base. Column cloven at the top. Anther a terminal permanent lid; the cells close together. Masses of pollen two in each cell, powdery, compressed.

1. Ch. *diphylla*.—Native of Port Jackson, New South Wales. *Bulbs* solitary, naked, terminating the descending caudex. *Herb* smooth. *Leaves* two, oval, many-ribbed, sheathed at the base. *Flower* solitary, reddish, with a solitary bractea half way up the stalk. Akin to *CYRTOSTYLIS* and *PTEROSTYLIS*. *Brown*. See those articles.

CHIMBORAZO, l. 9, add—according to Humboldt, its summit is 21,430 feet above the level of the sea; and consequently a great part is above the circle of perpetual congelation, which, in this latitude amount under the line, is situated higher than the summit of Mont Blanc.

CHINA, col. 3, l. 19 from the bottom, r. Mandshurs. Col. 24, l. 4, r. sticks or poles.

CHIODECTON, in *Botany*, from *χιλος*, *σωον*, and *δεχομαι*, to receive, alluding to the whiteness of the warts or aggregate receptacles.—Achar. in Tr. of Linn. Soc. v. 12. 43. t. 3.—A genus of crustaceous Lichens, found on the barks of trees in South America, thus defined.

Eff. Ch. Warts convex, of the substance of the crust. Receptacles numerous, imbedded in the warts, globular, aggregate, black, powdery throughout.

Two species are described, *Ch. sphaerale*, f. 2, and *seriale*, f. 3.

CHIPPENHAM, l. 30.—In 1811, the borough and parish contained 668 houses, and 3410 persons; viz. 1580 being males, and 1830 females; 145 families employed in agriculture, and 652 in trade and manufactures.

CHITTENDEN, l. 6, r. 1810; l. 24, r. 1820. At the close, add—It contains 446 inhabitants.

CHLOANTHES, in *Botany*, *χλωανθεις*, turning green; from the colour assumed by the pale yellow corolla in drying, as is the case with the primrose.—Brown Prodr. Nov. Holl. v. 1. 513.—Clafs and order, *Didymia Angiospermia*. Nat. Ord. *Perfonate*, Linn. *Viticeae*, Juff. Gen. *Verbenaceae*, Juff. Br.

Eff. Ch. Calyx bell-shaped, equally five-cleft. Corolla tubular, ringent; throat dilated; upper lip cloven; lower in three deep segments, the middle one longest. Stamens prominent. Stigma cloven, acute. Drupa dry. Nuts two, each of three cells; two lateral cells single-seeded; middle one abortive, obliterated.

Downy *shrubs*, with opposite, simple, decurrent, linear, bilobed leaves. Stalks axillary, solitary, single-flowered,

each with two *bractæas*. Calyx rather leafy, revolute at the edges. Corolla sulphur-coloured; turned green by drying. Nuts tumid in front. Seeds with scarcely any albumen. Brown.

1. *Ch. floecchadis*. Br. n. 1.—Back of the leaves, and outside of the calyx, snow-white, downy. Bractæas in the middle of the flower-stalks.—Native of Port Jackson, New South Wales.

2. *Ch. glandulosa*. Br. n. 2.—Back of the leaves glandular, and clothed, like the outside of the calyx, with scattered hairs. Bractæas at the base of the flower-stalks.—From the same country.

CHLORATES, in *Chemistry*. See CHLORINE.

CHLORIC Acid. See CHLORINE.

CHLORINE. This name was given by Sir H. Davy to the principle formerly termed OXYMURIATIC Acid, under which head its leading properties are detailed. We have only therefore to notice here some important compounds of this principle lately discovered, especially those with oxygen.

The protoxyd of chlorine, or *euchlorine*, has been already described under the article above alluded to. For its correct composition, see Table II. ATOMIC Theory.

The deutoxyd of chlorine was discovered about the same time by Sir H. Davy and the count Von Stadion of Vienna, but Davy's account of it was first published. It may be prepared by mixing together a small quantity of chlorate of potash (not more than fifty grains) in powder, with sulphuric acid, till the whole forms a dry paste of an orange colour. Put this paste into a small glass retort, and plunge the belly of the retort into hot water, and keep it in that position for some time, taking care that the temperature of the water never becomes so high as 212°. A bright yellowish-green gas separates from the paste, which must be received in small glass jars over mercury. This gas is the deutoxyd of chlorine. Its colour, as above stated, is a bright yellowish-green. Its smell is peculiar and aromatic, without any mixture of the smell of chlorine. Water absorbs at least seven times its bulk of this gas. The solution is deep yellow, and has an astringent and corrosive taste, leaving a disagreeable and lasting impression on the tongue. It destroys without previously reddening vegetable colours, provided they are moist. It does not act upon mercury, nor any other combustible substance tried, except phosphorus, which, when introduced into the gas, occasions an explosion, and burns with great splendour. When heated to 212° it explodes with more violence than *euchlorine*, and emits a great light. Two volumes of deutoxyd of chlorine, when thus exploded, are converted into three volumes, according to Davy, which consist of two volumes or four atoms of oxygen and one of chlorine, or *per centum* of

Chlorine	-	-	-	52.94
Oxygen	-	-	-	47.06
				100.00

And its sp. gr. will be 2.361, that of chlorine being supposed to be 2.5. According, however, to the count Von Stadion's analysis, this deutoxyd is composed of one atom chlorine, and only three of oxygen.

Chloric Acid.—The existence of this compound of chlorine with oxygen was suspected by Berthollet, but it was first obtained by M. Gay-Lussac. It is the acid which exists in what was formerly termed *oxymuriate*, but now *chlorate* of potash. It was procured by dissolving the chlorate of barytes in water, and cautiously adding dilute sulphuric

acid to the solution, till the whole of the barytes was separated. The *chloric acid* remained in solution. This acid has a strong sour taste, but no fenible smell. Its aqueous solution is colourless, and reddens vegetable blues without destroying them. By a gentle heat it may be concentrated without being decomposed, or volatilized with the water. When thus concentrated, it has an oily consistency. When the heat is raised, it is partly volatilized, and partly decomposed into chlorine and oxygen. Muriatic acid decomposes it similarly without heat: the nitric acid does not affect it. It combines with the different bases forming *chlorates*, formerly termed *oxymuriates*, the most important of which will be presently described. Chloric acid has been proved to be composed of

Chlorine	-	-	-	47.24
Oxygen	-	-	-	52.76
				100.00

Of one atom chlorine and five of oxygen. See ATOMIC Theory, Table II.

Chlorate of Potash.—This is the best known and most important of the chlorates. See it briefly described under HYPEROXYMURIATIC Acid.

Chlorate of Soda.—This salt was first accurately described by Chenevix. It may be prepared by the same process as the chlorate of potash; but the easiest mode of obtaining it is, to dissolve carbonate of soda in chloric acid. It does not readily crystallize, but its crystals when formed are square plates. Its taste is sharp and cooling. On burning coals it melts into globules, and emits a yellow light. When distilled it gives out oxygen, mixed with a little chlorine, and the salt left behind has alkaline properties.

Chlorate of Ammonia.—This salt may be formed by dissolving carbonate of ammonia in chloric acid, or by mixing a solution of carbonate of ammonia with a solution of an earthy chlorate. It crystallizes in fine needles, and is very soluble in water and alcohol. Its taste is sharp. Thrown on burning coals, it fulminates with a red flame. When strongly heated, it is decomposed, chlorine is evolved mixed with azote and oxygen, and some muriate of ammonia remains behind.

Chlorate of Barytes.—The earthy chlorates are formed with more difficulty than the alkaline. The chlorate of barytes may be formed by pouring warm water on a quantity of the pure earth prepared by Vauquelin's method, and passing a current of chlorine through the mixture. To separate the chlorate from the muriate, which are both equally soluble, and otherwise resemble each other, Mr. Chenevix had recourse to the ingenious expedient of boiling phosphate of silver with the compound solution; thus muriate of silver and phosphate of barytes are formed and easily separated, while nothing but the chlorate of barytes remains in the solution, and may be easily obtained. This salt crystallizes in square prisms, terminated by an oblique face. It dissolves in about four times its weight of cold water. The solution is neither precipitated by nitrate of silver nor muriatic acid. It is insoluble in alcohol. When heated it gives out oxygen gas, and an alkaline residuum is left.

Chlorate of Strontian.—This salt was formed by a process similar to the above, and resembles it in many of its properties, but is deliquescent, and rather more soluble.

Chlorate of Lime, and *Chlorate of Magnesia*, may be formed as above. They are both deliquescent, and very soluble both in water and alcohol.

The metallic *Chlorates* may be formed by dissolving the oxyds

oxyds of the different metals in chloric acid. They do not possess any very remarkable properties, except those common to all the chlorates; viz. of giving out oxygen when heated, and of detonating when thrown on burning coals. The chlorate of silver, mixed with a little sulphur, and struck slightly, fulminates with prodigious violence.

CHLORIODIC ACID. See IODINE and SIMPLE Substances.

CHLORITE. See MINERALOGY, *Addenda*.

CHLORO-CYANIC ACID. See CYANOGEN.

CHLOROPHANE. See MINERALOGY, *Addenda*.

CHLOROPHYTUM, in *Botany*, from *χλωρον*, green, and *φύλον*, a plant, because of the green hue of the flowers, as well as herbage, in the original species.—Ker in Curt. Mag. 1071. Brown Prodr. Nov. Holl. v. 1. 276.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. "*Bromeliæ*, Juff." Ker. *Aphodeæ*, Brown.

Eff. Ch. Corolla inferior, in fix deep, equal, spreading, permanent segments. Filaments thread-shaped, smooth. Style thread-shaped. Stigma fimple. Capsule with three deep compressed lobes, three cells, and three valves with central partitions. Seeds several, compressed, with a naked scar.

Herbage smooth. *Root* fasciculated; the fibres occasionally fleshy. *Leaves* radical, ribbed, linear, sometimes lanceolate. *Flowers* racemose green or white, their partial stalks jointed in the middle. *Capsule* membranous, veiny.

1. *Ch. inornatum.* Greenish-flowered Chlorophytum. Curt. Mag. t. 1071. Ait. Epit. 365.—Stem none. Leaves lanceolate, nearly as tall as the stalk. Partial stalks solitary.—Native of Sierra Leone, from whence, and not from the West Indies, its seeds were brought to the late Mr. Fairbairn, at Chelsea, if we mistake not, by Francis Borone, in 1793. It is a stove plant, flowering and seeding in summer. Several radical, many-ribbed, pointed leaves, five or six inches long, paler beneath, are accompanied by an erect, simple or branched, leafless stalk, a span high. Flowers pale green, scentless, each with a pointed bractea. Corolla spreading, three-quarters of an inch wide.

2. *Ch. laxum.* Loose-clustered White Chlorophytum. Br. n. 2.—"Stem none. Leaves linear, nearly as tall as the stalk. Clusters lax, elongated, simple or divided; partial stalks solitary or in pairs."—Found by Mr. Brown, in the tropical part of New Holland.

3. *Ch. clatum.* Tall Chlorophytum. (Anthericum elatum; Ait. Hort. Kew. v. 2. 268. Willd. Sp. Pl. v. 2. 138. Aphodelus foliis planis, &c.; Mill. Ic. 38. t. 56. Phalangium elatum; Redout. Liliac. t. 191.)—Stem much branched, almost leafless, much taller than the linear-lanceolate radical leaves.—Native of the Cape of Good Hope. A perennial green-house plant, flowering in August and September. The flowers are copious, white, smaller than in the first species, solitary and almost sessile.

Mr. Brown mentions a fourth species, found at the Cape, but without any name or character.

CHONDRACHNE, Brown Prodr. Nov. Holl. v. 1. 220, a genus consisting of only one species, distinguished by its inflorescence alone from CHORIZANDRA; see that article.

CHORD, col. 2. l. 13, for EO r. ED.

CHORETRUM, in *Botany*, Brown Prodr. Nov. Holl. v. 1. 354.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Santalacææ*, Br.

Eff. Ch. Calyx superior, in five deep, vaulted, coloured segments, each with an interior descending keel, permanent, with a minute five-toothed calycle at the base. Stamens in the hollows of the segments. Anthers with four cells and four valves. Stigma radiated. Drupa?

The only known species are *Ch. lateriflorum* and *glomeratum*, found on the fourth coast of New Holland, rusty branched shrubs, with minute scattered leaves, and small white flowers, being nearly related to LEPTOMERIA; see that article.

CHORISPERMUM, from *χωρις*, separately, and *σπέρμα*, seed, see the character.—Brown in Ait. Hort. Kew. v. 4. 129.—Clafs and order, *Tetrandrymia Siliquosa*. Nat. Ord. *Siliquosæ*, Linn. *Cruciferae*, Juff.

Eff. Ch. Pod of two cells, without valves, separating into single-seeded clofed fragments. Cotyledons flat, acuminate. Stigma fimple.

1. *Ch. tenellum.* Purple Chorispermum. Ait. n. 1. (Raphanus tenellus; Willd. Sp. Pl. v. 3. 561. Pallas Voy. v. 3. 741. t. L. f. 3.)—Leaves, as well as pods, smooth; upper ones lanceolate, toothed; lowermost pinnatifid.—Native of defarts near the Caspian sea. A little annual herb, with small purple flowers. Mr. Brown's specific character indicates the existence of another species, not known to us.

CHORIZANDRA, from *χωρίζω*, to separate, and *ανδρς*, a male, because the stamens are individually separated by scales.—Brown Prodr. Nov. Holl. v. 1. 220.—A genus consisting of two species, natives of Port Jackson, nearly akin to CHONDRODRACHNE of the same author, and to the LINNÆAN CHRYSITRIX; see those articles. From the latter it differs in inflorescence and habit. How far they could with propriety be united, we have not materials to form a decisive opinion.

CHORIZEMA, a name of which there have been various explanations, (see Tr. of Linn. Soc. v. 9. 252,) is most probably derived from *χωρίζω*, to separate; but certainly not in allusion, as De Theis supposes, to any division of the fruit. We rather believe the author of this name had in contemplation the separate filaments, of which so few instances were known in papilionaceous flowers, at the time he wrote, and *ήμας* may allude to their *dart-like* figure.—Labill. Voy. Engl. ed. v. 1. 435. Nov. Holl. v. 2. 120. Sm. in Sims and Kon. Ann. of Bot. v. 1. 566. Tr. of Linn. Soc. v. 9. 251. Ait. Hort. Kew. v. 3. 8. (Podolobium; *ibid.* 9.)—Clafs and order, *Decandria Monogynia*. Nat. Ord. *Papilionacææ*, Linn. *Leguminosææ*, Juff.

Eff. Ch. Calyx five-cleft, two-lipped. Corolla papilionaceous. Style curved. Stigma obtuse. Legume oblong, tumid, of one cell, with many seeds.

1. *Ch. ilicifolia.* Holly-leaved Chorizema. Labill. as above, t. 21. Sm. n. 1. Ait. n. 1.—Leaves alternate, oblong, pinnatifid, with spinous teeth; point entire, longer than the teeth. Bractæes close to the flower.—Found by M. Labillardiere, at the foot of the mountains, on the fourth coast of New Holland, flowering in December. Sent to Kew in 1803, by Mr. Good. Stem shrubby, hardly a foot high, branching from the root. Leaves alternate, sessile, smooth, coriaceous, with sharp spines. Flowers in terminal clusters.

2. *Ch. nana.* Dwarf Chorizema. Sims in Curt. Mag. t. 1032. Ait. n. 2. (Pultenea nana; Andr. Repof. t. 434.)—Leaves alternate, elliptic-oblong, bluntish, sinuated, with spinous teeth. Bractæes rather distant from the flower.—From the same country. We profit by Mr. Brown's remarks for distinguishing this species, hitherto confounded by us with the foregoing. Its stature is more humble. Flowers in lateral clusters, orange, with purple wings, and a short, white, purple-tipped keel. We know not distinctly the colour of *ilicifolia*.

3. *Ch. rhombica.* Few-flowered Chorizema. Br. in Ait. n. 3.—"Leaves entire, flat, pointed; lower ones orbicular, somewhat

somewhat rhomboid; upper elliptic-lanceolate. Stalks with few flowers.—Native of the same country. *Mr. Brown.*

4. *Ch. triloba.* Three-lobed Chorizema. Sm. n. 2. (*Podolobium trilobum*; Ait. Hort. Kew. v. 3. 9. Curt. Mag. t. 1477. *Pultenaea ilicifolia*; Andr. Repof. t. 320.)—Leaves opposite, somewhat hastate; entire or toothed, spinous. Clusters axillary, shorter than the leaf. Germen silky.—Found near Port Jackson, New South Wales. (See *PODOLOBIUM.*) Young *branches* and *leaves* downy. *Flowers* copious, yellow, with a red radiating spot, and red *keel*, the latter nearly as long as the *stings*.

5. *Ch. scandens.* Climbing Chorizema. Sm. n. 3.—Leaves nearly opposite, elliptical, undivided. Clusters terminal, elongated. Calyx rather hairy.—Found by Dr. White, at Port Jackson. *Stem* twining. *Flowers* in loose pendulous clusters, yellow variegated with red.

6. *Ch. sericea.* Silky-leaved Chorizema. Sm. n. 4.—Leaves mostly alternate, elliptical. Clusters axillary, the length of the leaves. Calyx silky. Standard narrow.—Gathered by Mr. Menzies, at King George's found. *Stem* twining. *Leaves* more silky at the back than in *C. scandens*; *flowers* thrice as large as in that species.

7. *Ch. coriacea.* Leathery-leaved Chorizema. Sm. n. 5.—Leaves roundish-elliptical, abrupt, coriaceous, scattered. Umbels axillary, stalked. Calyx hairy.—From the same country. A stout, upright, rigid *shrub*. *Leaves* beautifully veiny; silky beneath. *Umbels* on silky stalks, much shorter than the leaves.

CHOUT, denotes in India a fourth part; and the Mahratta chout is a fourth of the revenues, exacted as tribute by the Mahrattas.

CHOWAN, l. 3, r. 5297 and 2789.

CHRISTCHURCH. In 1811 the borough and freet contained 303 houses, and 1553 persons; 682 being males, and 871 females.

CHRISTIAN, a county of Kentucky, containing 10,889 inhabitants, in which 1708 are slaves.

CHRISTIAN *d'Or*, a Danish gold coin, current in Holstein since 1775, worth about 13 marks lubs, or 26 marks Danish currency.

CHRISTIANA. Add—By the census of 1810, it contained 6698 inhabitants, 47 being slaves.

CHRISTINA, SANTA,—for CHRISTIANA r. CHRISTIANA.

CHRISTOPHER'S, ST., col. 2, l. 13 from bottom, r. W. long. 62° 43'.

CHROMATE of Iron. See MINERALOGY, *Addenda.*

CHROME, or CHROMIUM, in *Chemistry*, the name of a metal. (See *CHROME.*) Since that article was written, however, some facts have been ascertained respecting this metal and its compounds, which deserve to be briefly mentioned here.

Chrome seems capable of combining with three different proportions of oxygen, and of forming three oxyds, the *green*, the *brown*, and the *yellow* or *chromic acid*. The *green oxyd* may be formed by exposing chromic acid to heat in close vessels, by which means a portion of the oxygen is expelled. It may be also formed in other modes, as by precipitation; in which case it has a dark green colour, and contains water. In this state it readily dissolves in acids, but if exposed to a heat a little below redness, it becomes ignited, diminishes in bulk, and its colour changes to a lighter green. It is now no longer soluble in acids, though it has lost no weight. The *brown oxyd* may be formed by dissolving the above green oxyd in nitric acid, evaporating the solution to dryness, and exposing the dry mass to heat, till it ceases to give out nitrous fumes. A brown brilliant

powder remains, which is soluble in alkalies but not in acids. It is not improbable, that this will be found hereafter to be a *subnitrate* instead of an oxyd. *Chromic acid*, the third oxyd of chromium, is easily reduced to the state of green or protoxyd, by the action of sulphuretted hydrogen, sulphureous acid, and protoxyds of iron, copper, and tin.

The *chromates* have been already described. The *chromate* of lead is the only one much used, which has been lately employed as a paint with great success.

CHRONOLOGY, CHRONOLOGICAL TABLE,

B. C. 710, Sennacherib's army destroyed, &c. Col. 9, l. 20, r. eclipse of the *sun*; for 549 r. 558, Daniel, &c. Col. 11, l. 38, r. Persians; l. 41, r. 466. Col. 12, l. 2, r. Hellenicus. Col. 18, l. *penult.*, insert—at. Col. 22, l. 2, after kingdom; insert—of Cyrené. Col. 29, l. 33, r. Macrinus; l. 55, ditto. Col. 30, l. *ult.* r. Hierocles. Col. 34, l. 24, for one r. that; l. 45, r. Amien. Col. 38, l. 3 from the bottom, add—at Rome. Col. 39, l. 49, r. 206. Col. 41, l. 60 and 61, *dele* Charlemagne, &c. Col. 46, l. 27 and 28 *dele.* Col. 47, l. 7 from the bottom, for Frederic r. Ladiflaus II. Col. 52, l. 2, for Babylon r. Egypt; l. 9, ditto; l. 21, *dele* 1298; l. 27, *dele* the Ottoman empire began. Col. 55, l. 21, 22, *dele.* Col. 58, l. 32, *dele* Brazil discovered; l. 51, for 800 r. 780; l. 64, for North r. South. Col. 59, l. 53, r. Navaro. Col. 63, l. 21 *dele*; l. 61, after Palladio, add—Frobisher fails for Greenland, and again in the following year. See FROBISHER; l. 63, after 1580, insert—see DRAKE. Col. 64, l. 27, *dele* Greenland discovered. Col. 65, l. 32, for April 22 r. June 2. Col. 70, l. 41, after 22, add—in the battle of Gothard; l. 42, *dele* the battle of St. Godard, July 22. Col. 71, l. 53, r. Senefc. Col. 74, l. 15, for July r. February. Col. 75, l. 37, r. ob. 1719, æt. 74. Col. 76, l. 1 and 2, r. When the Spaniards, under the duke of Vendôme, defeated Stareberg. Col. 78, l. 1 and 2, *dele* the Spaniards, &c. May 20; l. 10, for June r. May; l. 33 r. 1744, æt. 56. Col. 79, l. *penult.*, r. 76. Col. 82, l. 38, for Aug. r. September. Col. 84, l. 20, add—(from next paragraph)—The Turkish fleet, &c. July 5, and *dele* these words in that paragraph. Col. 85, l. 4 from bottom, add—Inquisition of Naples abolished. Col. 87, l. 4, 5, and 6, *dele* French, &c. bay; l. 11 and 12, *dele* Ghent, &c. Dec. 12; l. 20, for Yorkshire in 1780 r. Gloucester; l. *ult.* but 2, insert—Ghent and Brussels surrendered. Col. 88, l. 24, after French king, add—appeared at the bar of the convention for the last time, Dec. 26, 1792; and condemned by vote, Jan. 16, 1793; and suffered on the 21st. Col. 89, l. 10 from bottom, add—The French accounts state the number of persons at 60, instead of 3000, and date the catastrophe Aug. 3, instead of Sept. 3. Col. 91, l. 2, after Buonaparte, add—was employed in protecting the directory against an insurrection of the Jacobins, which was his first appearance under a conspicuous character. *Dele* seized Egypt, July 1; l. 48, after Feb. 22, add—1200 Frenchmen landed at Fishguard, and immediately surrendered themselves prisoners. Col. 93, l. 2, after slain, *dele* near Periapatam, and add—in the defence, and within the walls of his capital, Seringapatam; l. 3, after forces, add—under general Harris; l. 54, r. June 14. Col. 94, l. 2, after battle of, for Rhamonia r. Alexandria; l. 3, after English (March 21), add—under sir Ralph Abercromby, who was wounded in the contest, which terminated so honourably to himself and the army, and died a few days after, universally lamented; l. 8, for September r. April; l. 12, after two, r. Spanish ships being blown up; *viz.* the admiral's ship and the San Hermangildo of 112 guns sunk; and the San Antonio of 74 guns, commanded by the chief

CHRONOLOGY.

- de division Le Rey, under French colours, taken by the Superb, July 13; l. 31, *dele* from fir Ralph, &c. to lamented. Col. 98, add—
- 1807.—Battle between the French and Russians, in which the latter were defeated, Feb. 7.—Battle of Friedland, in which the Russians were defeated with great slaughter, June 14.—St. Thomas, a Danish island, taken by the English, Dec. 21.
- 1808.—Battle of Vimiera, in which the whole of the French force, under general Junot, was defeated by fir Arthur Wellesley, Aug. 21.
- 1809.—Cayenne taken by the English and Portuguese, Jan. 15.—Battle of Corunna, in which the French were defeated by the English, Jan. 16.—Battle of Oporto, in which the French were defeated by fir Arthur Wellesley, May 11.—Battle of Alpern and Erlking between the French and Austrians, with dreadful slaughter on both sides, May 21 and 22.—Pope Pius VII. excommunicated Buonaparte, June 10.—At Raab, Austrians defeated by the French, June 14.—At Wagram, Austrians defeated by the French, July 5.—Battle of Talavera de la Reyna, in which the French were defeated by the English and Spaniards, July 27.—Zante, and the rest of the Seven Islands, surrendered to the British in October.—Buonaparte divorced from the empress Josephine, Dec. 17.—General Jubilee through the kingdom, celebrating the entrance of George III. on the 50th year of his reign.
- 1810.—Islands of Faroe and Iceland taken under British protection, Feb. 12.—Amboyna seized by the English, Feb. 17.—Buonaparte married to Maria Louisa of Austria, April 1.—Isle of Bourbon surrendered to the British, July 10.—Battle of Buzaco, in which the French were repulsed with great slaughter by the allied army under lord Wellington, Sept. 27.—Mauritius surrendered to the British, Dec. 3.
- 1811.—Population of London, Westminster, Borough, and neighbouring districts, appeared to be 1,099,104, being an increase, in two years, of 133,139.—Island of Java surrendered to the British, Sept. 18.—Battle of Ciudad Rodrigo, between the French and allied armies, under lord Wellington, which terminated in an orderly retreat of the latter, Sept. 23.—Cavares and Merida, the French, under general Girard, surprised and routed by general Hill, Oct. 28.
- 1812.—Badajos taken by storm by the British and Portuguese, April 6.—Spencer Percival, prime minister of Britain, assassinated in the lobby of the house of commons, by John Bellingham, May 11.—Battle of Salamanca, in which the French were defeated with great slaughter by lord Wellington, July 22.—Smolenko, the Russians defeated by the French, Aug. 16.—Queen's Town, Canada, the army of the United States defeated by the British, Oct. 12.—Polotik, the French defeated by the Russians, and the place taken by storm, Oct. 20.—The French driven from Dorogobudh by the Russians, under Platoff, with great slaughter, Nov. 7.—At Witeplk, the French, under general Victor, defeated by the Russians, under Witgenstein, with the loss of 3000 men, Nov. 14.—Ney's corps, 12,000 of which laid down their arms, defeated by the Russian general Millamdovith, Nov. 17.—At Berezina, the contest terminated in the capture by Witgenstein of a French division of 8800 men, Nov. 28.—Near Wilna, a French column was destroyed by Platoff, when a general and 1000 prisoners were taken, Dec. 11.
- 1813.—Concordat signed between pope Pius VII. and Buonaparte, at Fontainebleau, Jan. 25.—At Bejar, in Spain, the French were defeated by general Hill and the allied Spaniards, Feb. 20.—At Lunenburg, the French were defeated by the united army of Russians and Prussians, with the loss of general Morand, 100 officers, and 2200 privates, and two pieces of cannon, April 2.—At Fort George, on the Niagara, the British were defeated by the Americans, May 27.—At Vittoria, the French, under Joseph Buonaparte, were defeated by lord Wellington and the allied Spaniards, June 21.—Pyrenées, Soult was defeated, with immense slaughter, by lord Wellington and the Spaniards, July 28.—St. Sebastian was taken by storm, by general Graham, July 31.—Before Dresden, the allied army of Austrians, Russians, and Prussians, was defeated by the French, August 28.—At Toplitz, the French were defeated by the allied Austrians, Russians, and Prussians, Aug. 30.—At Dennewitz, the French were defeated with great loss by the Crown Prince of Sweden, Sept. 8.—At a Moravian village on the Thames in Canada, the British were defeated by the Americans, Oct. 5.—At Mockero, a desperate conflict occurred between the French and the allied army of Austrians, Russians, and Prussians, the place having been taken and re-taken five times, terminating in a defeat of the French, Oct. 11.—Before Leipzig, a second general engagement took place, the result of which was, a loss to the French of 10,000 men, in killed, wounded, and prisoners, with 63 pieces of artillery, and the desertion of 17 German battalions, Oct. 18.
- 1814.—At Rothiere, the French, under Napoleon, were defeated by the allied Russians and Prussians, with the loss of 3000 prisoners, and 26 pieces of cannon, Feb. 21.—Bourdeaux entered by lord Wellington, March 12.—At Tarbes, Soult was defeated by lord Wellington, March 20.—Paris entered by the emperor of Russia, at the head of his troops, March 31.—Buonaparte renounced, for himself and heirs, the throne of France, and accepted the Isle of Elba for his retreat, April 5.—The states of Parma, Placentia, and Guelfella, conferred on Maria-Louisa by treaty, April 5.—At Toulouse, the French were defeated by lord Wellington, April 10.—Buonaparte embarked for Elba, April 28.—Treaty of Paris signed by the ministers of the allied sovereigns for the protection of France, May 30.—Pope Pius VII. returned to Rome, and resumed his functions in May.—The emperor of Russia, with the king of Prussia, prince Blucher, and other illustrious persons, entered London amidst great rejoicings, June 8.—Inquisition of Spain restored by Ferdinand VII. July 21.—A grand jubilee on celebrating the peace, and the centenary of the accession of the house of Brunswick, Aug. 1.—Tuscany, after having been ceded to Buonaparte in 1807, restored in 1814.—Washington, in North America, taken by the British, and the principal buildings destroyed by fire, Aug. 24.—Hackney chariots licensed in London, not to exceed 200.
- 1815.—Buonaparte quitted Elba, and landed at Cannes, March 1.—King of Candy deposed, and the sovereignty vested in Great Britain, March 2.—Buonaparte arrived at Fontainebleau, March 20.—Treaties for the maintenance of the treaty of Paris, between England, Russia, and Prussia, signed at Vienna, March 25.—Buonaparte abolished the slave trade, March 29.

—Potofi evacuated by the royalists and entered by the Buenos Ayres army, under general Rondeau, April 5.—Florence evacuated by the Austrians, and entered by the Neapolitans, April 6.—Battle of Waterloo, in which the whole French army, with Buonaparte in command, was defeated by the English and Prussians, with immense slaughter, June 18. (See WATERLOO.)—Buonaparte retired to Paris after his defeat at Waterloo, June 20; and abdicated in favour of his son, June 23.—Paris evacuated by the French and occupied by the allied army, July 3.—Louis XVIII. restored to Paris, and resumed the government, July 8.—Buonaparte failing to sail from Rochfort to America, surrendered himself to captain Maitland of the Bellerophon, July 15.—Army of the Loire, under generals Suchet and Davoust, submitted to the government of Louis XVIII. July 16.—Bourdeaux submitted to the government of Louis XVIII. July 14.—Buonaparte transferred at Torbay from the Bellerophon to the Northumberland, and sailed for the island of St. Helena, decreed by the allied sovereigns to keep his residence for life, Aug. 8.—And arrived thither, Oct. 16.—The Museum of the Louvre was dismantled by the allied sovereigns of the treasures of art which had been lodged there in consequence of the depredations of Buonaparte. His pillage in Italy, which was conveyed to Paris, consisted of 66 pieces of sculpture, and 47 capital paintings. Among the former, were the following chef-d'œuvres:—the Apollo, the Antinous, the Adonis, the Dying Gladiators, the Laocoon, the Two Sphynxes, and the Tomb of the Muses. Among the latter, were the principal paintings of Raphael, Perugino, Guercino, Annibal Carracci, Guido, Titian, and Correggio. In the national library were deposited a MS. of Josephus's Antiquities on papyrus, a MS. Virgil of Petrarch, with notes in his hand-writing, and 500 of the most curious MSS. which were in the library of the Vatican.

1816.—Treaty with the Nepalese in India, ratified March 15.—Princess Charlotte of Wales married to the prince of Saxe-Cobourg, May 12, the annual sum of 60,000*l.* per annum having been previously settled upon him by parliament.—Declaration of independence of the representatives of the United Provinces of South America in general congress, published at Montevideo, July 19.—Genoa transferred to the king of Sardinia.—Lotteries prohibited, on account of their immoral tendency, by the grand duke of Hesse, October.

1817.—Inhabitants of Chili restored to freedom by the Buenos Ayres army under general San Martin in February.—A revolutionary insurrection in Pernambuco in March.—Above 600 petitions for parliamentary reform, presented by sir Francis Burdett, strewed the floor of the house of commons, March 4.—The measure for repealing the penal laws against Catholics, which had been negated in the house of commons by 213 against 109, June 1, 1810;—and again by 146 against 83, and in the house of lords by 121 against 62, in 1811;—and again in the former house by 300 against 215, and in the latter by 174 against 102, in 1812;—and again in the former house by 251 against 247, May 13, 1813;—and again in the same house by 228 against 147, and in the house of lords by 86 against 60, in 1815;—and again in the house of commons by 172 against 141, and in that of the lords by 73 against 69, in 1816;—and again in the former

house by 245 against 221, and in the latter by 142 against 90, April 1817.—A bill admitting Catholics to promotion in the army and navy passed June 1817.—Loan of twelve millions advanced to the French government by English merchants.

VOL. VIII.

CHRYSOPRASE. See MINERALOGY, *Addenda*.
CHUDLEIGH, l. 3, *r.* contains, by the return of 1811, 370, &c.: l. 14, *r.* being 1832.
CHUKOTSKIJA, for Tschutski *r.* Tchukstskija.
CHUMLEIGH, l. 10, *r.* by the return of 1811 is 282, of inhabitants 1340.

CHURCH-STRETTON. In 1811, the township contained 100 houses, and 398 persons; *viz.* 184 males, and 214 females.

CHURDER, signifies, in India, a staff-bearer, or an attendant on a man of rank. He waits with a long staff plated with silver, announces the approach of visitors, and runs before his master, proclaiming aloud his titles.

CHUSISTAN, l. 14, add—Chusitan, or Kuzitan, the ancient Sufiana, is now divided between the territories of the Chab Sheikh, and those that form the government of Shulter. The former extend from the banks of the Tab to the conflux of the Karoon and Abzal, and from the shore of the Persian gulf to a range of hills which skirt the valley of Ram Hormuz to the south. This country, though watered by the Karoon and the rivers Zab and Jerahi, does not abound, as some travellers have asserted, in grain, rice, and dates; the greatest part of it consisting in vast sandy plains and morasses, wholly destitute of cultivation. The most fertile parts are those in the environs of Dorak, the capital, and on the borders of the Hafar and Shat-ul-Arab, which produce dates and rice, and scanty portions of wheat and barley. The northern and western parts of the country afford tolerable pasturage, and here the wandering tribes pitch their tents. The principal towns are, Dorak, Ahwaz, Endian, Mahoor, Goban, and Jerahi. Dorak, or more properly Felahi, is situated in low marshy ground, on the banks of two of the branches of the Jerahi. The walls of mud are two miles in circumference, sixteen feet thick, and flanked with round towers. The majority of the inhabitants, amounting to about 8000, prefer living in the suburbs; under the shade of the date-trees. Dorak is the residence of the Sheikh, who has in it a miserable palace. Its manufacture is the abba, or Arabian cloak, which is exported in great numbers all over Persia and Arabia. Ahwaz, or Ahous, formerly a flourishing city, and capital of a province of the same name, is reduced to a wretched town, containing 600 or 700 inhabitants, situated on the banks of the Karoon, 48 miles S. of Shulter. Endian lies in N. lat. 30° 18', 20 miles from Zeitoon, and 72 from Dorak, occupying both banks of the Tab, and nearly two miles in circuit. This town trades with Bassora and Behaban, and has a population of between 4000 and 5000 souls. Mahoor lies half way between Endian and Dorak, in the desert, and two miles from the sea, containing about 700 persons, trading with Bassora and the Arabian coast. The revenues of the Chab Sheikh amount to five lacs of piastrs, or about 50,000*l.* sterling, and he can bring into the field 5000 horse and 20,000 foot. The territories attached to the government of Shulter constitute the finest portion of Sufiana. M'Kinneir's Persian Empire.

CHYAZIC ACID, in *Chemistry*. See CYANOGEN.
CHYLE, and CHYMÉ, *Chemical Properties of*. These have

have been already described under **DIGESTION**, and we have here only to notice briefly the late experiments of **Dr. Marcet** and **Dr. Prout** on the subject. These gentlemen were furnished by **Mr. Atley Cooper** with specimens of chyle and chyme taken from different dogs, some of which had been fed on vegetable and others on animal food. Their experiments coincide almost exactly in every respect, so that it will be necessary only to mention **Dr. Marcet's** results. 1. The specific gravity of the ferous portion of chyle appears to be between 1021 and 1022, whether formed from vegetable or animal food. 2. The quantity of solid residue, comprehending both saline and animal matter, left by the evaporation of chyle at the heat of boiling water, may be generally stated to vary between 50 and 90 parts in 1000. 3. The quantity of saline matter appears to be about 9 parts in 1000, being the same proportion of salts which is found in all other animal fluids. 4. The chyle from vegetable food appears to yield, by analysis, about three times as much charcoal as that from animal food. 5. The chyle from animal food is much disposed to putrefy, and generally begins to undergo that change in three or four days; while that from vegetable food can be kept for weeks, or even sometimes for months, without undergoing putrefaction. 6. The coagulum of chyle is more inclined to putrefy than the ferous part. 7. The chyle formed from animal food alone is always milky; and in standing, an unctuous white creamy substance collects on the surface: its coagulum is opaque, and has a pink hue. 8. The chyle from vegetable food is commonly transparent, or nearly so, like common serum. Its coagulum is nearly colourless, like an oyster, and no creamy substance rises to the surface. 9. The principal ingredient of the animal matter of chyle is albumen; but besides albumen, chyle, especially when derived from animal food, contains globules of an oily substance, which bears a strong resemblance to cream. 10. By the destructive distillation, chyle gives first a liquor impregnated with carbonate of ammonia, and afterwards a heavy fixed oil. The chyle from animal food yields a greater proportion of both these products, but the residue, whatever the mode of analysis be, contains less charcoal than the chyle from vegetable food. Iron is readily detected in the residue of chyle, mixed with the salts and carbonaceous matter. 11. Chyme from vegetable food yields much more solid matter than any other animal fluid, though it appears to contain rather less saline matter. 12. Chyme contains albumen. 13. It yields about four times as much charcoal as chyle from vegetable food. 14. Neither chyle nor chyme contains any gelatine.

Dr. Prout ascertained the curious fact in different animals, that albumen never exists in the stomach, even when the food is perfectly digested, but that an albuminous principle is formed the moment it enters the duodenum and comes in contact with the bile. He was also induced to conclude, that this albuminous principle becomes more abundant, and more perfectly albuminous, the nearer it approaches the sanguiferous system, so that it seems to undergo important changes between the intestines and thoracic duct. See *Med.-Chir. Trans.* vol. v. and *Annals of Medicine and Surgery*, vol. i.

CICCA, *dele* See **TERME** at the close.

CICUTA. Annex—See **CONIUM**.

CIGOLI, *r. Ludovico CARDI*.

CIMEX, col. 2, l. 35, add—This offensive creature was in a great degree unknown in the days of our ancestors. Its origin is traced to the year 1670, when it was imported among the timber used for rebuilding the city of London after the great fire of 1666; but it was known at a much earlier period than this, though it was much less common

than it is at present. A circumstance is mentioned by **Mouffat**, which proves that these insects were known at **Mortlake**, in **Surry**, in the year 1583. They live entirely by suction, employing for this purpose their sharp and fine trunk or proboscis, which lies in a straight direction beneath the breast. Like the gnat and some other insects, they probably infuse some quantity of irritating fluid into the wound they make before they suck the blood of the animal, which they attack, as the swelling is often very considerable, and attended with severe itching. In winter they conceal themselves behind the walls, wainscot, and in other neglected places; and on return of warm weather they emerge from their concealment. **Mr. Baker** says, in his "Microscope made easy," that the bug is one of the best subjects for exhibiting a microscopical view of the circulation of the blood.

CIMOLIA, *dele* **PIPE-CLAY**.

CINCHONA, *Chemical Properties of*. **Vauquelin** some time ago published a set of comparative experiments on all the different species of cinchona which he could procure, in order to determine, if possible, how far they differ from each other, and what the constituents are on which their virtues depend. They may be divided into three distinct sets.

1. Those whose infusions precipitate the infusion of nutgalls, but not that of glue.
2. Those whose infusions precipitate glue, but not the infusion of nutgalls.
3. Those whose infusions precipitate glue, nutgalls, and tartar emetic.

The following Table exhibits the effects of the different re-agents upon all the barks tried. It is difficult, however, as **Dr. Thomson** has remarked, to determine, in all cases, the real name of some of the specimens, as **Vauquelin** has not given us the botanical name.

Barks.	Precipitate by Glue.	Precipitate by Tannin.	Precipitate by Tartar Emetic.
Yellow bark -	white	copious	copious
Quinquina of Santa Fé -	reddish	—	—
Grey quinquina -	white	copious	white
Quinquina gris canelle -	brown	—	—
Red quinquina -	red	—	yellowish-white
Grey quinquina -	white	yellow	yellowish-white
Quinquina gris plate -	—	—	—
Cinchona pubefcens -	—	yellow	yellowish-white
Cinchona officinalis -	—	yellow	—
Cinchona magnifolia -	copious	—	—
Quinquina pitton vraï -	—	copious	copious

Barks brought from Peru by Humboldt.			
Quinquina of Loxa -	copious	copious	copious
Quinquina, white, of Santa Fé -	—	—	—
Quinquina, yellow, of Santa Fé -	—	copious	copious
Quinquina, red, of Santa Fé -	copious	—	—
Quinquina, yellow, of Cuenca -	—	—	—
Quinquina, ordinary -	copious	copious	copious
Infusion of nutgalls -	copious	—	yellow-white
Oak bark -	copious	—	—
Cherry-tree bark -	—	—	—

It is very probable, that several specimens in the above Table are duplicates, though we have no means of ascertaining this with certainty. All the above barks produced a green colour with iron, and most of them produced a green precipitate with that metal.

The substance which precipitated tannin was brown, of a bitter taste, and less soluble in water than alcohol. It precipitated tartar emetic, but not glue. It resembled the refins in some respects, though it gave out ammonia when distilled. Upon the whole, these experiments, though they establish the fact that differences exist among the various species of cinchona, throw very little light upon the nature of their active ingredient or its mode of operation.

CINCINNATI, *dele* l. 9 and 10, and after paper, add—The number of public buildings, or dwellings, is from 1300 to 1400; of inhabitants, in 1810, 2540, and in 1817, 8000, all whites; the laws of Ohio prohibiting slavery, and even the settlement of free negroes, in the state, except in certain cafes. About 400 houses are built of stone or brick, many of which are three stories high, and in a superior style. The public edifices are of brick. Numerous manufactures are already established, and a very extensive commerce is carried on by river navigation with Pittsburg, New Orleans, and all the western states; and by waggons with the interior country. The manners and drefs of the inhabitants resemble those of the English. Cincinnati is said to be the border of the western world, and will probably be the largest city in America at no very distant period. Forty years ago it was the resort of Indians; and the whole surrounding country was a wilderness, full of wild beasts and savages.

CINNAMON STONE. See MINERALOGY, *Addenda*.

CIONE, *ORGAGNA, dele*.

CIPHER, col. 36, l. 35, for syllables *r*. letters.

CIRCAR. At the cloie, add—*Circar* denotes generally the head of affairs, or the state and government, as well as the great division of a province. It is also a name used by Europeans in Bengal to signify the Hindoo writer and accountant, employed by themselves or in the public affairs.

CIRCLE, col. 5, l. 27 from the bottom, for 7854 *r*. 157143. Col. 6, l. 3, *Plate* 1, add—of *Astronomical Instruments*. Col. 68, l. 5 from the bottom, for cannot be *r*. cannot but be.

CIRENCESTER, col. 3, l. *penult*. By the return in 1811, the borough of Cirencester contained 902 houses, and 4540 persons; *viz.* 2030 males, and 2510 females: 207 families being employed in agriculture, and 526 in trade and manufactures.

CISTOTOME. See **CYSTOTOMY**.

CITRIC ACID, in *Chemistry*. This acid has been lately analysed by Gay Lussac and Thenard, and still more recently by Berzelius. The results obtained by these able chemists differ considerably, which are partly to be ascribed to the presence of water in the acid analysed by Gay Lussac. (See **ANALYSIS of Organized Substances**.) The following Table exhibits these results.

	Hydrogen.	Carbon.	Oxygen.
Gay Lussac	6.330 +	33.811 +	59.859
Berzelius	3.800 +	41.369 +	54.831

If we consider the numbers of Berzelius as most accurate, citric acid may be supposed to consist of two atoms hydrogen, four of carbon, and four of oxygen, and the weight of an integrant atom will be 72.5. Dr. Thomson, however, is disposed to consider another atom of hydrogen, or three atoms, to be present in citric acid, which supposition he states will render the weight of its integrant atom more accordant with the best analyses of the citrates.

CLACKMANNAN. Add—In 1811, the parish of Clackmannan contained 693 houses, and 3605 persons; *viz.* 1657 males, and 1948 females.

CLACKMANNANSHIRE. By the returns of 1811, this shire contained 1995 houses, and 12,010 persons; *viz.* 5715 males, and 6295 females: 280 families being employed in agriculture, and 893 in trade and manufactures.

CLADIUM, in *Botany*, from κλαδος, a twig, alluding to its habit.—Browne Jam. 114. Brown Prodr. Nov. Holl. v. 1. 236.—A genus founded on *Schoenus Maritimus* of Linnæus. (See **SCHOENUS**.) This plant grows in the West Indies and New Holland, as well as in Europe. Mr. Brown, who defines thirteen New Holland species, gives the following

Eff. Ch. Glumes imbricated every way, one or two-flowered; the outer ones empty. Germen without bristles or scales underneath. Style deciduous, without a joint at the base. Nut naked and smooth, with a smooth kernel.

CLADONIA, from its twiggy habit, a name given by Hoffmann to a tribe of Lichens, now sunk in **CENOMYCES**; see that article.

CLAIBORNE, in *Geography*, a county of East Tennessee, having 4798 inhabitants, of whom 327 are slaves.—Also, a town of Mississippi territory, in Adams' county, containing 1538 inhabitants, of whom 14 are slaves.

CLAIR, a county of the Illinois territory, containing nine townships, and 5007 inhabitants, of whom 40 are slaves.

CLAIR, St. Add—It is a town of Butler county, having 1180 inhabitants.—Also, a town of Columbiana county, in the same state, having 1003 inhabitants.—Also, a township of Pennsylvania, in Alleghany county, containing 3080 inhabitants.

CLARCKIA, in *Botany*, so named by Mr. Pursh, in honour of general Daniel Clarck, the companion of the late governor Lewis, in his botanical travels.—Pursh 260.—Lafc and order, *Obandria Monogynia*. Nat. Ord. *Calycanthemæ*, Linn. *Onagres*, Juss.

Eff. Ch. Calyx four-cleft, tubular. Petals four, hastate. Four filaments without anthers. Stigma in four dilated lobes. Capsule inferior, of four cells.

1. *C. pulchella*. Elegant *Clarckia*. Pursh n. 1.—On the Kookkooky and Clark's rivers. *Governor Lewis*. Biennial, flowering in June. Stem erect, a foot or more in height, round, leafy, slightly branched upwards. Leaves scattered, sessile, linear, entire, smooth, an inch or two long. Flowers axillary, solitary, somewhat stalked, large and handsome, of a fine purple or rose colour. Petals in three equal, abrupt, spreading lobes. Anthers only four, involute. Stigma pale yellow, in four broad, rounded, petal-like lobes.

CLARE, in Suffolk. By the returns of 1811, the parish contained 253 houses, and 1170 persons; *viz.* 591 males, and 579 females.

CLAREMONT, l. 6, *r.* 2094.—Also, a town of Massachusetts, in Hampshire county, having 987 inhabitants.

CLARENDON, a township of America, l. 4, after contents, insert—1797.

CLARKE. Add—The county contains 10,981 inhabitants, of whom 2695 are slaves; and the town has 538 persons, including 239 slaves.

CLARKSBURG. Add—Also, a town of Massachusetts, in Berkshire county, having 231 inhabitants.—Also, a county of Georgia, whose town is Athens, containing 2405 inhabitants, of whom 30 are slaves: its town contains 134, including 4 slaves.

CLASSIFICATION of Animals, &c. l. 33, insert—For the classes of animals, formed from a knowledge of the

the internal structure and according to the Linnæan system, see NATURAL HISTORY. Col. 2, l. 42, *r.* a strong cervical, &c.; l. 62, *dele* from Man to education, l. 65. Col. 3, l. 23 from bottom, after ant-eaters, insert—; Col. 4, l. 33, for species *r.* animals. Col. 5, l. 29, for divided *r.* decided. Col. 6, l. 15, for and *r.* or of. Col. 7, l. 11, for when *r.* where.

Page 5, under DIGITATA, col. GENERA, l. 3, for Uomalus *r.* Wombatus, and for *Womlat r. Wombat*. Col. SUB-GENERA, l. 26, for *Scalope r. Myrmica Shrew*; l. 35, for *Rinolophus r. Rinolophus*; l. 54, *r.* Myrmecophaga. *Dele l. ult.*

Page 6, col. GENERA, l. 13, *dele Grampus*; l. *penult. r. Touyou*.

Page 7, col. FAMILIES, l. 2, *r.* Aleoformides. Col. GENERA, l. 9, *r.* Otis. Col. FAMILIES, under PASSERINÆ, l. 1, *r.* CRENIROSTRATÆ; l. 2, *r.* DENTIROSTRATÆ; l. 3, *r.* PLENIROSTRATÆ; l. 4, *r.* CONIROSTRATÆ; l. 5, *r.* SUBULIROSTRATÆ; l. 6, *r.* PLANIROSTRATÆ; l. 7, *r.* TENUIROSTRATÆ. Col. GENERA, l. 7, *r.* *Momot*; l. 13, after Oriolus, insert—Buphaga...Beef-eater; l. 26, *r.* Trochilus, and also in next column.

Page 8, col. FAMILIES, l. 1, *r.* CURVIROSTRATÆ; l. 2, for *o* denticulated *r.* and cellular interiorly—and LEVIROSTRATÆ. Col. SUB-GENERA, for Kakatoe *r.* Cacatua; for Ara *r.* Macao. Under GRALLATORIÆ, col. FAMILIES, *r.* CURVIROSTRATÆ, LEVIROSTRATÆ, TENUIROSTRATÆ, PRESSIROSTRATÆ, and BREVIROSTRATÆ. Under ANSERINÆ, col. FAMILIES, *r.* SERRIROSTRATÆ, LONGIPENNÆ, and BREVI-PENNÆ. Col. SUB-GENERA, after Alca, insert—Torda, and remove Aphendoyta—*Manchot* to this column.

Page 9, col. GENERA, after Vultur, insert—Gypætos, and after Falco, Secretarius—*Secretary*. Col. SUB-GENERA, *dele l. 3* and l. 9. Under CHELONIA and Families, l. 2, *r.* Fluvialia. Under SAURIA, col. GENERA, l. 3, *r.* Tupinambis; l. 4, Uroplatus; l. 5, Lophyrus; l. 7, *r.* *Guana*; l. 10, *r.* Chameleo; l. 13, Anoius; l. 16, Chalcides; after Seps, add—Bipes and Chirotes.

Page 10, under BATRACHIA and FAMILIES, for Anoura *r.* ECAUDATA; and for DELOURA *r.* CAUDATA. Under PISCES, col. ORDERS, l. 3, *r.* CHISMOPNEOSI, TREMATOPNEOSI, and OPHICHTHYOIDES.

Page 11, *r.* TREMATOPNEOSI, in the same column, *r.* CHISMOPNEOSI. Under TELEBRANCHIATI, l. 4, after fins, add—which are joined. Under GENERA, *r.* Lepidogaltrus. Ovoides, MOON-FISH.

Page 12, under FAMILIES, *r.* PANTOPTERI and PEROPTERI. Under GENERA, *r.* Notopteres. Under THORACICI, col. 1, *r.* nearly as high as long. Under GENERA, *dele l. 2*; *r.* Enoplofus, Acanthopodus, Chrysofotofus, Capros, Achirus.

Page 14, col. GENERA, *r.* *Centropome*, Gomphofus, Ophronemus, Pognonias, Hologymnifus, Dipteron, Coryphenonid, Prionotus, Peristedei, Stiothoprus.

Page 15, under GENERA, *r.* Anolotomus, Ompolk, Macropteronotus, Hypofotomus, Cheilodactylus, Galteroplancus, Serra Salmo, *Sun-fish*, Synodus, Stylophorus.

Page 16, *r.* OPHICHTHYOIDES. Under GENERA, Murenoblenna, Ocyodes, Leucofia, Galatæa, Pennax, Phronima; l. 11, for nervules *r.* nervures; l. 12, for coiled *r.* coiled.

Page 16, TESTACEA. Col. GENERA, *r.* Ozolus. Under OCTOPODA, *r.* distinct and small; jaws wanting, or formed in pinners, claws, or as a sucker.

For SUCTARIA *r.* ACARIDES.

Aceras.
Trombidium.
Hydracna.
Leptus.
Atoma.

Under POLYPODA, FAMILIES, *dele* macl, and insert—MYRIOPODA for LONGIFORMIA; and in l. ult. *dele* body of an oval figure, and insert—QUADRICOORNIA for OVIFORMIA.

Page 17, *r.* HEXAPODA. Under GENERA, *r.* Bombylius, Stomoxys, Rhingia, Stratyomis; after Ceria, Midas, Cerochetus.

Page 18, col. 1, l. 1, *r.* crossed; and again, l. 2, under FAMILIES, *r.* FRONTIROSTRA and PLANIPENNATA. Under GENERA, *r.* Promecopsis, Cercopsis, Aleyrodas.

Page 19, under FAMILIES, *r.* APIARIA CHRYSIDEA. Under GENERA, Eulophus.

Page 21, under FAMILIES, *r.* Sternuxa, Mollipennata. Under GENERA, *r.* Bembidio, Clivina, Hyphydrus, Cebrio, Throfeus, Ptilinus, Necrophorus, Drilus.

Page 22, col. 1, *r.* hard; antennæ. Col. 2, *r.* often moniliform. Under FAMILIES, ANGUSTIPENNATA and SOLIDIPENNATA. Under GENERA, Lagria, Zonitis, Serropalpus, Celopus, Horia, Sarotrium, Boletophagus, Anilooma, Eurychera, Akis, Sepsidium, Zophois.

Page 23, under FAMILIES, l. 2, *r.* CYLINDRIFORMIA. Under GENERA, Oxyfoma, Trogofita, Cerambyx, Attelabus for Spondilis; *dele* Donacia, Necdalis for Melorchus, Clythra. In SUPPLEMENTARY TABLE, col. 2, after pediculated, insert—*a*;—Under ORDERS, *r.* COLEOPTERA.

Page 24, under SUB-ORDERS, *r.* PTEROPODA, GASTEROPODA. Under GENERA, after Clio, insert—Cymbulia; *r.* Pneumodermon, after it, insert—Heliccia; *r.* Eolidia, after it, insert—Glaurus; after Limax, insert—Onchidium; after Sigaretus, insert—Pleurobranchus, Dollabella, Parmacella; after Patella, insert—Capulus; after Crepidula, insert—Emarginula; *r.* Natica, *r.* Monodon; after Planorbis, insert—Limnea; after Helix, insert—Janthine, Phasianella.

Page 25, under SUB-ORDERS, *r.* APODA; and under GENERA, after Thalia, insert—Botryllus; *r.* Anodantes; *r.* Pholas, and *dele* Cyrtodaria.

Page 26, under SUB-ORDERS, *r.* SETEGERI. Under GENERA, after Aphroditia, insert—Amphinoma; after Dentalium, insert—Arenicola; *dele* Fafciola, *Fluke*; *r.* *Animated Hair*; *r.* Scolex, and after it, insert—Lerneæ, Nemertes. Under ACTINOIDEA, col. GENERA, *r.* Siponculus, Siponcule; after Actinia, insert—Lucernaria; after Rhizofotoma, add—Cestum, *Venus's girdle*, Diphylas, Porpita, Vellea, Phylalia, Phyllophora; *dele* the SUB-GENERA.

Page 27, *dele*, in l. 1, able to change from one place to another. Under GENERA, after Hydra, insert—Coryna, Cristatella, Pedicellaria; *r.* Pennatula, Vibrio-vibrio, Volvox-volvox.

CLAUDIO, refer to GELEE! *Claude*, and *dele* GALLIE. CLAUSENBURG. See COLOSVAR.

CLAY, in *Geography*, a county of Kentucky, containing 2398 inhabitants, of whom 141 were slaves in 1810.

CLAY-STONE. See MINERALOGY, *Addenda*.

CLEAR CREEK, in *Geography*, a township of Fairfield county, in Ohio, containing 1126 inhabitants.

CLEARFIELD, a county of Pennsylvania, containing a town of the same name, which in 1810 had 875 inhabitants.

—Also, a township of Butler county, in Pennsylvania, containing 288 inhabitants.

CLEARING, denotes a method adopted by the city bankers for exchanging the drafts on each other's houses, and settling the differences. In pursuance of this method, at half-past three o'clock in the afternoon, a clerk from each banker attends at the clearing-house, where he brings all the drafts on the other bankers which have been paid into his house during the course of the day; and he deposits them in their proper drawers (a drawer being here allotted to each banker): he then credits their accounts separately with the

articles which they have against him as found in his drawer. Balances are then struck from all the accounts, and the claims transferred from one to another, until they are found up and cancelled, that each clerk has only to settle with two or three others, and their balances must be immediately paid either in cash or Bank of England notes. Such drafts as are paid into a banker's too late for clearing, are sent to the houses on which they are drawn to be *marked*, which is understood as an engagement that they will be paid the next day. Kelly's Cambist.

CLEVELAND, in *Geography*, a town of Cayhoge county, in Ohio, having, in 1810, 547 inhabitants.

CLERGY, col. 5, l. 44. By 41 Geo. III. c. 63. no person ordained a priest, or deacon, or being a minister of the church of Scotland, shall be capable of being elected to serve in parliament as a member of the house of commons. Such person's election shall be void; and if after his election he shall be ordained a priest, &c. he shall vacate his seat; and if he sit or vote as a member of the house, he shall forfeit 50*l.* for every day in which he shall sit or vote; provided such prosecution be commenced within twelve calendar months after such penalty shall be incurred. L. 54, after canon law, add—But now by 43 Geo. III. c. 84. certain provisions of 21 Hen. VIII. are repealed, and other provisions made in lieu thereof; and it is enacted, that after the passing of this act (7th July 1803) spiritual persons against whom no action shall have been brought under the recited act are indemnified; and contracts which would have been good after passing this act are valid notwithstanding that act; and proceeding may be had under certain conditions. And any spiritual person may take to farm to himself or to any person or persons, to his use, by lease, grant, words, or otherwise, for term of life or of years, or at will, any messuage, mansion, or dwelling-house, with or without orchards, gardens, and other appurtenances, although not in any city, borough, or town, notwithstanding the said first recited act or any other.

And it shall also be lawful for any spiritual person, having or holding any donative, perpetual curacy, or parochial chapelry, not having sufficient glebe or demesne lands annexed to or in right of or by reason of his benefice or cure, or chapelry, or for any stipendiary curate or unbeneficed spiritual person, with the consent in writing of the bishop of the diocese, to take to farm to himself, or to any person to his use for a limited number of years, any farm or farms, lands, tenements, or hereditaments, that may under all the circumstances appear to such bishop proper to be taken by such spiritual person, for the convenience and accommodation of his hospitality only, without being subject to any pains, penalties, or forfeitures, under the said first recited act or any other: provided that nothing herein contained shall extend to authorise any non-residence of such spiritual person.

CLERMONT, a county of America, l. 5, r. 1810, 9965.

CLIFFORD, a township of Luzerne county, in Pennsylvania, having 675 inhabitants.

CLINTON, l. 12, r. 1810, 8002; l. 13, of whom 29 are slaves.

CLINTON, col. 2, l. 21, after Hallowell, add—containing 1030 inhabitants.—Also, a county of Ohio, containing 2674 inhabitants.—Also, a township of Knox county, in Ohio, including 714 inhabitants.—Also, a town of Georgia, in Jones' county, containing 6023 inhabitants, of whom 13 are slaves.

CLITHEROE. In 1811 this borough contained 299 houses, and 1767 persons; viz. 826 males, and 941 females.

CLITOMACHUS, l. 2, for Carthage r. Athens.
CLOCK. In col. 53, l. 18 from bottom, we have referred to **PYROMETER** for the description of Troughton's new instrument, by which he tries the compensation of his tubular pendulums; but on application both then and recently made to him for permission to describe it, we were informed that this instrument has not yet been completely finished, and consequently not described by him. We can, however, now give our readers some idea of its principle and construction without a drawing. The pendulum is suspended vertically in an enclosed box of wood, made fast to a wall, and heated with lamps placed within; then a horizontal metallic bar, about thirty inches long, has one of its ends inserted through the side of the box into a hole made in the centre of oscillation of the ball, while the middle of it is supported by a short bearing-piece driven into the wall, and projecting a few inches therefrom: on the remote end of this bar, a micrometer-screw is fixed, that adjusts a delicate spirit-level, borne by it; so that whenever the interior end of this horizontal bar is depressed by the elongation of the pendulum, the bubble runs to the exterior end of its tube, and indicates the quantity of elongation by its run, as measured by the micrometer during its re-adjustment; and on the contrary, when a contraction takes place in the pendulum, the bubble runs to the interior end; but when it remains stationary, on the application of heat to the pendulum, it is considered that the compensation is perfectly adjusted. Two thermometers are placed at a distance from each other in the box, and are viewed through slips of glass inserted in the front of the box near the top and bottom, to shew that the heat is equally diffused; and thus the expansion of any simple rod may be taken, while the apparatus is removed sufficiently from the heat applied within the box, while the least quantity of expansion may be ascertained, without danger of error, by means of the micrometrical level. It is hardly necessary to remark, that when a simple rod has its expansion thus ascertained in different degrees of temperature, its inferior end must rest on the inner end of the horizontal bar, while its superior end must be pressed upwards against a pin in the wall instead of being suspended; in which case, a counterpoise must be placed on the horizontal bar near the level, to hold the vertical rod up to its bearing. The peculiar advantage of trying the final adjustment of a pendulum of Troughton's construction for compensation after it has been brought to time, is, that the spring by which the pendulum is suspended is *included* in the determination of the total result of all the contrary expansions; which cannot be said of any other method, except that which results from actual experience, in observing the variations of rate at opposite seasons of the year, which is a tedious method, accomplished only at the expence of much observation and loss of time after each new adjustment.

CLOCK-MAKING, col. 2, l. 13 from bottom, for radii *r*. diameters.

CLOWES, l. 2, for fifteenth r. sixteenth.

CLUNCH. This is also a name given to Stourbridge clay, which lies at a great depth in the earth, under the bed of coal: it is a grey clay, of a sandy nature, and better adapted for making large crucibles and fire-brick than pebbles any in Europe. Parkes's Ess. v. i.

CLUPEA ALOSA, col. 2, l. 39, for it is not of *r*. it is one of.

CLYSTERS, in *Farricry*, are of great use in allaying many acute complaints to which horses are subject; and Mr. Clark recommends for this purpose simple clysters of warm water or thin water-gruel. The instrument which

he prefers for administering clysters is a simple bag or ox-bladder, holding two or three quarts, tied to the end of a wooden pipe about fourteen or fifteen inches long, and an inch and a half in diameter where the bag is tied, and tapering to the extremity, where the thickness should suddenly increase, and be rounded off to the point as smooth as possible. The hole through the pipe may be made sufficiently large for admitting the end of a common funnel, by which the liquor may be poured into the bag. Mr. Clark recommends the following clysters for the several purposes to which they are applied. An *emollient* clyster may be composed of two or three quarts of the water-gruel, 6 oz. of coarse sugar dissolved in the gruel, and the same quantity of olive-oil added to it. For a *laxation* clyster, he directs two or three quarts of thin water-gruel, 8 oz. of Glauber's salt (or common salt), and 6 oz. of olive-oil. For a *purging* clyster, he recommends 2 oz. of fenna, two quarts of boiling water, the fenna being infused and the liquor strained off, with the addition of syrup of buckthorn and common oil, of each 4 oz. An *anodyne* clyster may be prepared with one pint of the jelly of common starch, or infusion of linseed, and 1 oz. or about two table-spoonsful of tincture of opium. For a *nutritive* clyster, he directs three quarts of thick water-gruel well boiled; and in some cases milk-gruel might be substituted with advantage. For a *diuretic* clyster, in cases of strangury, or obstructions of the feminary passages, he recommends 1 oz. of castile soap dissolved in two quarts of warm water, and the addition of 2 oz. of Venice turpentine, previously beaten up with the yolks of two eggs.

COACHES, HACKNEY, col. 4, line 8 from bottom, add—By statute 55 Geo. III. c. 159. s. 2. the commissioners are empowered to license hackney chariots: and by an act passed July 11, 1817, the holders of licences may drive either a coach or a chariot under the same licence; provided that they do not at the same time drive more than one, which is to be expressed in the licence, under a penalty of 10*l.* or revocation of the licence.

COAL, col. 13, l. 3 from bottom, for 2 92 Grey, &c. r. 21 92 Grey, &c. Col. 20, l. 12, for easterly r. westerly.

COALBROOK, or COLEBROOK DALE, in *Geography*, a township of Berks county, in Pennsylvania, containing 792 inhabitants.

COBALT, col. 7, l. 6 from bottom, for or r. on.

COBALT, in *Chemistry*, the name of a metal. Some circumstances omitted in their proper place require to be mentioned here.

The specific gravity of pure cobalt, according to Tassaert, is 8.5384; according to Lampadius it is 8.7. It melts at about 130° of Wedgwood's scale, and is not capable of being volatilized by any degree of heat we can excite. Like iron, it is attracted by the magnet, and according to Wenzel is capable of being converted into a magnet, precisely similar in its properties to the common magnetic needle.

There are two oxyds of cobalt, the protoxyd or *blue*, and the peroxyd or *black oxyd*.

The protoxyd dissolves in acids without effervescence, and seems to form the basis of most of the salts of cobalt. According to Rothoff, it is composed of

Cobalt	-	-	-	100
Oxygen	-	-	-	27.36

Proust found the proportion of oxygen considerably less, that is to say, only 19.8 with 100 of the metal; and Klaproth still less, or about 18.0. If, with Dr. Thomson, we

consider Rothoff's analysis most entitled to confidence, the weight of the atom of cobalt will be 36.25.

When the protoxyd of cobalt, newly precipitated from an acid, is dried by heating it in the open air, it assumes a flea-brown colour, which gradually deepens till it becomes black. This is the peroxyd of cobalt. It dissolves with effervescence in muriatic acid, and a great quantity of chlorine is evolved. From the experiments of Rothoff, it appears that this oxyd is composed of

Cobalt	-	-	-	100
Oxygen	-	-	-	36.77

Hence it appears to be composed of two atoms cobalt, and three of oxygen; and on this supposition, the weight of its atom will be 102.5.

COCALICO. Add—containing 4024 inhabitants.

COCAMITE. r. fec MAYNAS.

COCCINELLA, l. 39, add—These insects are commonly known under the name of lady-birds. The *C. 7-punctata*, or that of a 7-spotted body, makes its appearance in the advanced state of spring and middle of summer, and in every field and garden. One of the most beautiful of the English species is *C. 18-punctata* of Linnæus, which is little more than half the size of the common red bead, and is of a bright yellow colour, with numerous (generally 18) black specks.

COCCIUM, l. 4, r. Ribchester.

COCOLITE. See MINERALOGY, *Addenda*.

COCHIN-CHINA, col. 8, l. 11 from bottom, for winged r. wing. Col. 10, l. 12, for men r. women.

COCKBURNE, l. 2, for Grafton r. Coos. Add—It contains 142 inhabitants.

COCKE, a county of East Tennessee, containing 5154 inhabitants, of whom 436 are slaves.

COCKERMOUTH, l. 40, r. 2964; l. 41, r. 602.

CODORUS. Add—It contains 1975 inhabitants.

COELACHNE, in *Botany*, from *κοιλος*, empty, and *αχος*, a husk, alluding to the inflated glumes.—Brown *Prodr. Nat. Holl. v. 1*. 187.—Clas and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Eff. Ch. Calyx of two nearly equal, very blunt, tumid valves, two-flowered. Florets of two valves, without awns; the uppermost stalked, female. Nectary of two scales. Stigmas feathery. Seed unconnected, cylindrical, acute at each end.

1. *C. patchella*. Found by sir J. Banks, in the tropical part of New Holland. A little smooth slender *grass*, resembling a diminutive *Brisa*, very remarkable for the smaller, or imperfect, *stret* being female, not male.

COFFEE, col. 13, l. 1, r. 49, and 98; l. 15, r. 100. Col. 14, l. 29, r. 43.

COHASSET, l. 3, r. 994.

COINAGE, col. 2, l. 4 from bottom, *Plate III. fig. 1. Miscellany*.

COIT'S GORE, in *Geography*, a town of Franklin county, in Vermont, having 193 inhabitants.

COITSVILLE, a township of Ohio, in the county of Trumbull, having 429 inhabitants.

COKE, Sir EDWARD, l. 3, r. Micham.

COLBERT, JOHN BAPTIST, l. 16, r. XIV.

COLCHESTER. In 1811, the borough of Colchester contained 2111 houses, and 12,544 persons; 5400 being males, and 7144 females: 480 families employed in agriculture, and 1152 in trade and manufactures.

COLCHESTER, in America, l. 7, add—containing, in 1810, 2697

2697 inhabitants, of whom 7 are slaves; l. 10, add—containing 657 inhabitants.

COLCHICUM, col. 2, add—See Phil. Transf. for 1817, pt. ii. p. 262; and for MEADOW *r.* SAFFRON.

COLDINGHAM. In 1811 the parish contained 462 houses, and 2424 persons; 1174 being males, and 1250 females.

COLDSTREAM. In 1811, the parish contained 397 houses, and 2384 persons; 1103 being males, and 1281 females.

COLEBROOK, l. 2, for Grafton *r.* Coos; l. 6, add—containing, in 1810, 325 inhabitants; l. 10, add—In 1810, it contained 1243 inhabitants.

COLEBROOKEA, in *Botany*, so named, by the writer of this, in honour of Henry Thomas Colebrooke, esq., chief judge in the courts for the natives of Bengal, a practical and accomplished botanist.—Sm. Exot. Bot. v. 2. 111.—Class and order, *Didymia Gymnospermia*. Nat. Ord. *Vitices*, Juss.

Eff. Ch. Calyx-teeth five, becoming feathery awns. Seed solitary, bristly. Limb of the corolla unequally five-lobed.

1. *C. oppositifolia*. Opposite-leaved Colebrookea. Sm. as above, t. 115.—Leaves opposite.—Found by Dr. Buchanan, by road sides in Nepal. A downy, slightly aromatic, shrub, with stalked, elliptic-lanceolate, ferrated leaves, and terminal, aggregate, whorled spikes, of innumerable minute white flowers.

2. *C. ternifolia*. Three-leaved Colebrookea. Roxb. Corom. v. 3. 40. t. 245.—Leaves three or four in a whorl.—Native of Myfore. The leaves are narrower and more drooping; the spikes much smaller than in the foregoing. Dr. Roxburgh says the germs are four, sometimes all perfected; the flowers aggregate, with many common bracteas.

COLEFORD. In 1811, this tithing in Newland parish contained 253 houses, and 1551 persons; 849 being males, and 702 females.

COLERAIN, l. 2, add—containing 834 inhabitants; l. 20, add—Also, a township of Bedford county, in Pennsylvania, containing 1847 inhabitants.—Also, a township of Belmont county, in Pennsylvania, containing 471 inhabitants.—Also, a town of Ross county, in Ohio, having 846 inhabitants.

COLERAINE, l. 3, *r.* and in 1810, 2016 inhabitants.

COLESHILL. In 1811, this parish contained 330 houses, and 1639 persons; viz. 789 males, and 850 females; 119 being employed in agriculture, and 196 in trade and manufactures.

COLICA, or **COLIC**, in *Farristry*, a disease to which brute animals are subject; for which Mr. Taplin recommends a ball made of the following ingredients; viz. 1 oz. of pulverized aniseeds; $\frac{1}{2}$ oz. of mithridate; ginger and grains of paradise, of each, in powder, 2 drs.; oil of aniseed and oil of juniper, of each, 1 dr.; and syrup *q. s.*: the ball to be given, according to the state of the disease, every two, four, or six hours. In some cases, a mixture of ginger, pepper, aniseeds, &c. $\frac{1}{2}$ oz. of each, with the addition of a little brandy or gin, will give relief. In flatulent colics, a ball made of 6 drs. or 1 oz. of Venice turpentine, purified opium from 1 to $1\frac{1}{2}$ dr., 1 dr. of oil of aniseeds, and 2 drs. of powdered ginger, may be administered every two, three, or four hours, according to the urgency of the symptoms.

COLLEMA, in *Botany*, $\kappa\omicron\lambda\lambda\gamma\mu\alpha\varsigma$, a glutinous substance. The name appears to have originated with Hill, and is adopted by Hoffmann and Acharius. The latter has only admitted this genus in his two last publications.—Ach. Lichenogr. 129. t. 14. f. 8—11. Syn. 308. Sm. in Engl.

Bot. 2284. (Parmelia, sect. 6; Ach. Meth. 221.)—Class and order, *Cryptogamia Algae*. Nat. Ord. *Lichenes*.

Eff. Ch. Shields orbicular, horizontal, nearly sessile, superficial, with a gelatinous accessory border.

Acharius reckons up sixty-four species. These are the gelatinous Lichens of former authors. (See *LICHENES*, sect. 1.) They are all more or less pulpy, olive-green, or blackish; their fronds various in form and direction. Twenty-three British species are figured in Engl. Bot.

COLLEMORE'S RIDGE, in *Geography*, a township of America, in the district of Maine, and county of Lincoln, having 40 inhabitants.

COLLETON, a district of South Carolina, containing 26,359 inhabitants, of whom 5238 are slaves.

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COLLISION, col. 9, three last lines, for *Z. r. E.*

COLNE. By the return of 1811, this township contained 990 houses, and 5336 persons; viz. 2531 males, and 2805 females: 58 families being employed in agriculture, and 928 in trade and manufactures.

COLONSAY, l. 21, By the last act 786, and the number of houses 138.

COLOUR, col. 12, l. 11, for cold *r.* colour. Col. 22, l. 18, for tube *r.* tub.

COLOURING Principle of the Blood, Chemical Properties of. See BLOOD.

COLUBER, l. ult. *r.* See HYDRUS.

COLUGO, in *Zoology*. See GALEOPITHECUS.

COLUMB, St. In 1811, the parish of St. Columb major contained 410 houses, and 2070 persons; viz. 988 males, and 1082 females: 225 being employed in agriculture, and 108 in trade, &c.: and the parish of St. Columb minor contained 229 houses, and 1126 persons; viz. 550 males, and 576 females: 147 families being employed in agriculture, and 72 in trade, &c.

COLUMBA, a military order, l. 2, *r.* 1379. Add—See DOVE.

COLUMBIA, l. ult. *r.* in 1810, 32,390 inhabitants, of whom 879 are slaves; l. 8, add—It contains 11,242 inhabitants, including 5980 slaves; l. 11, add—It contains 518 inhabitants; l. 31, add—It contains 2057 inhabitants.—Also, a township of Cayuhaga, in Ohio, having 205 inhabitants.

COLUMBIANA. Add—It contains 17 townships, and 10,878 inhabitants.—Also, a town of Kentucky, in Adair county, containing 175 inhabitants, of whom 45 are slaves.—Also, a district of America, containing 24,023 inhabitants, of whom 5395 are slaves.

COLUMBIUM, *Columbic Acid*, in *Chemistry*. See TANTALUM.

COLUMBO, l. 6, *r.* Trincomalee.

COLUMBUS, in *Geography*, a county of North Carolina, containing 3022 inhabitants, of whom 703 are slaves.

COLUMNA, l. 10, for elliptic *r.* epileptic.

COLYTON, l. penult. *dele arms*; l. ult. *r.* 343 and 1774.

COMBINATION, col. 2, l. 8, *dele cc*; l. 38, for $\frac{6-1}{2} r. \frac{6-1}{3}$.

COMBUSTION, *Theory of*, in *Chemistry*. See ACID, and ACIDIFICATION.

COMEPHORUS, in *Ichthyology*, a genus of the apodes, the

the characters of which are, head large, with depressed snout; mouth large, with small teeth; body elongated, compressed, the second dorsal fin surrounded with several long naked rays.

This fish is a genus of Cepede, and referred by Pallas to the genus of callionymus among the jugular fishes. It is a native of the lake Baikal; and from its conformation seems to be capable of swimming swiftly, and of springing out of the water like the flying-fish. See *CALLIONYMUS Baikalensis* of Gmelin's Linnæan system.

COMMIPHORA, in *Botany*, from *καμμη*, gum, and *φορος*, to bear, Jacq. Hort. Schoenbr. v. 2. 66. t. 249, a dioecious octandrous shrub, of which the male only is known, found in Madagascar, and said to produce that kind of elastic gum, of which Fourcroy has given an analysis. More information on this subject is very desirable.

COMMON PRAYER, l. 15, add—2 & 3 Edw. VI.

COMPAGNIE ECOSSEOISE. See GENDARMES, &c.

COMPASS, col. 6, l. 37 and 38, *r.* See MAGNETICAL DECLINATION, and MAGNETICAL VARIATION.

COMPENSATION, col. 18, l. 30 from the bottom, for but broader *r.* and narrower.

COMPOSTELLA, l. 2, after capital, insert—(see *CORUNNA*).

COMPOUNDS, in *Chemistry*, are divided into *primary* and *secondary*.

Primary compounds, according to Dr. Thomson, are those formed by the union of combustibles with the four supporters of combustion, oxygen, chlorine, iodine, and fluorine, and with *cyanogen*. Dr. Thomson also includes under this division certain compounds of combustibles with one another, and with oxygen.

Secondary compounds are those formed by the union of two or more primary compounds. These include the four classes of substances, termed hydrates, salts, hydrofulphurets, and soaps.

COMREE, in *Geography*, a township of Berks county, in Pennsylvania, containing 2017 inhabitants.

CONCORD, l. 10, insert—and had, in 1810, 2396. At the close, add—Also, a town of Grafton county, in New Hampshire, containing 1126 inhabitants. At the close of the next article, add—containing 677 inhabitants; l. 4 from the bottom, after upwards, add—By the census of 1810, the number of inhabitants was 1633.

CONCORD, in Delaware county, add—containing 1061 inhabitants.—Also, a township of Miami county, in Ohio, having 679 inhabitants.—Also, a town of Ross county, in Ohio, containing 1277 inhabitants.

CONCORDIA. Add—Also, a county and parish of the territory of Orleans, containing 2895 inhabitants, of whom 1581 are slaves.

CONEMAUGH, a township of Indiana county, in Pennsylvania, containing 1167 inhabitants.—Also, a township of Somerset county, in the same state, having 381 inhabitants.

CONESTOGA. Add—containing 1506 inhabitants.

CONEWAGO, a township of Adams county, in Pennsylvania, having 531 inhabitants.

CONEWANGO, a township of Warren county, in Pennsylvania, having 448 inhabitants.

CONGLETON, 2 last lines, *r.* at 944, the inhabitants at 4616, of whom 2023 are males, and 2593 females.

CONGOON, a port of Laristan, in Persia, containing 6000 or 7000 inhabitants, and having an excellent roadstead, where a frigate may ride safely in the most tempestuous weather, and good water and fire-wood be procured.

CONIC SECTIONS, *Lemmas*. Def. l. 1, *r.* A E; l. 2, D and B; l. 3, A B. Cor. l. 1, *r.* A E in B; l. 3, B and D and in B; l. 5, D B and D E.

CONNECTICUT. At the close, add—See UNITED STATES.

CONNELSVILLE, l. 2, for Washington *r.* Fayette; l. 4, *r.* 93 inhabitants.

CONNIOTT, a township of Pennsylvania, in the county of Crawford, having 285 inhabitants.

CONON, l. 1, for son *r.* father; l. 2, after Athens, *r.* who died in the year B.C. 393.

CONOPLEA, in *Botany*, Perf. Syn. Fung. 234, an obscure genus of *Fungi*, consisting of compact, rigid, permanent fibres, generally black or brownish, interperled with powder. Four species are described, found on rotten wood, branches, or leaves.

CONOSTYLIS, from the conical form of the style.—Br. Prodr. Nov. Holl. v. 1. 300. Pursh 224.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Hemodoraceæ*, Brown.

Eff. Ch. Corolla superior, in six deep equal segments, woolly with branched hairs, permanent. Anthers erect. Style conical, separable into three parts. Stigma simple. Capsule of three cells, bursting at the top, with a triangular central receptacle, and many seeds.

Roots perennial, fibrous. *Stem* scarcely any. *Leaves* sword-shaped, equitant, rough or bristly at the edges. *Stalk* many-flowered, capitate or corymbose, often woolly.

Four species are natives of the fourth coast of New Holland; and one, *C. americana*, of the pine-barens of New Jersey and Carolina, bearing flowers of a golden yellow, in July. The *germen* is almost entirely superior in this species. *Pursh*.

CONSTRUCTION of Boats. The plate referred to under this article has been superseded by Plate XIV. of *Naval Architecture*; and for the description of the latter, as far as it relates to **BOATS**, the reader is referred to the article **WHOLE-Moulding**.

CONVOCACTION, col. 3, l. 36, after representatives, add—The summons to the convocation must not be confounded with that which we now mention, though the constituent parts are the same; and by modern usage the assembly of both is supposed to have been on the same day. But the one may be easily distinguished from the other by this difference; *viz.* that the convocation is provincial, and summoned by the metropolitans of Canterbury and York; whence the clause, commonly denominated *præmunientes*, (from its first word,) in the writ to each bishop proceeds from the crown, and enjoins the attendance of the clergy at the national council of parliament.

CONWAY, col. 3, at the close—Population in 1811 was 1053; the number of houses 218.

CONWAY, in America, l. 8, *r.* 1080. Col. 4, l. 1, *r.* 1784.

COOLING Powers of the Gases. It is difficult to ascertain the precise conducting powers of gaseous substances, as the cooling of hot bodies in gases is influenced by a variety of circumstances besides their conducting properties. Count Rumford found, that a thermometer cooled nearly four times as fast in water as in air of the same temperature. The same philosopher also found, that rarefaction much diminishes the conducting power of air, and that hot bodies cool slowest of all in a Torricellian vacuum. This subject, however, has been investigated more lately with greater precision by Leslie and Dalton. Mr. Leslie ascertained, that the conducting power of all gases is diminished by rarefaction. He has endeavoured to deduce from his experiments,

ments, that the conducting power of air is nearly proportional to the fifth root of its density. Mr. Dalton, however, has rendered it probable, that it varies nearly as the cube root of its density. Vapours of all kinds, and every thing that has a tendency to dilate air, diminish their conducting powers. The conducting powers of common air, oxygen, and azote, as might be expected, are nearly equal. The conducting power of carbonic acid is rather inferior to that of air, but bodies cool in hydrogen more than twice as fast as in common air; and Mr. Leslie has endeavoured to shew, that the actual conducting power of hydrogen is no less than four times greater than that of common air.

Mr. Dalton's experiments were made with a strong phial filled with the gas to be examined, into which he introduced a delicate thermometer through a perforated cube, and observed the time it took to cool 15° or 20°. The following table exhibits the result of his experiments:

	Time of cooling.
Carbonic acid	112''
Sulphuretted hydrogen	} - - - 100'' +
Nitrous oxyd	
Olefiant gas	
Common air	
Oxygen	100''
Azote	} - - - 90''
Nitrous gas	
Gas from pit-coal	
Hydrogen gas	40''

COOLSPRING, in *Geography*, a township of Pennsylvania, in the county of Mercer, having 521 inhabitants.

COOS, in *Ancient Geography*. Add—See COS.

Coos, in *Geography*. Add—Coos is a county of New Hampshire, containing 24 townships, and 3991 inhabitants.

COPAL. Add—See VATERIA.

COPPER, in *Chemistry*, the name of a metal. Some circumstances omitted in our account of this metal require to be inserted here.

There are two oxyds of copper, the protoxyd of an orange or red colour, and the peroxyd or black oxyd.

The protoxyd was observed by Proust; but Chenevix, who found it native in Cornwall, first accurately described its properties. It may be formed by mixing together 57.5 parts of black oxyd of copper, and 50 parts of copper in a state of powder, formed by precipitating it from muriatic acid by an iron plate. This mixture is to be triturated in a mortar, and put with muriatic acid into a well-stopped phial. Potash dropped into this solution precipitates the oxyd of copper of an orange colour. It may be also formed with much less trouble by adding excess of copper to muriatic acid, and letting the whole remain till the green colour disappears, and the solution becomes dark brown and opaque. In this state, dirty-white crystals like sand are deposited. If potash be added to the brown solution, or a solution of the crystals above-mentioned, the protoxyd is precipitated in abundance. According to Berzelius, this oxyd is composed of

Copper	-	100
Oxygen	-	12.5

Hence the weight of the atom of copper will be 80.

The peroxyd or black oxyd of copper has been already described. It is composed, according to Proust and Berzelius, of

Copper	-	100
Oxygen	-	25

Hence the quantity of oxygen in these two oxyds is as one to two; or the protoxyd may be considered as composed of one atom copper and one of oxygen, and the peroxyd of one atom copper and two of oxygen. From these determinations, the composition and weights of the atoms of the different salts of copper may be accurately estimated.

COPTIS, in *Botany*, from *κῶπις*, to divide.—Salisb. Tr. of Linn. Soc. v. 8. 305. De Cand. Syst. v. 1. 321. Pursh. 390.—Class and order, *Polyandria Polypetala*. Nat. Ord. *Ranunculaceae*, Juss.

Eff. Ch. Calyx none. Petals five or six, deciduous. Nectaries as many, hooded. Follicles membranous, stalked, beaked, with many seeds.

1. *C. trifolia*.—Three-leaved Coptis. Pursh n. 1.—Leaves ternate, obovate. See HELLEBORUS, n. 3.

2. *C. asplenifolia*. Fern-leaved Coptis. Pursh n. 2.—Leaves twice ternate, pinnatifid.—Found by Mr. Menzies, on the west coast of North America, and by Thunberg in Japan, this being actually *Thalictrum japonicum* of that author, and of Willd. Sp. Pl. v. 2. 1303! The flowers are greenish.

CORACHIE, in *Geography*, a good sea-port in the country of *Scind*; which see.

CORAL, *Chemical Properties of*. See VERMES.

CORALLORRHIZA, in *Botany*, an old name, alluding to the branching coral-like form of the root.—Hall. Hist. v. 2. 159. t. 44. Brown in Ait. Hort. Kew. v. 5. 209. See CYMBIDIUM.

Eff. Ch. Lip elongated into a spur at the base. Column unconnected. Anther a terminal deciduous lid. Masses of pollen four, oblique.

We do not doubt the propriety of separating this plant, and another of American origin, (see Pursh 593, n. 4.) from *Cymbidium*; but we have some nearly allied *Orchideae* from Nepal, which require to be examined before the limits of *Corallorrhiza* can be clearly defined.

COROLLERAS. Add—The great body of the Cordilleras, as it extends from Quito northward, approaching the gulf of Mexico, and entering the kingdom of New Granada, is divided into three chains, which are almost parallel, and of which the two lateral branches are covered with sand-stone, and other secondary formations, to a very considerable height. The eastern chain divides the valley of the river Magdalena from the great plains that are drained by the Orinoco and its branches. Inclosed by a circle of mountains belonging to this chain is the high valley of Bogota, the bottom of which is no less than 7460 feet above the level of the sea. The waters of this valley are collected by the single stream of Rio de Bogota, which finds its way through the mountains to the S.W. of the town of Santa Fé; the stream where it leaves the valley is about 144 feet wide; it then enters into a rocky channel not more than 40 feet wide, apparently formed, says M. Humboldt, by an earthquake. From this crevice, the river precipitates itself at two bounds to the depth of 574 feet; and after this fall pursues its course to the Magdalena, about 50 miles, still descending with great rapidity, and at the rate of 150 feet to a mile. The natural bridges of Iaconzo are on the western declivity of this ridge. The central chain is the highest of the three, and often attains the limits of perpetual snow, and greatly surpasses it in the colossal summits of Guanneas, Baragan, and Quindiu. The western chain separates the valley of Cauca from the province of Choco, and the coasts of the South sea. This is lower than the others, and rises so much as it approaches the isthmus of Panama, that its course can hardly be ascertained. In our ordinary

ordinary maps, there is no trace of the highest or central chain; and Mr. Arrowsmith's map of America, in 1802, makes the valley of Magdalena occupy the whole interval between the eastern and western chains. The most difficult passage of the Andes is that by the mountain Quindiu. It lies through a thick uninhabited forest, which cannot be traversed, in the finest season, in less than ten or twelve days. The summit of the pass is at the prodigious height of 11,499 feet above the level of the sea, and the passage from ten to sixteen inches in breadth. Humboldt's Researches, &c. by H. M. Williams, 1814.

CORDYLINE, in *Botany*, an old name of Van Royen's, from *κordύλη*, a club or staff; suitable enough to the *Dracena* and *Yucca* to which it was originally applied, and which we presume are included in the genus which now bears it.—Commerf. in Juss. 41. Brown Prodr. Nov. Holl. v. 1. 280.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Asparagi*, Juss. *Alphodelea*, Br.

Eff. Ch. Corolla bell-shaped, in six equal segments, deciduous. Filaments inserted into the throat, awl-shaped, smooth. Anthers versatile, cloven at the base. Stigma three-lobed. Berry globular, of three cells, with several seeds, whose scar is bordered. *Br.*

The stem is shrubby. *Leaves* lanceolate, finely ribbed, elongated. *Panicle* terminal, of numerous, many-flowered, alternate spikes, with two unequal bractees under each flower.

1. *C. canniifolia*. Br. n. 1.—Leaves stalked, pointed. Clusters divided. Outer bractees acute, twice as large as the inner, which hardly equal the partial stalks.—Found by Mr. Brown, in the tropical part of New Holland.

See *DRACENA*, of which our first and second species belong to this genus.

CORFE-CASTLE, l. 29, *r.* after return—of 1811 was 161, and of inhabitants 744.

CORINTH, a township of America, l. 2, *r.* 1876.

CORINTHIAN ORDER, l. 8, for convex *r.* concave.

CORN, col. 3, l. 18 from the bottom, *dele* l. 18 to l. 14.

VOL. X.

CORNEA, *Opacities of*. Opacity of the cornea is one of the worst consequences of obdurate chronic ophthalmia. The slight, recent, and superficial form of the disease is usually known under the name of nebula; and it is preceded by and attended with chronic ophthalmia. The iris and pupil are discernible through a sort of cloudiness, and the patient is not entirely deprived of the power of vision. The veins of the conjunctiva are greatly relaxed, turgid, irregular, and knotty, which change first affects their trunks, and then gradually extends to their ramifications near the union of the cornea with the sclerotics, and ultimately to their most minute branches returning from the delicate layer of the conjunctiva, spread over the front of the cornea. When this happens, a milky albuminous secretion begins to be superficially effused in the interspaces between the red streaks, and the specks thus produced may cover only a part or the whole of the cornea.

The opacity of the cornea sometimes occurring in violent ophthalmies is essentially different from the nebula, and arises from a deep extravasation of coagulating lymph in the cellular texture of the cornea, or from an abscess between its layers. In the treatment of the nebula, the curative indications are to restore the varicose vessels to their natural diameters; and if that be impracticable, to

cut off all communication between the trunks of the most prominent veins of the conjunctiva and those on the cornea. The first object is performed by using Janin's ophthalmic ointment, or the ung. hydrarg. nitrati, together with astringent collyria. The second desideratum is fulfilled by the excision of the fasciculus of varicose veins, just at the base of the opacity, with a pair of dissecting scissors and forceps. With respect to the deeper and more obdurate opacities, which are frequently called *albugo* and *leucoma*, they are consequences of severe acute ophthalmia, though sometimes the effects of an ulcer or wound of the cornea, when they are commonly known only by the latter appellation.

The recent *albugo* may sometimes be dispersed by the same treatment, which is applicable to violent ophthalmia; and when the inflammation has been subdued, the ung. hydrarg. nitrati. is the best local remedy for promoting the absorption of the extravasated opaque lymph. The eye may also be frequently washed with a collyrium, composed of two scruples of the muriate of ammonia, and four grains of verdigrise, in eight ounces of lime-water. The treatment must be continued three or four months before the case is to be abandoned as hopeless. With respect to the *leucoma* arising from a cicatrix, Scarpa sets it down as absolutely incurable.

CORNISH, l. 5, *r.* 1810, and 1606. Add—Also, a town of York county, in the district of Maine, having 974 inhabitants.

CORNVILLE, a town of America, in the district of Maine, and county of Somerset, having 504 inhabitants.

CORNWALL, col. 8, l. 31, *r.* 1811; l. 32, *r.* 37, 973, and 216, 667.

CORNWALL, in America, l. 3, *r.* 1279; l. 8, add—containing 1602 inhabitants.

CORO, l. 7, after persons, add—The little commerce that is carried on is in mules, goats, hides, sheep-skins, cheese, &c. obtained from the interior of the country, and more particularly from Carora. At the close, *r.* N. lat. 10° 8' from Paris.

CORSHAM, l. 17, add—By the return of 1811, the number of houses was 478, and that of inhabitants 2395.

CORTLANDTS, a county of New York, having 8800 inhabitants.

CORUNDUM. See *MINERALOGY*, *Addenda*, and *ADAMANTINE Spar.*

CORUNNA. Add—See *COMPOSTELLA*.

CORVUS, col. 2, l. 20, add—The African or Cape raven, described by Le Vaillant, is, according to Dr. Shaw, the only variety worthy of notice.

CORWEN, l. ult. *r.* 51 Geo. III. 288 houses, and 1417 inhabitants.

CORYSANTHES, in *Botany*, from *κoryς*, a helmet, and *ανθος*, a flower.—Brown Prodr. Nov. Holl. v. 1. 328.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideae*.

Eff. Ch. Calyx ringent; upper lip vaulted, very large; lower in two linear segments, combined with the linear petals. Lip dilated, concave. Anther terminal, of one cell, and two connected valves, permanent. Masses of pollen four. Curious little smooth plants, each with a single bulb, one roundish radical leaf, and a large, deep red, solitary flower. Nearly related to *LYPERANTHUS nigricans*; see that article.

1. *C. fimbriata*. Fringed Helmet-orchis. Br. Terr. Auotr. 78. t. 10.—Lip without a spur, hooded, fringed.—In shady places, under rocks, at Port Jackson. *Br.* Hardly two inches high, its beautiful purple variegated flower subtended

subtended by an almost orbicular, heart-shaped, pointed leaf.

2. *C. unguiculata*. Stalked Helmet-orchis. Br. n. 2.—Lip without a spur, tubular, dilated and oblique. Hood stalked. Flower pendulous.—Found by Mr. Bauer, at Port Jackson.

3. *C. bicarata*. Double-spurred Helmet-orchis. Br. n. 3. (Corybas aconitiflorus; Salis. Parad. t. 83.)—Lip tubular, with two spurs at the base.—Found near Port Jackson, but, according to Mr. Brown, very rarely, nor does he seem to think it has ever been brought alive to England. We received a specimen in spirits, from Dr. White, about the year 1793; Mr. Brown's remarks on this subject are curious.

COSMEA, a name certainly much improved from *Cosmos* of Cavanilles, Ic. v. 1. 9.—Ait. Hort. Kew. v. 5. 132.—This genus comes next to *Corcepsis*, and we should scarcely scruple to unite them.

COSMELIA, from κοσμος, to adorn, alluding to its beauty.—Br. Prodr. Nov. Holl. v. 1. 553.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Epparideæ*, Brown.

Ess. Ch. Calyx leafy. Corolla tubular, bearing the stamens. Anthers united lengthwise to the fringed tops of the filaments. Nectary of five scales. Capsule with a central receptacle.

1. *C. rubra*. Found by Mr. Brown, in bogs on the south coast of New Holland. An upright *strub*, without scars on the denudated branches. Leaves sheathing at the base. Flowers terminal, bright red, drooping. Calyx accompanied by imbricated leafy bracts. Br.

Nearly akin to *ANDERSONIA*; see that article.

COTAISIS. Add—This town, called Cotaïs or Cotatis, is now an inconsiderable place, inhabited by about 80 Jewish, Armenian, and Turkish families. Its rivers are extensive, and it is situated on a beautiful and fertile plain.

COTCHUNG. See DERAGUZ.

COTENTIN for CONTENTIN.

COTOPAXI. This is the loftiest of those volcanoes of the Andes, which in recent epochs have undergone eruptions. Its absolute height, according to Humboldt, is 18,874 feet; so that it is double that of Canigou, and 2600 feet higher than Vesuvius would be if it were placed on the top of the peak of Teneriffe. This is also the most dreadful volcano of the kingdom of Quito, and its explosions are the most frequent and disastrous. The mass of scoriz, and the huge fragments of rock thrown out of this volcano, cover a surface of several square leagues; and would form, if they were heaped together, a colossal mountain. In 1758, the flames rose 2900 feet above the brink of the crater. In 1744, the roaring of the volcano was heard on the borders of the Magdalena, a distance of 200 leagues. In April 1768, the quantity of ashes ejected by the volcano was so great, that in the towns of Haunbato and Tacuaga the inhabitants were obliged to use lanterns in walking the streets at noon-day. The explosion in January 1803 was preceded by the sudden melting of the snow which covered the mountain. For twenty years before, no smoke or vapour had been observed to issue from the crater; and in a single night, the subterraneous fire became so active, that at sun-rise the external walls of the cone were heated to such a degree as to appear quite naked, and of the dark colour peculiar to vitrified scoriz. At the port of Guayaquil, fifty-two leagues distant, Messrs. Humboldt and Bonpland heard the noise of the volcano day and night, like the continued discharges of artillery.

In this part of the Andes, a longitudinal valley separates the Cordilleras into two parallel chains; the bottom of this valley is 9843 feet above the level of the ocean, so that Chimborazo and Cotopaxi appear no higher than the Col du Geant, as measured by Sauffure. The summit of the mountain of Chimborazo is 21,430 feet above the level of the sea, and therefore a good part is above the circle of perpetual congelation, which, in the latitude almost under the line, is somewhat higher than the summit of Mont Blanc. Humboldt's Researches. See VOLCANO.

COTTAGE, col. 13, l. 15 from the bottom, for feed r. reed.

COVENTRY. By the return in 1811, this city contained 3448 houses, and 17,293 persons; viz. 8197 males, and 9726 females: 123 families being employed in agriculture, and 3207 in trade, manufactures, and handicraft.

COVENTRY, in America, l. 4, add—containing 1938 inhabitants; l. 6, r. 2928; l. 8, r. 162; l. 12, add—In 1810 it contained 178 persons; l. 13, r. having 1608 inhabitants.

COUGHING, in *Physiology*. See LUNGS.

COUNSEL, col. 2, l. 5, r. the king's premier, &c.

COURONNE des Taffes, an apparatus constructed by professor Volta, in which he arranges the component parts of the galvanic pile in a different form. (See GALVANISM.) This apparatus consists of a set of small glasses, placed sideways of one another, and containing water or some saline solution. Metallic arcs are then procured, having one end composed of zinc, and the other of silver or copper: these arcs are inserted into the glasses in an uniform order; each glass having the zinc leg of one arc, and the copper or silver leg of another arc immersed in the fluid. The zinc and copper legs are not in contact, and they are always to be disposed in the same situation with respect to each other; i. e. one is always to be at the right-hand, and the other at the left. The pile and this apparatus operate in the same manner, and their operation is referred by the professor to his new principle (see VOLTAISM), by which he conceived different metals, when placed in contact, to destroy the electric equilibrium, or, in his phrase, to become movers of electricity, producing that electric motion which is supposed to be the primary and essential cause of the galvanic action.

COURT, *University*, col. 2, l. 4, r. 14th.

COURUPITA for COURAPITA.

COWBRIDGE. In 1811, the parish contained 158 houses, and 850 persons; 425 being males, and 425 females.

COW-TAIL RIVER. See WAU-CA-HATCHO.

CRACKS, col. 4, l. 15, for bone r. cone.

CRAFTSBURY, in *Geography*, a town of Orleans county, in the state of Vermont.

CRAIL. In 1811, the burgh and parish of Crail contained 316 houses, and 1600 persons; viz. 673 being males, and 927 females.

CRANBERRY. Add—Also, a town of Butler county, in Pennsylvania, having 543 inhabitants.

CRANBORNE. In 1811, the parish of Cranborne contained 144 houses, and 816 persons; viz. 429 being males, and 387 females.

CRANBROOK. Add—The parish of Cranbrook, by the returns of 1811, has 511 houses, and 2994 persons.

CRAVEN, l. 4 and 5, r. 12,676, and 5050.

CRAWFORD, a county of Pennsylvania, containing fourteen townships, and 6178 inhabitants.

CRAYFORD. In 1811, the parish contained 233 houses, and 1553 persons; viz. 769 being males, and 784 females.

CREAM,

CREAM, *Chemical Analysis of*. See MILK.

CREDITON, l. 8 from the end, *r.* and the hundred contains, by the return of 1811, 2130 houses, and 10,648 inhabitants; l. 5, after extent, add—But the borough of Crediton contains only 425 houses, and 1846 inhabitants.

CREWKERNE, col. 2, l. 4, for 41 *r.* 51; l. 5, *r.* of houses was 589, and of persons 3021, of whom 1346 are males, and 1675 females; 281 families employed in agriculture, and 308 in trade, &c.

CRIBRARIA, in *Botany*, from its perforated structure, Perf. Syn. Fung. 189; one of those beautiful, though minute, genera of *Fungi*, whose head is formed of reticulated fibres, enclosing the powdery seeds. Perfoon reckons up eleven species.

CRICKHOWEL. In 1811, the parish contained 137 houses, and 611 inhabitants. In the hundred of Crickhowel is a Roman encampment, called the Gaer, situated at the extremity of the vale, on a rising ground. The dimensions are much the same with those of Caer-Bannau (see BANNIUM), and it is nearly of a square form. It lies on the Via Julia, which passed in this direction from Caerleon to Caermarthen. We are informed that the old practice of singing carols in the church at cock-crow, or the earliest dawn of the morning, on Christmas-day, is still continued in the church at Crickhowel; but it merits any other appellation than that of a religious rite.

CRICKLADE, l. 14, *r.* 51; l. 15, *r.* 1939, and 2095; l. 16, 10,403; l. 17, 4894, and 5509; 1483 families chiefly, &c.; l. 18, *r.* 411.

CRISTARIA, in *Botany*, from the wings or crests of the aggregate capules, by which alone it is distinguished from SIDA (see that article).—Cavan. Ic. v. 5. 10. Pursh 453. Sims in Curt. Mag. 1673.—We can hardly assent to the establishment of this genus, its character being entirely artificial, and unaccompanied by any thing discriminative in the habit. The only species mentioned are, 1. *C. glaucophylla*, Cavan. Ic. t. 418. 2. *C. multifida*, which is our SIDA *pterosperrma*, the last species but one in that article. 3. *C. coccinea*, Pursh n. 1. Curt. Mag. t. 1673, a native of the dry plains of the Missouri, perennial and hardy in our gardens, adorned with beautiful scarlet flowers. 4. *C. betonicifolia*, Cav. as above, 11, which is *Malacoides betonicae folio*, &c. Feuille Voy. v. 3. 40. t. 27.

CROMER. At the clofe, add—the parish contains, by the returns of 1811, 170 houses, and 848 inhabitants.

CROSBY, a township of Hamilton county, in Ohio, having 981 inhabitants.

CROSS-CREEK. Add—containing 1847 inhabitants.—Also, a township of Ohio, in Jefferson county, having 1152 inhabitants.

CROSS-WORT. Add—and VALENTIA.

CROTALUS, col. 3, l. 19, *r.* to have them come, &c.

CROTALOPHIS, in *Botany*, from *κρότων*, *Croton*, and *φίσις*, appearance; but the principle of the name is incorrect, inasmuch as the Greek *κρότων* is our *Ricinus*, to which the genus in question bears no resemblance; and if the *Croton* of modern botanists be intended, such a comparative appellation is contrary to rule.—Michaux Boreal-Amer. v. 2. 185. Willd. Sp. Pl. v. 4. 380. Pursh 206.—Clafs and order, *Monoclea Pentandria*. Nat. Ord.?

Eff. Ch. Male, Calyx in five deep segments. Petals five. Female, Cal. and Cor. like the male. Stigmas divided. Capsule superior, not bursting, with one seed.

1. *C. argentea*, Silvery Crotonopsis. Pursh n. 1. (*C. linearis*; Michaux 186. t. 46. Willd. n. 1. *C. elliptica*; Willd. n. 2.)—Native of North America, in sandy ground near the coast, in the Illinois country and on the Missouri,

flowering in July. *Pursh*. A slender annual herb a span high, with opposite or alternate entire leaves, variable in breadth, and loose spikes of minute white flowers. The pubescence consists of fringed silvery scales, as in *Croton*.

CROUPADE, *r.* See BALLOTADE.

CROW'S NEST, in *Naval Language*, is a kind of box, sufficient to hold a man; generally a cask, fixed near the mast-head, to protect the observer from cold, and enable him to look out for whales, or open pieces of water.

CROYDON. The parish of Croydon, in 1811, contained 1394 houses, and 7801 inhabitants; 3616 being males, and 4185 females; 397 families employed in agriculture, and 662 in trade, &c.

CROYDON. Add—and in 1810, 802 inhabitants.

CROYDON Canal, l. 3, *r.* Surry.

CRUCIROSTRA, CROSS-BILL, in *Ornithology*, a genus of birds of the order Passeres; the characters of which are, beak thick and forked; mandibles, when at rest, inversely curved; nostrils small, rounded, situated at the base of the beak; tongue entire. Mr. Stephens, the continuator of Dr. Shaw's Zoology, mentions and describes two species; one of which, or common cross-bill, with a variable red body, quills and tail-feathers brown, beak externally olive-green, and tail forked; the *Loxia curvirostra* of Linnæus; and the cross-bill with a dull crimson body, wings black, with two white fasciæ, secondary quills white at the tips, and tail black, the *Loxia leucoptera* of Gmelin, and white-winged cross-bill of Latham and Pennant.

CRUSTS, *Animal, Chemical Properties of*. See VERMES.

CRYPTHIA, in *Botany*, κρυφία, clandestine, alluding to the concealed corolla.—Br. Prodr. Nov. Holl. v. 1. 508.—A genus, of which there is perhaps but one certain species, a small thyme-leaved herb, with solitary axillary flowers, found on the south coast of New Holland, intermediate between CHILODIA and PROSTANTHERA; see those articles. The ringent corolla is shut up in the closed two-lipped calyx. Possibly the flowers were not fully evolved, owing to the climate or season.

CRYPTOCARYA, Brown Prodr. Nov. Holl. v. 1. 402, a genus of the order of Laurine, resembling the Cinnamon-tree in habit, as well as inflorescence, but differing from *Laurus* in having only two cells in each anther, and from the whole order in having the nut concealed, (whence the name,) in the enlarged tube of the calyx, become closed above it at the top. *C. glaucescens* and *obovata* are natives of Port Jackson; *C. triplinervis* of the tropical part of New Holland.

CRYPTOSTEMMA, κρυπτον, concealed, and στεμμα, a crown, the scaly crown of the seeds being involved in wool.—Brown in Ait. Hort. Kew. v. 5. 141.—Clafs and order, *Syngenesia Polygamia-frustranea*. Nat. Ord. *Compositæ*; Linn. *Gorymbifera*, Juss.

Eff. Ch. Receptacle cellular. Seed-down chaffy, concealed by the entangled wool of the seed. Calyx imbricated. 1. *C. calendulaceum*. Marygold Cryptostemma. Ait. n. 1. (*ARCTOTIS calendulacea*; see that article, sp. 1. Jacq. Hort. Schoenbr. v. 2. 16. t. 157.)—Radiant florets undivided. Leaves pinnatifid, toothed; downy beneath.

2. *C. hypochondriacum*. Divided-rayed Cryptostemma. Ait. n. 2. (*ARCTOTIS hypochondriaca*; see sp. 1, β. Willd. Sp. Pl. v. 3. 2348.)—Radiant florets in three or five deep segments. Leaves lyrate, downy.

3. *C. runcinatum*. Dandelion-leaved Cryptostemma. Ait. n. 3.—Radiant florets in three or five deep segments. Leaves runcinate; toothed; downy beneath.

All the species are natives of the Cape of Good Hope, rather

rather tender annuals in our gardens, of no striking appearance.

CRYPTOSTYLIS, κρυπτός, *concealed*, and ὄστια, *a small pillar*.—Brown Prodr. Nov. Holl. v. 1. 317.—Clafs and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Eff. Ch. Calyx-leaves and petals linear, spreading. Flower reversed. Lip erect, feffile, dilated, undivided; concave at the bafe, concealing the very fhort column. Anther parallel to the ftigma, ftutended at each fide by a lobe of the column.

Bulbs clustered. Leaves few, radical, ftalked, flat. Flowers in a terminal fpike, dull red, feentlefs.

1. *C. longifolia*. (Malaxis fubulata; Labill. Nov. Holl. v. 2. 62. t. 212.) found at Port Jackson, as well as on the fouth coaft;

2. *C. ovata*; and 3. *C. erecta*; are the only defcribed fpecies.

CRYSTAL, col. 5, l. 19, for changed *r*. charged.

CRYSTALLOGRAPHY is the feience which treats of the form and ftucture of cryftals. (See **CRYSTAL**.) The beautiful fymmetrical forms, which frequently occur in the deep recesses of mines or the ftiffures of alpine rocks, cannot fail to ftrike the moft common obferver with furprife. Amidft the almoft infinite variety which they prefent, it will be found, on a more attentive examination, that there are certain definite forms which fome minerals moft frequently affume, and which are rarely, if ever, feen in other minerals. Hence we might at firft be led to infer, that cryftallization depends on the definite action of fome general law, by which the constituent parts of each mineral fpecies are invariably arranged in the fame form. When, however, it is farther difcovered that, befides the prevailing forms peculiar to certain minerals, the fame fpecies are not unfrequently cryftallized in a variety of diffimular forms, and that minerals of different fpecies often prefent cryftals of the fame form, we muft retract our firft conclufion, and fhall be more difpofed to believe that the mineral kingdom has not yet emerged from a chaotic ftate, or that the reign of order is fubject to the invafion of difturbing forces, the extent of which we have no means of afcertaining.

The labours of a few enlightened and indefatigable philofophers have recently removed, in a great degree, the obfcurity in which this department of feience was involved, and have demonstrated that the laws by which the particles of the minutelt cryftal are arranged act with unerring precision, and are not lefs regular than thofe which govern the motions of the planets or the folar fyftem.

Under the article **CRYSTAL** (which fee), fome account is given of the difcoveries of Romé de Lifle, Bergmann, and Häuy. The latter has ably demonstrated that all the varieties of cryftalline forms are reducible to a few fimple primitive forms, fome one of which may be regarded as the nucleus of each cryftal, however complicated its form may be. The constituent particles, or what Häuy denominates the *integral molecules*, of all cryftals, may be conceived as arranged in rows, and a number of thefe rows as forming thin laminae or plates. When thefe laminae are parallel with all the faces or planes of a cryftal, they may be removed without changing the form of the cryftal; but if the laminae divide in any other diretion than that which is parallel to the faces, a change of form will be produced by every divifion, until at laft we obtain a nucleus which is divifible in a diretion parallel to its fides.

In the former cafe, the primitive form is the form of the cryftal itfelf. Thus, if a cubic cryftal be divifible only by laminae parallel to its fix fides, we may continue diminiſhing

the magnitude of the cryftal, as long as mechanical divifion is poffible without any change of form.

When the laminae of a cryftal divide in any other diretion than parallel to its faces, it is called a fecondary form or derivative cryftal.

The primitive forms of all cryftals which have been hitherto examined are fix.

1. The paralleloiped, bounded by fix planes, the oppofite planes being parallel. This includes the cube, and varieties of the rectangular prifm, the oblique angular prifm, and the rhomboid.

2. The octahedron. This is a double four-fided pyramid. When the triangular faces are equilateral, it is called a regular octahedron. (Plate VII. fig. 27, *Cryftallography*.) There are, befides this, other varieties of the primitive octahedron, in which the pyramids are longer or fhorter than the regular one, or have a rhomboidal bafe, or a rectangular bafe, longer in one diretion than the other.

3. The regular tetrahedron (Plate VII. fig. 13.) is bounded by four equilateral triangles.

4. The regular hexahedral prifm, or equiangular fix-fided prifm, fig. 5.

5. Rhomboidal dodecahedron, bounded by twelve equal rhombs, fig. 12.

6. The pyramidal dodecahedron, confifting of two fix-fided pyramids joined bafe to bafe, fig. 14.

The primitive forms which moft frequently occur are, the paralleloiped and the octahedron. The tetrahedron and dodecahedron are very rare as primitive forms, though common as the fecondary forms of cryftals.

The divifion of fecondary cryftals by fections in the diretion of the laminae is, in fome minerals, effected with facility; in others, the joints are indiftinct, and require the cryftal to be heated and plunged into cold water to make them vifible. The diretion of the laminae is frequently rendered obvious by turning a mineral flowly round in the funfhine, when the reflections from the internal parts will fhew its ftucture. Where no joints are difcoverable, Häuy determines their diretion and the form of the primitive nucleus by conjecture, from the appearances offered by the fecondary cryftal.

The actual mechanical diffection of an hexahedral cryftal of calcareous fpar, and the extraction of the primitive, is reprefented in Plate II. figs. 17, 18, 19, 20, *Cryftallography*, and is defcribed under the article **CRYSTAL**, but the references are erroneouly made to Plate I. figs. 1, 2, 3, 4, 5.

The primitive nucleus is reprefented fig. 21, E A, O I, G H, A K. The difcovery of it in this cryftal was firft made by the abbé Häuy in looking over the cabinet of M. Defiance, a hexahedral prifm of calcareous fpar having fallen from the group to which it was attached. M. Defiance made him a prefent of it. One of the corners being off from the bafe, he attempted to detach fimilar corners from the other angles, and after fome time he fucceeded in bringing to view its rhomboidal nucleus. This firft fuggelted to him the theory of the ftucture of cryftals. The ftuation of the primitive form, in another variety of calcareous fpar, called the dog-tooth fpar, may be feen Plate II. figs. 22 and 23. This is defcribed under the article **CRYSTAL**, with the mode of extracting the nucleus; but the reference is erroneouly made to Plate I. figs. 6 and 7. The angles of the primitive rhomb are invariably $105^{\circ} 5'$ and $74^{\circ} 55'$. Rhomboids of calcareous fpar, indeed, occur with different angular admeafurements; but thefe are fecondary cryftals, and will not fplit in directions parallel to their faces. One of thefe, with the primitive nucleus, is reprefented

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represented *fig. 24*. The theory of their formation will be explained as we proceed.

The primitive form is not in all cases the ultimate form to which crystals can be reduced; for where the primitive form is not a parallelepiped, the division parallel to the faces necessarily produces forms which must vary from that of the primitive nucleus. See *Plate V. fig. 56. Crystallography*, which represents the base of a six-sided prism, divided by sections parallel to each of its sides: from this division the ultimate form which we can ever obtain must be that of a triangular prism; for by carrying on the division we may conceive the particles to become smaller, but their form will remain the same. We have therefore obtained the form of the integrant molecule. In parallelepipeds, the form of the nucleus is also that of the molecule itself.

Thus in the cube, as represented *Plate IV. figs. 48 and 49*, the divisions parallel to the sides produce a series of smaller cubes, which must be the form of the integrant molecule. In some instances, the primitive forms themselves admit of division by laminae not parallel to that of the faces, from which must necessarily result a new form of the integrant molecule.

Plate II. fig. 26. represents a primitive rhomboid of tourmaline $\text{A E, O I, G H, A K}$, which is divisible both in the direction of its six faces and in that of the short diagonals A O, I A', A K . These latter sections divide the rhomboid into six tetrahedrons, which are represented surrounding the nucleus. Häuy conceives, that by these divisions, we obtain the form of the integrant molecule, or of the ultimate integrant atom of the crystallized mineral. It has been observed, that no proof can be advanced to confirm this conjecture, except the impossibility of altering the form, how far soever we carry the divisions; and the obvious consequence is, that if these divisions be carried far enough, we must at last reduce the crystal to its integrant particles. It is not, however, necessary to suppose, that the constituent particles themselves have any other form than that of spheres; because all the forms of the integrant molecule, which are the tetrahedron, the triangular prism, and the cube, may be readily conceived to be constructed with four, six, and eight spherical particles, arranged in their forms by crystalline polarity. It deserves attention, that the forms of the integrant molecule are the most simple which can exist among solids with plane surfaces, being bounded respectively by the smallest possible number of sides, *viz.* four, five, and six.

If we conceive the integrant molecules to be arranged in rows, and a number of these rows to be arranged in the same planes, they will form laminae of any conceivable size. Now by a succession of plates increasing in size, the magnitude of the primitive crystal will be increased; but if these laminae decrease in extent by one or more rows of particles, the result will be a change of form, or the production of a secondary crystal. Now the laminae may either decrease on the edges by one or more rows, or may decrease diagonally on the angles by a determinate number of rows, or the decrease may take place in some intermediate direction. These are called by Häuy, decrements on the edges, decrements on the angles, and intermediate decrements. Sometimes decrements take place at once on all the edges, sometimes upon all the angles, and sometimes only on certain edges and angles. In some instances the decrements are uniform, and the same number of rows decrease from the different edges or angles. Sometimes the law of decrement varies from one edge to another, or from one angle to the other; and this happens chiefly when the nucleus has not a symmetrical form, or when it is a parallelepiped, whose

faces differ in the respective inclinations of their faces, or in the measure of their angles. In certain cases, the decrements on the edges concur with those on the angles to produce the same crystalline form. It happens also, that the same edge, or the same angle, sometimes undergoes different laws of decrement that succeed each other; and, finally, there are a great many cases where the secondary crystal preserves faces parallel to those of the primitive form, and which combine with the faces produced by the decrement, to modify the figure of the crystal.

If, in the midst of such a diversity of laws, sometimes acting solitarily, and sometimes in combination upon the same primitive form, the number of ranges subtracted were likewise variable; if, for instance, there were decrements of twenty, thirty, forty, or a greater number of ranges of molecules, of which it is very possible to conceive, the multitude of forms which might exist in each mineral species would be sufficient to appal the imagination, and the study of crystallography would present an immense labyrinth, from which even the assistance of theory could not extricate the learner.

But the force which produces the decrements of ranges appears to have a very limited action. Generally these subtractions take place by only one or two rows of molecules. None have hitherto been found beyond six rows; but such is the fecundity united with this simplicity, that were we to confine ourselves to decrements by one, two, three, and four rows, and to exclude those that are mixed or intermediate, we find that the rhomboid is susceptible of 8,388,604 varieties of crystallization. Doubtless many of these varieties do not exist in nature; but there is reason to expect that discoveries in the field of inquiry will be made for many years to come.

The tetrahedron and the triangular prism, when they occur as integrant molecules, are always arranged in such a manner in the interior of crystals, that, taking them in groups of two, four, six, eight, they compose parallelepipeds. These parallelepipeds are, by Häuy, named *substractive molecules*. They are always substituted in the place of tetrahedrons and triangular prisms in considering the decrements where they produce the secondary forms.

Decrements of the Edges.—The most simple case of change of form produced by the superposition of decreasing laminae, is that which supposes ranges of molecules to be taken away on all the edges of a parallelepiped, in a direction parallel to the edges. Yet this case, so simple in appearance, may give rise to forms of considerable complexity. Thus the rhomboidal dodecahedron (*Plate II. fig. 27.* or *Plate III. fig. 28. Crystallography*) may be formed in this way from a cubic nucleus. If the integrant molecule of this species be a cube, it follows that the primitive crystal $\text{E A, O I, and E' A', O' I'}$, is formed by a congeries of cubes. Suppose these cubes of such a size, that an edge of the primitive crystal is composed of a row of seventeen cubes, placed side by side, as represented *fig. 29. I O, O E*: of course each face of the primitive crystal will be a congeries of 289 squares, consisting of so many integrant molecules; and the primitive crystal or cube will be a congeries of 4913 cubes. Let us suppose that a square surface or plate, of the thickness of one integrant molecule, be applied to every face of cube; but that instead of being of the same size as the face of that crystal it is less by a single row of molecules all round; so that the sides, instead of containing seventeen little cubes, contain only fifteen each (*see fig. 29.*); of course this square will contain only 225 little cubes, instead of the 289 that form the surface of the primitive crystal. Upon each of these first plates applied to every face,

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face, let another plate be applied similar to the first, but less than it by a row of integrant molecules; so that each side contains only thirteen squares, and the whole only 169 squares. Let six other plates be applied in succession to each of the faces, decreasing by a row of little cubes all round; so that the sides consist of eleven, nine, seven, five, three, and one squares respectively. It is obvious, that by this process we have raised upon each of six faces of the cube a four-sided pyramid, the faces of which, instead of being smooth, will, by their constant diminution of bulk, represent the steps of stairs. If, however, we conceive the molecules to be extremely small, and the number of decreasing laminae to be increased, the steps of the stairs may be so small as to be imperceptible to the eye, in which case the surfaces of the pyramids will appear smooth.

These pyramids having each four faces constitute twenty-four triangular faces, so that the cube is converted into a new crystal. Instead, however, of having twenty-four faces, the decrements having been equal on each edge, the triangular faces in each adjacent pyramid will be in the same plane, and form together a rhomb, which will be evident from the inspection of *figs.* 28 and 29; the cube will therefore be converted into a rhomboidal dodecahedron. The cubic nucleus $I' I', O O', E E',$ *fig.* 29, is represented with the pyramids raised on three of its faces. When complete, it will have the form represented in *Plate II. fig.* 27. If the decrement had taken place by two ranges on each of the laminae, when applied to the cube the pyramids would have been lower; and their adjacent faces being no longer in the same plane, the secondary crystal would have terminated in twenty-four distinct triangles.

In the example given (*fig.* 29.) it will be seen, that as each of the laminae decreases by one row on each of its edges, *viz.* one on $I O,$ and another on the inferior row $I' O',$ and the same on the other edges, it is obvious that the pyramid decreases by two rows in breadth for every row in height; therefore the height will be equal to half the breadth at the base.

The terms *decrement in breadth,* and *decrement in height,* are thus explained by Häuy. Decrements in breadth are those in which the thickness or height of each plate or lamina is only equal to one integrant molecule; and the result of the decrement is by one, two, three, or more ranges in the direction of the breadth.

Decrement in height implies a decrement of one row in breadth on each of the successive plates; but each of these rows may have the thickness or height of two, three, or more molecules. In the latter case, the decrement is said to take place by two, three, or more ranges in height.

These two kinds of decrement are often combined together, of which we have an example in iron pyrites with twelve pentagonal faces. (*Plate III. fig.* 30.) This variety has a cube for the nucleus, as represented *fig.* 31; and may be conceived to be formed, as represented *fig.* 32, by decrements of two ranges in breadth in one direction, and by decrements of two ranges in height in the other. The decrements in breadth by two ranges tend to produce a more inclined face than the decrements by two ranges in height; the consequence resulting is, that the crystal will not terminate in pyramidal points, but in wedges, as is seen at *qp,* *fig.* 32. The structure of this crystal is more particularly described under the article *CRYSTAL;* but for *Plate I. Nos.* 14, 15, 16. *r.* *Plate II. fig.* 30, 31, 32. *Crystallography.*

Another example of decrements on the edges is deserving particular attention: it is afforded by that peculiar kind of crystal of calcareous spar, commonly called dog-tooth spar,

or which Häuy denominates the metaclastic crystal. (*Plate II. fig.* 22.) In this crystal, the edges $E O, O I, I K,$ where the two opposite pyramids join, coincide with the edges of the primitive nucleus, as may be seen in *fig.* 23. The decrements set out from these edges, and do not take place on the other six edges of the nucleus. Now it is easy to conceive, that the edges of the plates, laid upon the primitive nucleus, form as many triangles, $E s O, I s O, E' s' O,$ &c. resting upon the edges from which they set out; and as there are six in number, there will be twelve triangles, six above and six below; and these will all be scalene, in consequence of the obliquity of the edges from which they set out.

With respect to the other edges of the plates of superposition, so far from experiencing any decrement they will increase; because they must always remain contiguous to the axis of the crystal, which is an imaginary line drawn from s to s' . It is from calculation combined with observation, that we must determine the law of decrement on which this dodecahedral form depends. If we suppose a decrement by one range, it may be demonstrated, that the two faces produced on each side of the edge from which the decrement takes place will be in the same plane, and parallel to the axis of the primitive crystal, conditions which do not apply to the present form. The most simple hypothesis is that which supposes a decrement by two ranges in breadth. This will be more clear from inspecting *Plate III. fig.* 33: it represents the upper pyramid of this crystal, placed on the upper planes of the primitive nucleus, which being partly visible, admits us to perceive more clearly the progressive effects of the decrement by two ranges.

Each edge of the nucleus, as $K I, I O, O E,$ is divided into ten; from whence it follows, that each face is an assemblage of one hundred small rhombs, which are the exterior planes of so many molecules. This construction requires only eight plates of superposition for each face of the nucleus; and these plates being joined to each other, three and three on the edges, which correspond with the upper edges of the nucleus, form decreasing envelopes, covering each other in succession; the last of which is composed of eight little rhomboids. If we consider the position of the line $E s,$ which represents an edge of this pyramid, as it appears to the eye, and $E s',$ such as it really exists, we may observe that the geometrical summit of the pyramid s is placed a little above the true summit s' ; but this difference is imperceptible, on account of the extreme minuteness of the molecules: and for the same reason, the channels or steps upon the pyramid are not visible. There are cases, however, in which the channels may be perceived by the naked eye.

For determining the form of secondary crystals by calculation, it is only necessary to take the decrements at their commencement, in order to have as many planes, which, if we conceive them to be extended until they meet, would form a complete polyhedral crystal; and in this manner we only consider the initial effects of decrements mathematically, a method more simple and expeditious than that of reasoning. It is useful, however, to explain in detail the structure of a crystal, in such a manner as may enable us to arrange a number of small solids similar to primitive molecules to form a nucleus, in an order conformable to that of nature, and thus to imitate the process of crystallization. We shall give another example from that variety of calcareous spar, called by Häuy equiaxe.

This variety, the secondary crystal, is a rhomboid, much more obtuse than the nucleus, the greater angle being $114^{\circ} 18' 56''$. It is represented (*Plate III. fig.* 34.) surrounding the nucleus. To extract the latter at once, it is only

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only necessary to make sections cutting through the oblique diagonals of the different faces of the secondary rhomboid. One of the sections, for instance, that which passes through the diagonals drawn from a to t , and from a to u , and which cuts off the solid angle z , coincides with the face $a b, d f$, of the nucleus. But there are six lateral solid angles z, c, y , and t, m, u . We have, therefore, six sections to make, inclined three and three towards each summit; and because the upper solid angles alternate with the inferior, the sections which cut them off preserve the same alternation, and cross in such a manner as to present the six rhomboidal faces of the nucleus.

To conceive the structure of this secondary rhomboid, let us refer to the rhomboidal dodecahedron (*Plate III. fig. 29.*) before described. We have seen that by a decrement of one range in breadth on all the edges, there resulted two triangular faces on each edge, which being in the same plane formed a rhomb, the short diagonal of which is $I O$.

Let us suppose, that the nucleus was the primitive rhomb of carbonate of lime ($a b, d f$, *fig. 34.*), and that the laminae of superposition decrease by one range of little rhomboids similar to the nucleus; but the decrements to take place only on the edges $a b, a f, a n$, which meet at the summit a , and on the opposite edges, which meet at the opposite point d' . Then instead of twelve rhombs there will only be six, of which the shorter diagonals will coincide with the edges $a b, a f, a n$, &c. The other parts of the laminae of superposition, that is, those which are situated near the lower edges, $b d, d f, f x$, &c. will not undergo any decrement, but will suffer variations that will tend to prolong the faces produced by these decrements, until they intersect each other. From hence it results, that the laminae, instead of preserving the figure of a rhomb, as would have been the case if the decrement had taken place on all the edges, will, as they are further and further removed from the nucleus, pass successively from the figure of a pentagon to that of a triangle.

Fig. 35. $a b, d f$, is the face of the same nucleus or rhomb as in *fig. 34.*, and what is said of this face may easily be applied to the others. Suppose this face divided into 81 rhombs, which represent the faces of so many molecules, or 729 in the whole. The first lamina of superposition, which we apply to the face $a b, d f$, will be B , *fig. 35.*, in which $U l, Z l, d'$, represent the upper face, and $C U l b, X Z l b$, the facets of the two upper edges. We must place this lamina in such a manner on the face $a b, d f$, that the point b' shall unite with the point b , the point A' with the point A , and the point B' with the point B . We shall perceive immediately, that the two upper ranges of the face $a b, d f$, *fig. 35.* A , that is, those included between $a b, A b$, on one side, and $a f, B b$, on the other, will remain uncovered, the necessary result of a decrement by one range of molecules. The lamina B is a pentagon resulting from the subtraction of the three little rhombs necessary to complete the rhomb. This subtraction was required, that the lamina by its figure might aid the effect of the decrement, as will be afterwards explained.

The two ranges of rhomboids on each side of the lines $D d', E d'$, are added, that the nucleus may be covered and continue to increase on the edges $b d, f d, A$, *fig. 35.*, which correspond with these lines. These two ranges being sufficient to fill up the void, it is not necessary to add similar ranges towards the adjacent edges of the laminae of superposition, applied on the neighbouring faces. The operation will indicate of itself what is required in these kinds of additions.

The *fig. C*; 35. represents the second lamina of super-

position, which is to be applied to the former in such a manner, that the points i', D', E, d' , shall unite with those which are marked with the same letters in *fig. B*. As the crystal will receive another increase towards the edges, which correspond with $F d', C d'$, we may conceive that instead of one range added on each side $D d', E d$, *fig. B*, it will be necessary to add two on each of the two lines $E d', C d'$, *fig. C*, 35.

We must place in the same manner, in succession, the two laminae represented D and E , *fig. 34.*; observing that the letters marked with an accent in each figure shall coincide with the same letters not accented in the preceding figure. Beyond the series which answers to *fig. E*, the laminae of superposition will cease to envelope the lower edges of the crystal, and will be reduced to simple triangles, which may be perceived on examining the figures E, F, G, H , whose position will be determined according to the conditions before stated.

The number of rhomboids which compose the laminae being now progressively decreasing, is reduced at last to a single rhomboid d' (*fig. D*, 35.), which being applied on that which is designated by the same letter in *fig. H*, will form the summit of one of the lateral solid angles of the secondary rhomboid. It will now be seen why the laminae of superposition take successively pentagonal and triangular faces as they recede from the nucleus. For example, every lamina, detached from the crystal (*fig. 34.*) by a section which passes any where between the angle z , and the middle of the lines $Z t, Z u$, is necessarily triangular, and has the same structure as $P' t R'$, *fig. G*, 35; namely, it is really furrowed at its base, but the ridges are imperceptible on account of their extreme minuteness.

Decrements on the Angles.—To explain the formation of secondary crystals, in many instances it is necessary to admit that the decrements take place on the solid angles. The formation of the regular octahedron formed on the cube is represented *Plate III. fig. 36. Crystallography*, and an account of it given under the article *CRYSTAL*, but the reference is erroneously to *Plate I. fig. 20.*

The effect of decrement on the angles by one range of molecules in breadth is explained in the article *CRYSTAL*, and a reference made to *Plate I. fig. 21*, for which see *Plate II. fig. 21. Miscellany*, $O I, I' O'$; where the face of a cubic nucleus is represented as divided into a number of lesser squares; and *fig. 23.* $A, B, C, D, E, F, G, H, I$, in the same plate, represent a successive series of plates, or laminae, placed on the cubic nucleus, each decreasing by one row on the angles. These are described under the article *CRYSTAL*, but referred to *Plate I. fig. 23*; by applying that description to the proper figures as here given, the reader will be able to comprehend this case of decrement, where a regular octahedron is formed on a cubic nucleus. The arrangement of the integrant molecules on one of the triangular faces of the octahedron is represented *Plate IV. fig. 37. Crystallography*.

If the decrements on the angles of a cube were to stop before they terminated in a point, there would remain faces parallel with that of the cube, which will be evident from inspecting *Plate III. fig. 36.* The crystal would then have fourteen faces, eight those of the octahedron, and six those of the cube. Nothing is more common than to find such crystals both in iron pyrites and in galena.

As another example of decrements on the angles, let us take the rhomboid (*Plate IV. fig. 38.*), which differs somewhat from the cube. If the plates applied successively upon all the faces of this rhomboid suffer decrements only at the angles contiguous to the summits A and O' , and that these

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these decrements take place by two ranges, then instead of twenty-four faces, only six would be formed; and if we conceive these prolonged till they meet each other, they would conjointly form a very obtuse rhomboid (*fig. 39.*) encircling the nucleus. The summits A, O' , coincide with the summits of the nucleus, from which the decrements commenced, and each of the faces $AeiO$ corresponds with one of the faces of the nucleus; so that the diagonal which passes through the points ei is parallel with the diagonal EI of the nucleus, but somewhat more elevated. This kind of crystal is found among the secondary crystals of oligite iron-ore.

As a further illustration of the different variations of which the decrements, whether of the superior or inferior angle, are susceptible, let Gg be any rhomboid whatever (*Plate IV. fig. 45.*), the summits of which are Ss . Let Sg'' , sg'' , *fig. 46.* be a quadrilateral figure formed by cutting through the rhomboid Gg in the direction of a plane, formed by the two oblique diagonals Sg'' , sg'' , *fig. 45.* and the edges SG , Sg'' . This quadrilateral figure, termed by Haiüy the principal section of the rhomboid, is divided in the figure into a number of small quadrilaterals representing the principal section of as many molecules. Let $SG, g''G'$, *fig. 47.* be the face of the rhomboid, *fig. 45.* marked with the same letters, and subdivided into the bases of the molecules of which it is composed. If we suppose that the angle g'' undergoes a decrement by a single row of molecules, the small rhomboid represented by $on'zg''$ will be wanting; hence it is obvious, that the edges of that plate will have the direction oz , and that the distance between the angle g'' , from which the decrement sets out, and the edge oz , will be measured by the femidiagonal of a molecule, or rg . If the decrement took place by two ranges, the edge g , the first plate of superposition, will correspond with cd , and the distance between it and the angle g'' will be measured by the diagonal molecule gn . Hence we may conclude, that in the decrements on the angles, the distance between one plate and the succeeding one, which is the same as between the point of departure and the edge of the first lamina, is equivalent to as many femidiagonals of a molecule as there are ranges taken away, as will be further evident by inspecting *fig. 37.* But in decrements on the edges, the distance between two successive plates is equal to the breadth of as many molecules as are taken away.

This being understood, let us suppose a decrement of two rows upon the angle g'' . In that case, the quadrilateral $neap$, *fig. 46.* being a section made in the first plate of superposition, the decreasing edge of this plate will coincide with the little edge en , since gn is the same diagonal as in *fig. 47.*; therefore if we draw the straight line $g'''eb$, it will coincide with the face produced by the decrement. But $g'''b$ being, in this case, parallel to the axis Ss , as may be demonstrated geometrically, hence it follows that the secondary faces constitute the faces of a prism. If the decrements went on more rapidly, the faces of the secondary crystal would have different angles of inclination to the axis, as will be evident from inspecting *Plate IV. fig. 46.* If the decrement were by four ranges, for instance, the edge of the first plate of superposition would coincide with the line yg ; then the line $g'g'S'$ indicates the position of the face produced by the decrement. What has been stated, where the plane is parallel to the axis, holds true with respect to all possible varieties of the primitive rhomboid.

*Mixed Decrement*s are those in which the number of ranges taken away in breadth and height give ratios, the two terms of which surpass unity. As, for example, decrements by two ranges of molecules in breadth, and three in height, or

by three ranges in breadth and two in height, &c. It is easy to see, that the theory may with facility be reduced to that of decrements, in which there is only one row of molecules taken away in one of the two directions.

*Intermediate Decrement*s.—These will be best explained by references to the figures.

Let $A A'$, *Plate IV. fig. 48.* be a parallelepiped of any kind, which undergoes a decrement by two ranges on the angle $E O I$ of its base $A E, O I$. It is obvious, that the edges of the plates of superposition will have the directions bc, rs , parallel to the diagonal $E I$, and so situated that these will be upon the sides $O E, O I$, two rows of molecules comprehended between the angle O and the line bc , and likewise between bc and rs . But, as has been already said, the plates applied upon the adjacent faces $I O, A' K, E O, A' H$, undergo likewise auxiliary decrements, which continue the effect of the decrement upon the angle $E O I$. But such, in this case, are the effects of these decrements, that the edges of the plates applied upon $I O, A' K$ have the directions cg, st , and those of the plates applied upon $E O, A' H$, the directions bg, nt ; for since the lower edge of the first plate applied upon $E O I$ coincides with bc , and the height of this plate corresponds to that of a single molecule, a little attention will satisfy us, that the plane bcg , which, on one part, coincides likewise with bc , and, on the other, separates from the base $A E, O I$ by a quantity measured by Og , the height of a single molecule, is necessarily parallel to the face produced by the decrement. The same holds with the plane rst . From this it follows, that if we suppress the part situated above rst , we shall have a solid on which the face rst will represent the effect of the decrement which we are considering.

Now the direction cg, st , of the plates applied upon the face $I O, A' K$, (and the same may be said of the face $E O, A' H$.) in consequence of the auxiliary decrements, are neither parallel to the edge, nor to the diagonal of the face, but intermediate between the one and the other. This want of parallelism will become still greater, if we suppose the decrements upon the angle of the base $E O I$ to take place by three or four ranges. This is the kind of decrement to which the name of intermediate has been given. It is obvious, that it may take place in an infinite number of different directions, according as it deviates more or less from its two limits, the parallelism with the edge and the diagonal of the face.

In cases similar to those of *Plate IV. fig. 48.* we avoid the complication introduced by these intermediate decrements, by supposing them comprehended under the principal decrement. But certain crystals exist in which all the three decrements round the same solid angle are intermediate. In such a case, the simplest of the three is chosen as the principal decrement, and the other two considered as auxiliary. *Fig. 49.* represents a case of this kind: cn , which is the edge of the first of the plates applied upon $A E, O I$, is so situated, that on the side of $O I$ there are three molecules subtracted, while on the side $O E$ there is only one: ap , which is the edge of the first plate applied upon $I O, A' K$, indicates three molecules subtracted from $O I$, and two from $O A'$: cb , which is the edge of the first plate applied upon $E O, A' H$, shews the subtraction of two molecules on $O A'$, and only one on $O E$.

It is easy to see, that the decrements take place relatively to the different faces situated round the angle O , as if the molecules that compose the different plates of superposition being united invariably several together, compose other molecules of a higher order, and as if the subtraction took place by single ranges of these compound molecules. Thus there

will

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will be on the base $A E, O I$, a decrement of triple molecules by two ranges in height, since on one part, the quadrilateral figure $c O n z$, which represents the base of a compound molecule, is equivalent to the bases of three simple molecules; and on the other, the line $O p$, which corresponds to the height of a plate of superposition, is equivalent to the height of two simple molecules. It is easy to conceive likewise, that the decrement relative to the face $E O, A' K$, takes place by two ranges in height of double molecules; because $c O p x$ contains the bases of two simple molecules, and $O n$ is equal to the length of three simple molecules. In the decrement which takes place upon $I O, A' K$, there is a subtraction of one row of molecules, triple in one direction, and double in the other.

Among these three decrements, the one which it appears natural to adopt as the principal, is the second which takes place upon the face $E O, A' H$; because it is the one whose direction deviates the least from that of the diagonal $E A'$, or because it takes place by double molecules, which is a more simple decrement than the other two.

To give some further examples of intermediate decrements, let us suppose $O I, I' O'$, one of the faces of cubic nucleus (see *Plate IV. fig. 50. Crystallography*); and that the decrement took place on the angles by the subtraction of double molecules: in this case, the edges of the laminae of superposition will be in the direction of the lines $d n, k m, a b, c h, \&c.$

Let $E I', fig. 51.$ be a cubic nucleus, and suppose the decrements are made parallel to the lines $k m, l m, k r, l r$, always by subtraction of double molecules, but in such a manner, that there shall be three ranges taken away in the direction of the breadth, and one in that of the height: in this case, the decrements will be both intermediate and mixed. Suppose also that the edges of the laminae of superposition, situated around one solid angle O , had directions which crossed, so that with respect to the face $O I, I' O'$, the greatest number of the faces of the molecules should be taken away on the side $O I'$; but on the face $E O, O E$, it should be on the side $O O'$, and with respect to face $E A, I O$, it should be on the side $E O$; the effect of these different decrements would produce three faces round each solid angle, which would be situated in an inclined manner with respect to the faces of the nucleus; and because the cube has eight solid angles, the secondary crystal would have twenty-four faces, which would tend to unite four and four, and form the summit of a pyramid round each face of the nucleus. But if we suppose the decrement to cease before these are completed, there will remain six faces parallel to those of the nucleus, and we shall have a polyhedral crystal of thirty faces, as represented *fig. 52.* The angles $k m, l r$, corresponding with those of the nucleus, are rhombs; and the faces $m' n', r o$, are equal and similar trapeziums. This form is that of one of the varieties of iron pyrites.

Suppose intermediate decrements on the two lateral angles of a rhomboid $G G', Plate IV. fig. 47,$ and that these decrements take place by ranges of double molecules, parallel to the faces $u m, x y, u' m', x' y'.$ It is evident, that these decrements will produce above each rhomb of the primitive nucleus $S G, g' G'$, two faces, which, commencing at the angles $G G'$, will converge towards each other, and come in contact in a line situated above the diagonal $S g'$, but inclined to that diagonal; so that the complete result of the decrement will be the formation of twelve faces, disposed six and six towards each summit. *Plate IV. fig. 53.* represents one of these solids, with its nucleus inscribed. It is a variety of calcareous spar which some-

times occurs. The lines $ab a'$ shew the direction of a fracture parallel to the face $G g', G' S$, of the primitive nucleus. It appears from this figure, that the nucleus does not touch the secondary crystal, except by its lateral angles, which are situated in the edges $B S', D s', C s', \&c.$ while in the dodecahedron of Bergmann, represented in *Plate II. fig. 22,* and called by Häuy *metastalt calcareous spar*, the lateral edges of the nucleus coincide with those edges of the secondary crystal that constitute the common basis of the two pyramids, as is evident from inspecting *Plate II. fig. 23.*

Hitherto immediate decrements have been observed only in a small number of instances, but they lead to forms as simple as the other, and give some curious results, which deserve to be studied in a mathematical point of view, without any reference to crystallography.

Compound secondary Forms.—Simple secondary forms are those which proceed from a single law of decrement, the effect of which covers and conceals the nucleus, which only touches the secondary crystal by certain angles or edges. Compound secondary forms are those which are produced by several simultaneous laws of decrement, or by one law which has not reached its limit; so that faces remain parallel to the original faces of the nucleus, which further modify the faces of the crystal.

Suppose, for instance, the law which produces the octahedron from the cube (*Plate III. fig. 36.*) should concur with that from which results the dodecahedron with pentagonal faces. (*Plate III. fig. 31.*) The first of these laws would produce eight faces, which would have for centres the eight angles of the cubic nucleus. Each of these faces, as, for instance, that whose centre coincides with the solid angle $O, fig. 31,$ will be parallel to the equilateral triangle, whose sides pass through the points $p s t, fig. 34;$ in like manner, the centre that coincides with the front O' will be parallel to the equilateral triangle, whose sides pass through the points $s n p, Plate IV. fig. 54.$ But the second law produces faces situated as the pentagon, cut by the sides of the triangles $p s t, s n p.$ Now the section of these triangles upon the pentagon $t O s, O' n, fig. 31,$ reduces the pentagon to an isosceles triangle, which has the line $t n$ for the base: the two other sides are those which pass through the points $t s, n s.$ The same takes place with the other pentagons. Hence it follows, that the secondary crystal produced will be an icosaedron, bounded by eight equilateral triangles, and twelve isosceles triangles. (See *Plate IV. fig. 54.*) This icosaedron occurs in iron pyrites; it is different in its form from the regular icosaedron of geometers: the latter form does not exist among crystals, and cannot be produced by any law of decrement. The same remark applies to the dodecahedron, bounded by twelve regular and equal pentagons.

Another illustration of a compound secondary form is offered in the regular six-sided prism of calcareous spar. (*Plate II. fig. 17.*) From the manner of dissecting this prism, (see *CRYSTAL*), it is easy to conceive that the rhomboidal nucleus, *fig. 21,* has six of its solid angles $E, O, I, K, G, H,$ situated in the middle of the lateral faces of the prism: hence it follows, that these angles are the points from whence the decrements set out from the three plane angles of the rhomb $E O I, E O A', I O A',$ which form the solid angle O ; but it is only necessary to consider the decrements on one of them, supposing the same decrement extends on the two adjacent planes that form the solid angle. Let us then refer all the decrements to the six angles $E O I, E H G, I K G, H G K, O I K, H G O,$ the first of which are turned towards the summit $A,$

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and the three left to the summit A' . If we suppose a decrement by two ranges of rhomboidal molecules on these different angles, six faces will be produced parallel to the axis, as has been already observed.

The plates of superposition, at the same time that they undergo a decrement towards the inferior angles, will extend by their superior parts, so as to remain always contiguous to the axis, the length of which will progressively be augmented. The small faces produced by the decrements on the angles will gradually increase till they touch each other; we shall then have the solid represented AA , *fig. 20*, where each of these small faces, as oOo , is marked with the same letters as the angle to which it belongs, and which is now situated in the middle of the triangle, because it constitutes the point from which the decrements set out. As new plates are applied, the points or line oo rise up, and the point O sinks down; so that at a certain period we shall have the solid represented *fig. 19*, where the faces produced by the decrements become pentagons ooi , Oo .

Let us now suppose a second decrement to concur with the first, and to take place by a single range upon the superior angle EAI and the inferior angle HAK , and also on the other faces of the rhomb which form the solid angles A and A' ; the effect of this will be to produce two faces perpendicular to the axis; and when it has reached the point at which these faces cut the six faces parallel to the axis which are produced by the first decrement, the secondary solid will be completed, and will be a regular six-sided prism. (*Plate II. fig. 17.*) It has been already said, that the result is general, whatever be the form of the primitive rhomboid. It may now be seen why, in the mechanical division of the prism, the section pp , oo , has the sides pp , oo , parallel to each other, and to the diagonal of the nucleus EF , *fig. 21*. Since the two decrements taking place, one upon the angle EAI , the other upon the angle EAI , the plates of superposition ought to have the edges formed by the decrements parallel to the same diagonal, or to EI .

In the case we have been considering, and which is the most common, the axis of the secondary crystal is longer than that of the nucleus; but if we suppose the two decrements to commence at the same time, then the axis of the prism being equal to that of the nucleus, both the lateral angles and the summits of the nucleus would touch the prism, the one on the sides, and the other the bases. If the decrement were to commence on the superior angles prior to the lateral decrements, the summits of the nucleus would then be contiguous to the bases of the prism, whilst its lateral angles would be wholly within the prism, between its planes and axis. This is the case with certain crystals, in which the prism is very short, and resembles an hexagonal plate.

Another remarkable example is offered in that variety of calcareous spar, called by Häuy *analogique*. (See *Plate IV. fig. 55.*) It is composed of twenty-four trapezoidal faces, of which six are vertical faces, as $dabc$, $d'a'b'c'$, and twelve others, disposed six and six, as $c'pa$, and $c'p'a''b$, &c. and six terminal faces, as pa , $p'a$. The vertical trapezoids result from the same law that produces the hexahedral prism (*Plate II. fig. 17.*); the second result from the law which produces the metafacial crystal, *fig. 22*. In comparing *fig. 55* with *fig. 21*, we may see that the vertical faces cut those of the metafacial crystal, so as to interest the lateral solid angles $E O$, $I K$, &c. *figs. 22* and *23*; and, lastly, the terminal faces result from a decrement similar to what produced the equiaxial crystal. (*Plate III. fig. 34.*) *Fig. 55.* A , B , C , D , represents the different trapezoidal faces

of this crystal. Various relations of proportion between their sides and angles are given by Häuy, *Minéralogie*, tom. i. p. 85, 86.

It is a character common to all the primitive forms to be divisible, parallel to their faces. In the parallelepiped, where this division is not joined with some other in a different direction, it leads us obviously to the form of molecule similar to that of the primitive crystal. In the regular six-sided prism, it gives us for a molecule the triangular prism, as has been before observed. (See *Plate V. fig. 56.*) In the octahedron, it appears to produce two kinds of molecules, tetrahedrons and octahedrons. Häuy, in this case, conceives that the tetrahedron is the integrant molecule, and that the octahedrons are empty spaces between them. The difficulty is removed, by conceiving the molecules to be an assemblage of spherical particles, as we have before observed. The dodecahedron, with isosceles triangular faces, cannot have molecules extracted, without dividing it in directions different from those which are parallel to the face. The cutting-planes must pass through the axis, and through the edges contiguous to the summits, from whence will result irregular tetrahedrons. Some other primitive forms divide also in directions which are not parallel to the faces, as we have seen in the case of the tourmaline. See *Plate III. fig. 26.*

Thus, besides parallelepipeds, there are two other forms which integrant molecules assume, namely, the tetrahedron and the triangular prism; but it deserves particular attention, that the tetrahedral and prismatic molecules are always arranged in such a manner in the interior of crystals, that, taking them in groups of two, four, six, or eight, they compose parallelepipeds, so that the ranges subtracted by decrements are no other than these parallelepipeds; and we may consider such decrements as taking place by one or more ranges of rhomboidal molecules. If, for example, we take the regular six-sided prism (*Plate V. fig. 56.*), suppose one base of this prism divided by sections parallel to its sides into small triangles, which form the bases of the integrant molecule; it is evident that any two adjoining triangles, Api , AOi , compose a rhomb, and by their union the two little triangular prisms to which these bases belong would form by their union a rhomboidal prism or parallelepiped. It is obvious, therefore, that we may conceive the larger prism to be composed of similar rhombs. Now, if we conceive a series of plates piled upon the hexagon A, B, C, D, F, G , and which undergo, for example, on their different edges, a subtraction of one range of these parallelepipeds, these edges will successively correspond with the lines of the hexagon $lmnrhi$, $kuxyge$, &c. from which we see that the quantity by which each plate decreases is a sum of parallelepipeds, or prisms with rhomboidal bases; and if the decrement attains its limit, we shall have a right six-sided pyramid, which will have for its base the hexagon A, B, C, D, F, G . These parallelepipeds, composed of tetrahedrons or triangular prisms, are called by Häuy *subtractive molecules*; and as far as the theory of crystals is concerned, we may conceive all crystals to be composed of parallelepipeds.

Plate V. fig. 58. refers to a particular case described in a note by Häuy (tom. i. p. 96.), to explain the vacancies on the edges h, c, l, m ; but being of less importance, we proceed to state the observations of M. Häuy on some apparent anomalies in crystallization.

In common crystals, the faces adjacent to each other always form salient and never re-entering angles; but certain crystalline forms exist, which present the latter angles. Let Bd , *Plate V. fig. 60.* represent an oblique prism with rhomboidal

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rhomboidal bases, situated in such a manner, that the faces A D, $a d$, and C D, $c d$, are vertical, and B, D, are the acute angles of the base, and that these proceed in an ascending direction from A to C. Let us suppose also, that the prism is cut into two equal parts by a plane which passes through the diagonals drawn from B to D, and from b to d , and that the one half remained fixed, whilst the other is reversed without being separated from the former. The crystal will then be presented under the aspect seen in *fig. 61*, where the triangle $b' d' c$, which was one of the halves of the inferior base, *fig. 60*, is now situated in the upper part, *fig. 61*, and forms a salient angle or projecting edge with the triangle A B D. Whilst the triangle B D C, *fig. 61*, which was one of the halves of the superior base, *fig. 60*, is transported into the lower part, *fig. 61*, and forms a re-entering angle with the triangle $a b d$, we may easily conceive that the plane of junction D B, $b d$, of the two halves of a rhomboid is situated like a plane drawn, formed by a decrement on one range or other of the edges A, C, *fig. 60*, and thus the manner in which these halves join is in strict relation with the structure.

Now if we imagine a secondary form, which has for its nucleus a similar prism to the above, and if we suppose that it has been cut in the direction of the plane D B, $b d$, and that one of the halves has been reversed as in *fig. 61*, the arrangement may be such, that there will still be a re-entering angle at one termination, and a salient angle at the other, resulting from the mutual incidences of the faces produced by the decrements.

In certain cases, the plane of junction on which the two halves of the crystals are joined is situated parallel to one of the faces of the nucleus, and the arrangement does not admit of presenting a re-entering angle opposite to a salient one.

These crystals which are here described are called by Haüy *hemistropes*, or half reversed. Romé de Lisle has called such crystals marles.

Another accident extremely common is the manner in which crystals in groups are inserted into each other. This kind of penetration is subject to many diversities; but on accurate examination, we shall find that they are subject to certain laws always analogous to those of structure, and that these crystals, instead of being precipitated confusedly on each other, have a certain kind of arrangement. In illustration of this, let *Plate V. fig. 62*, be a cube, and M N R an equilateral triangular facet, produced by a decrement of one range round the angle A: let us suppose a second cube modified in the same manner, and attached to the former by a facet resulting from a similar decrement; we shall have the combination represented *fig. 63*.

We may also conceive that one of these cubes, for instance the lower one, is increased in all its dimensions, except in those places where the other forms an obstacle to its progress. As the increment continues increasing, it will more and more envelope the upper crystal, and may finish by covering it entirely. We observe crystals sunk into each other at different degrees of depth, but always in such a manner, that their plane of junction has a position analogous to planes resulting from decrement; so that both follow their common progress to this plane, which serves as their respective limit. Cubes of fluor spar inserted into each other have the laminae of each extended without interruption, until they are stopped by the common plane of junction.

The example here stated relates to a very simple and regular law of decrement. But frequently the laws which determine the plane of junction are more or less complicated, and there are a few which are rather extraordinary. When

two prisms cross towards the middle of their axis, there are two planes of junction which unite crossing each other, as in the mineral called staurotide, and these planes have positions analogous to those which would be determined by the known laws of decrement.

In the preceding theory of crystallography it has been constantly supposed, that the laminae composing crystals of the same species proceed from a common nucleus, undergoing decrements subject to certain laws, on which the forms of these secondary crystals depend. But this, says Haüy, is only a conception adopted to make us more easily perceive the mutual relations of the forms we are treating of. Properly speaking, a crystal taken as a whole is only a regular group of similar molecules. It does not commence by a nucleus of a size proportioned to what it afterwards acquires, or that which we can extract from it by mechanical division; and the laminae which cover this nucleus are not applied successively over each other in which the theory considers them. The proof of this is, that among crystals of different sizes that are often attached to the same support, those which can only be distinguished with the microscope are as complete as the largest; from whence it follows that they have the same structure, that is to say, they have already within them a small nucleus proportioned to their diameter, and enveloped by the requisite number of decreasing laminae to form the faces of the secondary crystal. We must therefore conceive, that from the first commencement a crystal similar to the rhomboidal dodecahedron is already a small dodecahedron, and contains a cubical nucleus proportionally small, and that this kind of embryo continues to increase without changing its form by the addition of new laminae on all the sides, so that the nucleus increases on its part, always preserving the same relation with the entire crystal.

We shall render this idea distinct by a construction which refers to the dodecahedron, and represented by a plane figure. What is said of this figure may easily be applied to a solid, since we can always conceive a plane figure to be a section made in a solid: let $s s'$, *Plate V. fig. 59*, A, be an assemblage of small squares, in which the square B N, D G, composed of forty-nine squares, represents a section of the nucleus, and the extreme square $l p i b f c s$, &c. the steps formed by the laminae of superposition. We may conceive that the assemblage commenced by the square B N, D G, and that different piles of small squares are afterwards applied on each of the sides of the central square; for instance, on the side B N, the five squares comprehended between f and b , afterwards the three squares contained between e and c , and then the square s . This progress corresponds with what would take place if the dodecahedron commenced with a cube proportioned to its volume, and which afterwards increased by an addition of laminae constantly decreasing.

But we may also suppose, that the assemblage of molecules commenced as represented *Plate V. fig. 59*, C, in which the square B N, D G, is only composed of nine molecules, and had on each side of it only a single square, $s t, s' z$. If we refer this assemblage in imagination to the solid, of which it is a section, we shall easily perceive that this solid had for its nucleus a cube composed of twenty-seven molecules, and that each face composed of nine squares had placed on the middle one a little cube, so that the decrement of one range is already seen in the initial dodecahedron.

By the addition of new squares, this assemblage will become that of B, *fig. 59*, in which the central square B N, D G, is formed of twenty-five small squares, and supports on each of its sides a range of three squares, besides the terminal squares $s t, s' z$. Here we have already two laminae of superposition instead of one only. Lastly, by a

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further application, the assemblage B, *fig. 59*, will be changed into that of A, *fig. 59*, where we have on each side three laminae of superposition. These different transitions, of which we may continue the series as far as we please, will convey an idea of the manner in which secondary crystals may increase in magnitude and still preserve their form, from which we may judge that the structure combines with this augmentation of volume in such a manner, that the law was already sketched in the nascent crystal, according to which the laminae of superposition successively decrease when the nucleus has attained its greatest dimensions.

The instrument by which the angles of crystals are measured is called a goniometer. For a description of Dr. Wollaston's reflecting goniometer, see GONIOMETER. A more simple instrument was employed by Häuy. (See *Plate VI. fig. 93. Crystallography.*) It consists of a semicircle of brass divided into degrees. At the centre is fixed a pin, upon which slide the two arms A B, G F. The last of these, by means of a screw, may be fixed in any position, so that the distance between the end G and the centre may correspond with the face of the crystal to be measured. The other arm A B is drawn up till the distance between B and the centre corresponds as nearly as possible with the size of the other face of the crystal. It is then turned round till the angle of the crystal to be measured corresponds exactly with the angle B C G; the arm A B then cuts the semicircle in the angle, which corresponds with that of the crystal. This instrument is found to be not sufficiently accurate for delicate observations, but it is truly surprising that Häuy was enabled by it to approximate so nearly to the correct measurement of the various crystals which he has described. The instrument for determining the electricity of crystals (*Plate VI. fig. 92.*) is described in the article MINERALOGY, *Addenda.*

On the Notation of Crystals.—To facilitate and abridge the description of the structure of secondary crystals, Häuy has invented symbols which denote the particular laws of decrement, that produce the various forms that may occur. This mode of notation will be easily understood by a reference to the figures in *Plates V. and VI. Crystallography.* Let *Plate V. fig. 64.* represent any oblique parallelepiped, the faces of which have angles of different measures; let it be the primitive form of some mineral, as felspar. The vowels are to represent the solid angles. The four first, A, E, I, O, are placed at the four angles of the upper base, following the order of the alphabet. The consonants are chosen to designate the edges. The six first are placed on the middle of the edges of the upper base, and upon the two longitudinal edges of the lateral faces, B, C, D, F, G, H. The letters P, M, T, which are the initials of the syllables of the word *Primitive*, are placed in the middle of the upper base, and of the two lateral planes or faces exhibited to view.

Each of the solid angles, or of the six edges marked by letters, is susceptible of undergoing particular laws of decrement, on account of the irregular form of the parallelepiped. For this reason, they are marked each with a different letter. But as the laws of decrement act with the greatest possible symmetry, every thing which takes place with respect to the angles and edges that undergo distinct decrements, takes place also on the angles and edges that are diametrically opposite, and are perfectly equal, but which are not visible, or are not marked. Thus in *fig. 66.* the edges A I, p s, A E, and p u, and the solid angles I and s, O and r, are equal. It is, therefore, only necessary to mark the number of solid angles or edges that have distinct decrements, because these are understood to include all those which take place on analogous edges or angles.

In some cases, it is necessary to indicate the analogous edges and angles; this is done by similar small letters: the angles analogous by A, E, I, O, are represented by *a, e, i, o*, and the same with the edges. But it is seldom necessary to mark these small letters in the figure; it is sufficient to introduce them into the symbol of the crystal, because the place which every one should occupy in the figure may easily be conceived.

To indicate the effects of decrements by one, two, three, or more ranges in breadth, the figures 1, 2, 3, 4, &c. are employed in a manner to be immediately explained; and to indicate the effects of decrements by two, three, &c. ranges in height, the fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, &c. are employed.

The three letters P, M, T, serve to distinguish either the form of the nucleus without any modification when they alone constitute the symbol of the crystal, or the faces parallel to those of the nucleus in the case where the decrements do not reach their limit; and then these letters are combined in the symbol of the crystal with those which relate to the angles or edges that have undergone decrements.

Let us suppose that one of the solid angles O, *fig. 64.* is intercepted by a single additional face. The decrement which produces this face may take place either on the upper base P, or on the plane T, which is on the left of the observer, or on the face M, which is on the right. In the first place, the figure marking the decrement is placed above the letter O; in the second case, the figure is placed on the left-hand, a little above the letter; and in the third case, it is placed on the right-hand. Thus O denotes the effect of a decrement by two ranges in breadth, parallel to the diagonal of the base P, that passes through I, E; O³ indicates the effect of a decrement by three ranges in breadth, parallel to the diagonal of the face M, which passes through the angle E; and O⁴ indicates the effect of a decrement by four ranges in breadth, parallel to the diagonal of the face T, that passes through the angle O.

When the decrement takes place on one of the three other solid angles I, A, E, the observer is supposed to move round the crystal till he is opposite to that angle, or to turn round the crystal till the solid angles E, A, I, are exactly opposite to him; and it is relative to that position that the decrement is said to take place to the right or the left.

For example, if we are speaking of the solid angle A, the figure ²A will represent a decrement by two ranges on the surface A E, *s r*, *fig. 66.* or opposite to T; and A³ will represent the effect of a decrement by three ranges upon the face A I *n r*, opposite to M.

As to the decrements on the edges, those which take place towards the boundary of the upper base B, C, F, D, are expressed by a letter placed above or below the letter as the effects occur above or below the terminal edge, supposing them to set off from the edge to which they are referred, whilst those which take place on the lateral edges are conducted by an exponent placed on the right or the left of the letter, according as they occur in one direction or the other.

Thus \dot{D} expresses a decrement by two ranges proceeding from D towards C: \hat{C} , a decrement by two ranges proceeding from C towards D: D, a decrement by two ranges descending upon the face M: H³, a decrement by three ranges, proceeding from H towards G: and G⁴, a decrement of four ranges proceeding from G towards the edge opposite to H, or A *r*, *fig. 66.* When it is necessary to denote by a small letter, such as *d*, a decrement upon the edge *u r*, *fig. 66.* opposite to the edge denoted by the capital letter D, *fig. 64.*

CRYSTALLOGRAPHY.

D, *fig.* 64, we must suppose the faces of the crystals reversed. Hence, $\overset{2}{D}$ will express a decrement by two ranges upon the other base ρ , just as $\overset{2}{D}$ expresses a similar decrement on the base P. For the same reason, c will express a decrement by three ranges proceeding from r u , to E O.

If the same solid angle, or the same edge, undergo several successive decrements on the same side, or different decrements which take place on different sides, the letter pointing out the angle or edge is repeated as often as the decrements, varying the figure each time, to make it correspond with the particular decrements denoted. Thus, $\overset{2}{D}$, $\overset{3}{D}$, will denote

two decrements upon the edge D, one of two ranges on the base P, and another of three ranges upon the face M; and $\overset{2}{H}$, H^4 , will denominate two decrements, one by two ranges on the left, the other by four on the right of the edge H.

Mixed decrements are marked according to the same principles, employing the fractions $\frac{2}{3}$, $\frac{3}{2}$, which represent them; the numerator referring to decrements in breadth, and the denominator to decrements in height.

The intermediate decrements are thus described. Let A E, I O, (*Plate V. fig.* 67.) be the same face as in *fig.* 66, but divided into rows or ranges; let us suppose a decrement by one range of double molecules, according to the lines parallel to αy ; so that O y measures the double length of a molecule, and O α that of a single molecule.

This kind of decrement is thus expressed, (O, D², F²;) the parenthesis indicates that the decrement is intermediate;

O, that it takes place by one range on the solid angle marked by that letter in *fig.* 64; D², that there is one length of a molecule taken away along the edge D; and F², that two lengths are taken away along the edge F.

The written language to denote the symbols, that they may be easily expressed when dictated, would be thus: for

O², ²O, read, O *two on the right*, O *three on the left*; $\overset{2}{O}$, O, read, O *under two*, O *above four*. And the symbol (O, D², F²;) read, in a parenthesis, O *under one*, D *one*, F *two*.

The order in which these letters must be placed to denote a secondary crystal remains to be explained. If the alphabetical order were adopted, there would result a degree of confusion in the picture which the formula presents. It is more natural to conform to the order that would direct an observer in the description of the crystal; that is, to begin with the prism or middle part, and to indicate its different faces as they present themselves successively to the eye; then to pass to the faces of the summit or the pyramid.

Suppose (*Plate VI. fig.* 68.) that variety of feldspar which Häuy calls binary, viz. where there are two decrements by two rows each. The primitive form is represented *figs.* 64 and 66. In this form of the crystal, the face I results from a decrement by two ranges on the edge G, *fig.* 64, going towards H; the face M, *fig.* 68, corresponds with M, *fig.* 64; the face T, *fig.* 68, is parallel to T, *fig.* 64; the pentagon α comes by a decrement of two ranges on the angle, corresponding with the angle I, *fig.* 64, and parallel to the diagonal A O. As this decrement does not reach its limit, the summit exhibits a second pentagon P, parallel to the base P, *fig.* 64. All this description may be exhibited by five letters in symbolic language: thus $\overset{2}{G}$ M T

$\overset{1}{I}$ P denoting a decrement by two ranges on the edge G, and a decrement by two ranges on the angle I, *fig.* 64.

It is customary, in order to prevent any ambiguity, to place under the different letters that compose the symbol those that correspond to them in the figure. Thus in the

binary feldspar, *fig.* 68. $\overset{2}{G}$ M T $\overset{1}{I}$ P
I M T α P the letters in the line

below those of the symbol enable us to compare the symbol with the figure, and thus to decipher the meaning with facility, however complicated it may be.

Where the primitive form has great simplicity, as in the cube and rectangular prism, when the opposite angles are equal, one letter will denote them both, and when the opposite edges are equiangular, the same letter will denote either; for every thing that denotes one of them, takes place also in the other. If, for instance, we suppose *fig.* 64, to become more symmetrical, and that certain solid angles which were before unequal are become equal, they should be marked with the same letter. If, for instance, the primitive form be a rectangular prism, which has oblique-angled parallelograms for its bases, one side of which is longer than the other, *fig.* 69; in this case, we have the angle O = A, I = E; we may substitute in each case the second letter for the first, as is done *fig.* 69.

If we review the different kinds of parallelograms we shall find them acquire different degrees of simplicity, which occasions new equalities in the angles and edges, and new substitutions of letters. The oblique prism with rhomboidal bases is represented *fig.* 70. The rectangular prism with rectangular bases *fig.* 71. The rectangular prism with rhomboidal faces *fig.* 72. The rectangular prism with square bases *fig.* 73.

The cube is represented *fig.* 74; here only the superior base is marked, because what takes place with respect to this may be applied indifferently to any of the other faces.

The same mode is employed in writing the symbols for these regular forms, only the letters that have the same name and the same figure are not repeated. An example will render this method evident. *Fig.* 75. represents the most common variety of the chrysoberyl, or cymophane, (see CHRYSOBERYL,) the nucleus of which is a rectangular parallelepiped, such as represented *fig.* 71. The symbol of the secondary crystal,

fig. 75, will be M T $\overset{2}{G}$ G² $\overset{1}{B}$ A $\overset{2}{3}$ A. This variety is called by Häuy annular cymophane.

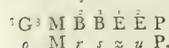
To understand this expression better, let us mark each angle and edge with a particular letter, as in *fig.* 76. In this case, the symbol would become M T $\overset{2}{G}$ H², B $\overset{1}{F}$ E $\overset{2}{3}$ O; but if we compare *fig.* 71. with 76, we shall see that H = G, F = B, O = A: hence if we substitute instead of their first letters their equal values, we get M T $\overset{2}{G}$ G² $\overset{1}{B}$ A $\overset{2}{3}$ A, which becomes the same as the one before given, when the useless repetition of B is suppressed.

From the preceding statement, it is evident that we must not confound such symbols as $\overset{2}{G}$ G² with G² $\overset{2}{G}$; the first symbol indicates the decrements which take place on the face T, *fig.* 71. and on the edge opposite to it, going from the edges G towards those that correspond with them behind the parallelepiped. The second symbol indicates the decrements which take place upon the face M, and which meet each other in the middle of that face. If these two decrements took place simultaneously, these symbols would be $\overset{2}{G}$ G².

CRYSTALLOGRAPHY.

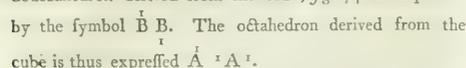
In the preceding symbols, each letter, such as on G^2 or 2G , can only be applied to a single edge situated to the right or left, as the letter is itself; but ${}^2G^2$ applies indifferently to the one edge or the other: hence it is needless to repeat the letter.

If we take *Plate VI. fig. 77.* as another example, and suppose *fig. 70.* to represent its primitive form, we shall have for the symbol of the variety of crystal here represented,



In this symbol, ${}^3C^3$ indicates two distinct faces formed on each side of each edge G , but it is not necessary to place two letters under that symbol, because all the faces situated in the same manner being distinguished by the same letter in the figure; it is sufficient to point out that the symbol ${}^3C^3$ applies to the faces marked with the letter \circ , and this requires only to write the letter \circ under the symbol.

From the same principles it follows, that the rhomboidal dodecahedron derived from the cube, *fig. 74.* is expressed



The rhomboid, supposing it placed in the most natural aspect, so that the two solid angles, composed of three similar plane angles, are in the same vertical line, has, properly speaking, no base, but merely summits, which are the extremities of its axis. Its angles and edges are marked as in *Plate VI. fig. 78.*

If all the lateral angles were indicated by letters, those that are nearest the summit A would have the letter E , and those which are nearest the inferior summit the letter e . As the rhomboid has six faces equal and similar, it is only necessary to consider the decrements relative to one of these faces; as, for example, that marked P , *fig. 78.* because all the others are mere repetitions of this. The decrements which set out from the superior angle A , or the superior edge B , will have the figure indicating the number of ranges placed below A and B . Those which set out from the lateral angles E , will have their figures situated at the side and towards the top of the letter. Those decrements which set out from the inferior angle e , or the inferior edge D , will have the figure placed above the letter e or D .

Suppose, for example, that *fig. 79.* represents the variety of calcareous spar, called analogie by Haüy, its symbol



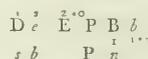
easy. What has been said of the rhomboid may be applied to the other primitive forms, of which we shall give examples: *fig. 80.* represents the octahedron with scalene triangles; *fig. 82.* the regular octahedron. In placing the figures that accompany the letters in the symbols in *fig. 80.* the figure denoting the decrement is placed below the letter A or B , to represent decrements setting out from the angle A , or the edge B . The figure is placed above for those which set out from the edge D , and at the side for those which set out from the angle E .

If we want to denote a decrement by one range upon all the angles of the regular octahedron, *fig. 82.* we have only to write $\overset{1}{A} A^1$. To indicate a decrement by one range on all the edges we write $\overset{1}{B} B$. The first of these decrements produces a cube, the second a rhomboidal dodecahedron. In some mineral species, as in the nitrate of potash, the primitive octahedron, which is composed of eight isos-

celes triangles, similar four and four to each, ought to have the position represented as in *fig. 83.*, that the secondary crystal may have the most natural attitude. The edges which join the two pyramids ought to have two of them a vertical direction, as F, F ; and two an horizontal direction, as B . By comparing *fig. 83.* with *fig. 84.* in which the letters are placed as if all the edges and angles had different functions, it will be easy to conceive the arrangement of the letters adopted in *fig. 83.*; for in the present case we have $E=A, D=B, G=F$.

The tetrahedron being always regular when it becomes a primitive form, it will be expressed as in *fig. 85.* and the decrements marked as in the octahedron.

In the regular six-sided prism, *fig. 86.* the figures are written precisely in the manner already described for the four-sided prism. But it happens sometimes, that three of the solid angles taken alternately are replaced by faces, whilst the intermediate angles remain untouched. In that case, the prism is distinguished as in *fig. 87.* In the rhomboidal dodecahedron, *fig. 88.* each solid angle composed of three planes may be allimated to a summit of the obtuse rhomboid: hence it is only necessary to give letters to one face, as may be seen in the *fig. A A, E E, B B, P*. Where the parts of crystals opposite to those which undergo certain decrements remain untouched, it is easy to mark this peculiarity by zeros. This case belongs chiefly to the tourmaline. One variety of the tourmaline is represented *fig. 90.* and the primitive form *fig. 89.* The prism, which is nine-sided, has six of its faces, namely ss , produced by the subtraction of one range upon the edges $D D$, *fig. 89.* and the three others, as l , by the subtraction of two ranges only on three angles e . The inferior summit has simply three faces parallel to those of the nucleus; while on the superior summit the three edges B , *fig. 89.* are replaced each by a facet nnn , *fig. 90.* in consequence of a decrement which has not reached its limit. This crystal is represented by the following symbol:



$\overset{2 \circ}{E}$ indicate, the one that the angles E , *fig. 89.* opposite to e , undergo no decrement; the other, that the edges parallel to B remain also untouched. If these edges underwent a different law of decrement, for instance, that which produced a subtraction by two ranges, the symbol would be, $\overset{1}{D} \overset{2 \circ}{e} \overset{2 \circ}{E} P B b$: hence it may be understood, that the

decrements represented by a capital letter, accompanied with a figure, do not always include similar decrements represented by a small letter of the same name. Thus B does not implicitly imply b , or *vice versa*; it is only when the second letter is not introduced into the symbol with a different figure, or a zero, that we imply that the same decrements take place on the analogous sides or angles.

In the symbol $\overset{1}{D} \overset{2}{e} \overset{2 \circ}{E} P B b$, by $\overset{1}{B}$ is implied a decrement by one range, which takes place only on the edges contiguous to the superior summit A , *fig. 89.* b indicates a decrement by two ranges, which only takes place on the edges contiguous to the inferior summit. The quantities $\overset{2}{e}$ and $\overset{2 \circ}{E}$ indicate two ranges on the angles e only, and that no decrement whatever takes place upon the opposite angles E .

The preceding illustrations of M. Haüy's mode of denoting the structure of crystals by symbols, are given in detail to enable the student to make a figure of a crystal from the symbol representing the laws of its formation. Shorter rules for enabling the student merely to read and understand this mode of notation will suffice.

1. The letters P, M, T, denote the faces of the nucleus or primitive crystal, or indicate that the faces are parallel to the faces of the primitive crystal marked with the same letters.

2. Every vowel in the symbol indicates a solid angle, marked with the same letter as in the nucleus. Every consonant indicates the edge which has the same letter in the figure.

3. Each letter contained in the symbol is understood with the figure belonging to it to represent all the same letters, and the angles or edges which have the same function.

4. Every number joined to a letter indicates a decrement setting out from the angle or the edge denoted by that letter. If the number be a whole one, it indicates the ranges in breadth, supposing each plate to have only the thickness of one molecule. If the number be a fraction, the numerator indicates the number of ranges subtracted in breadth, and the denominator the number of ranges subtracted in height.

5. The number is placed above the letter to shew that the decrement ascends, or below it to shew that it descends, setting out from the angle or edge marked by the letter. If it be placed either on the right or left hand of the letter, it indicates a decrement to the right or left of the edge or angle marked by the letter.

6. When a letter is twice repeated with the same number placed on different sides, as ${}^2G^2G^2$ or $G^2{}^2G^2$, ${}^2A^2A^2$ or $A^2{}^2A^2$, the two edges or two angles which it marks should be considered in the figure in the same relative positions. Thus, ${}^2G^2G^2$ indicates the effect of decrement by two ranges on the edge G situated at the left, and of a similar decrement on the edge G situated at the right.

7. When a letter has the same number both on the right and left side, as ${}^3G^3$, it applies equally to all the edges G. The same applies to the letters which denote the angles.

8. The parenthesis, as, for example, $(\overset{\circ}{O}D^1, F^2)$ indi-

cates an intermediate decrement. The letter $\overset{\circ}{O}$ indicates, that an ascending decrement of three ranges takes place on the angle O; D^1 , that one molecule is subtracted along the edge D; and F^2 , that two molecules are subtracted on the edge F.

9. Every small letter in the symbol indicates the angle or the edge diametrically opposite to that which has the same capital letter in the figure, where the small letter is omitted as superfluous. The letter *e* is, however, never omitted in the rhomboid; it indicates, according to the principle, the letter opposite to E.

10. When the large and small letters of the same name are introduced into the symbol with different numbers attached to them, the two opposite edges or angles denoted by these letters are conceived to undergo exclusively the law of decrement, indicated by the number attached to the letter.

11. Every letter, whether large or small, marked by a number having a zero attached to it, as $\overset{\circ}{E}$, indicates that the decrement denoted by that number does not take place on the angle or edge which the letter represents.

The above account of the theory of crystallization, and the notation of crystals, may suffice with what has been before given under the article CRYSTAL, to convey ample information of the abbé Haüy's ingenious system, so far as

relates to the structure of crystals, and the symbolic mode of describing the decrements by which the secondary crystals are formed. The figures in Plates II. III. IV. V. VI. *Crystallography*, which we have described, are copied from Haüy's *Traité de Minéralogie*, tom. i., and contain what he has given in illustration of the 'theory of crystallization.' The application of geometry and analysis, to determine the laws of decrement from the measurement of the angles, which has been so ably made in the above-named work by this illustrious crystallographer, would require for its explanation a more ample space than would be consistent with the present article, which is intended to supply what was defective in the explanation of the plates under the article CRYSTAL, and to correct the references that were there erroneously given. (See CRYSTAL.) We omitted to state, that Plate II. fig. 25, represents the secondary rhomb, fig. 24, with the three superior edges, and the three inferior ones cut off or truncated r, r, r, r', r', r' ; by cutting other laminae parallel to each of the faces r, r, r , &c. we shall at length extract the primitive nucleus A E, O I, fig. 24.

CSHATRIYA, or CHATTERIE, denotes in India a man of the second or military cast. See CAST.

CUCKFIELD. In 1811, the parish of Cuckfield contained 300 houses, and 2088 persons; viz. 1063 males, and 1025 females: 251 families being employed in agriculture, and 123 in trade, &c.

CUCKOW-SPIT. Add—This cuckow-spittle encompasses the larva of a species of cicada, which is denominated *C. ipumaria*, or cuckow-spit cicada, from the circumstance of its larva being constantly found enveloped in a mass of white froth adhering to the leaves and stems of vegetables. This froth, called cuckow-spittle, is found during the advanced state of summer, and is the production of the included larva, which, from the time of its hatching from the egg deposited by the parent insect, continues occasionally to suck the juices of the stem on which it resides, and to discharge them from its vent in the form of very minute bubbles, till it covers itself with a large mass of froth, and it is sometimes so overcharged with moisture that a drop may be seen hanging from its under surface. Shaw's Zoology, vol. vi.

CUCULUS, l. 4, add—Dr. Leach, however, observes, that this property does not belong to this kind of feet, which can be considered merely as simple feet, having two toes before and two behind. Col. 2, l. 21, after insects, add—and on larvae or caterpillars; l. 35, add—For the natural history of this bird, see Dr. Jenner's curious paper in the Phil. Trans. for 1788, pt. ii.

CUD-BEAR. See LICHEN *Tartareus*.

CULLUMIA, in Botany, dedicated by Mr. Brown, to the honour of the late sir John Cullum, bart., an elegant and accomplished scholar and botanist; as well as of his brother the present sir Thomas Gery Cullum, bart. F.L.S. an excellent British botanist, one of the most ardent cultivators of this lovely science, whose friendship alone can be more valued than his various and extensive information.—Br. in Ait. Hort. Kew. v. 5, 137.—Class and order, *Polygamia-frustranea*. Nat. Ord. *Compositæ*, Linn. *Corymbiferae*, Juss. Eff. Ch. Receptacle cellular. Seeds smooth. Down none. Common calyx of one leaf, covered with imbricated scales.

1. *C. ciliaris*. Fringed Cullumia. Ait. n. 1. (*Berkheya ciliaris*; Willd. Sp. Pl. v. 3, 2273; *Gorteria ciliaris*; Linn. Sp. Pl. 1284. *Carlina foliis imbricatis*, &c.; 151, t. 54 f. 1.)—Leaves ovate, smooth, imbricated, fringed with a double row of bristles, and tipped with a reflexed spine.

2. *C. fetosa*. Recurved smooth-leaved Cullumia. Ait. n. 2. (*Berkheya fetosa*; Willd. *ibid.* excluding *Comme-*
lin's

fin's syn.)—Leaves ovato-lanceolate, smooth, recurved, fringed with prickles.

3. *C. squarrosa*. Recurved awl-leaved *Callumia*. Ait. n. 3. (*Berkheya squarrosa*; Willd. 2272. "Rohria squarrosa"; Thunb. in *Act. Soc. Nat. Scrut. Hafn.* v. 3, part 1. 100. t. 5.")—Leaves awl-shaped, recurved or spreading, fringed with prickles; furrowed beneath; nearly smooth like the branches.

These are green-house shrubs, with yellow radiant flowers; all natives of the Cape of Good Hope.

CULLUMPTON. By the return of 1811, the parish contains 600 houses, and 2917 inhabitants.

CULPEPPER, l. 3, r. 1810, 18,967, and 8312.

CULROSS. In 1811, the burgh and parish contained 279 houses, and 1611 persons; viz. 725 males, and 886 females; 78 families being employed in agriculture, and 183 in trade, manufactures, and handicraft.

CUMANA, l. 4, r. Welbes.

CUMBERLAND, l. 23, r. and by the return of 1811, 24,002 houses, and 133,344 inhabitants.

CUMBERLAND, in Maine, l. 7, r. 24 townships; l. 9, r. 1810, is 42,831.

CUMBERLAND, in New Jersey, l. 5, r. 12,678, and 42.

CUMBERLAND, a county of Pennsylvania, l. ult. r. 26,757, and 307.

CUMBERLAND, a county of Virginia, l. 3 and 4, r. 9992, and 6102.

CUMBERLAND, a county of N. Carolina, l. 2, r. 9382, and 2796.

CUMBERLAND, a county of Kentucky, l. 1 and 2, r. 6085, and 902.

CUMBERLAND, in Rhode Island, l. 2, r. 2140.

CUMBERLAND, in Pennsylvania, r. 1591. And at the close, after Bedford, add—containing 570 inhabitants.

CUMMINGTON, l. 3, r. 1009.

CURCULIO, l. 17, add—Mr. Marsham, in his "Entomologia Britannica," enumerates no fewer than 234 British species; l. 27, add—The larva, when properly fried and boiled, is considered as one of the best dainties in the West Indies. P. 3, C. GRANARIUS, add—See WEEVIL. P. 5, col. 2, NUCUM, add—The various changes which the nut-maggot passes through, from its introduction into the nut in August to its escape, are worthy of attention. Dr. Darwin, in his "Botanical Garden," thus beautifully describes the egress of this insect from the cavity of the nut:

"So sleeps in silence the curculio, shut
In the dark chambers of the cavern'd nut;
Erodes with ivory beak the vaulted shell,
And quits on filmy wings its narrow cell."

CURD, *Chemical Properties of*. See MILK.

CURIA CLAUDENDA, a writ that lies against him who should fence and inclose the ground, but refuses or defers to do it.

CURIA Advolare vult, a deliberation which the court sometimes takes, before judgment is given in a cause, with regard to which there seems to be any point of difficulty.

CURRIE, JAMES, M.D., in *Biography*, distinguished both as a physician and a writer, was the son of an established minister at Kirkpatrick-Fleming, in Dumfriesshire, in which parish he was born in the year 1756. Originally designed for commerce, he was educated with that view; but upon a change of his destination, he commenced, in 1776, a course of medical study at Edinburgh; and having graduated in that university, settled, in 1781, at Liverpool, where he soon rose to eminence in his profession and in his literary character. His first performance as a writer was an

elegant tribute to the memory of his intimate friend, Dr. Bell of Manchester, published in 1785 in the first volume of the Manchester Transactions. His paper on Tetanus, &c. was published in the Memoirs of the London Medical Society, vol. iii. In 1792 he was elected a member of the Royal Society; and his curious paper on the lamentable effects of a shipwreck was printed in the Phil. Transf. for that year. Disapproving of the war between this country and France in consequence of the revolution, he was supposed to be the author of an interesting pamphlet, which appeared in 1793 under the title of "A Letter, Commercial and Political, addressed to the Right Honourable William Pitt, by Jasper Wilson." In 1797 his medical reputation was much advanced by a treatise in 8vo., entitled "Medical Reports on the Effects of Water, cold and warm, as a Remedy in Febrile Diseases, &c." by which the practice of effusion of cold water in fevers, suggested by Dr. Wright's narrative in the London Journal, was much extended. With a view to the relief of the distressed family of the rustic poet, Robert Burns, with whom he became acquainted in 1792, he published in 1800 an edition of his works, with an account of his life, &c. in 4 vols. 8vo. It is with real regret we farther report, that Dr. Currie's health began to decline in 1804, and that his friends and patients at Liverpool were deprived of the pleasure of his society and advice by his removal, towards the close of the year, to Clifton and Bath. His disorder, which was of the pulmonary kind, somewhat abated in consequence of the change of his situation, and at the commencement of the following year he began to practise in his profession with encouraging prospects of success. But it again recurred with alarming symptoms, and he was under a necessity of removing to Sidmouth, where his valuable life terminated on the 31st of August, 1805, in the 50th year of his age. The cause of literature and science, and the interests of humanity and benevolence, suffered great loss by his death.

CURVO, in *Geography*, a township of America, in the district of Maine, and county of Somerset, containing 275 inhabitants.

CUSERUND, a town of Mekran in Persia, situated in a fertile valley, about 21 miles broad, with a river running through it. It contains 500 huts, and a large mud fort. Wheat, rice, and dates, are abundant; and the town belongs to an independent chief, whose revenue is about 1000 rupees a year.

CUSHING, l. 3, r. 532.

CUTIS, *Chemical Properties of*. See INTEGUMENTS.

CYANOGEN, in *Chemistry*, the name given by M. Gay Lussac to the recently-discovered basis of the prussic acid, and which he has demonstrated to be a compound of carbon and azote. The name is derived from *κyanos*, blue. Cyanogen may be obtained by exposing dry prussiate of mercury in a small retort, to a heat rather under redness. The salt blackens, and a gaseous fluid is extracted in abundance, which must be collected over mercury. This gas is cyanogen. It is colourless, and possesses the mechanical properties of common air. Its smell is quite peculiar, and very strong and disagreeable. Its specific gravity, as ascertained by Gay Lussac, is 1.8064. It is inflammable, and burns with a purplish-blue flame. It is not decomposed by exposure to a red heat. Water dissolves $4\frac{1}{2}$ times its volume, and alcohol 23 times its volume of this gas. It reddens tincture of litmus. Phosphorus, sulphur, and iodine, may be volatilized in it without alteration. Potassium burns in it, and absorbs it. For complete combustion, it requires twice its volume of oxygen gas; and the products are twice its volume of carbonic acid, and its own volume of azotic gas. Hence it is obviously

CYANOGEN.

obviously composed of two atoms or volumes of carbon, and one atom or volume of azote, or *per cent.* of

Carbon	-	-	-	70.0
Azote	-	-	-	30.0
				100.0

See *Atomic Theory*, Table III.

Cyanogen is capable of combining with chlorine, and forming an acid which has been named *chlorocyanic acid*. It also combines with hydrogen, forming *hydrocyanic acid*; with sulphur, forming *sulphocyanic acid*; and with iron, forming *ferrrocyanic acid*: of each of which acids we shall here give a brief account.

Chlorocyanic Acid.—This is the *oxyprussic acid* of Berthollet, who first demonstrated its existence. Its properties were afterwards more thoroughly investigated, and its true composition pointed out by M. Gay Lussac, who gave it the above name. The acid was formed by M. Gay Lussac by passing a current of chlorine gas through a solution of hydrocyanic acid (prussic acid, see below) in water, till the liquid discoloured indigo dissolved in sulphuric acid. To separate the excess of chlorine, the mixture was agitated with mercury. The chlorocyanic acid was subsequently separated by an ingenious process. A glass cylinder, filled two-thirds with mercury, was filled to the brim with the above mixture, and then inverted into a basin of mercury. The apparatus was put under the receiver of an air-pump, and the exhaustion carried on till the whole of the mercury and liquid was displaced, and the cylinder filled with chlorocyanic acid, in a state of vapour. On letting the air again into the receiver the vapour was condensed into a liquid, and thus collected upon the surface of the mercury in the cylinder. Chlorocyanic acid thus obtained is a colourless liquid, having a strong and peculiar odour, which excites such irritation as to induce a flow of tears. It reddens litmus, is not inflammable, and does not detonate when mixed with hydrogen or oxygen. Its solution in water does not precipitate nitrate of silver, nor barytes water. The alkalis absorb it rapidly, but it requires an excess of them to destroy its odour completely. It throws down iron from its solution of a green colour. But some of its compounds appear of a very permanent nature. Gay Lussac has shewn that this acid is a compound of one atom or volume of cyanogen, and one atom or volume of chlorine, united together without change of bulk. Hence it will be composed *per cent.* of

Cyanogen	-	-	-	41.93
Chlorine	-	-	-	58.07
				100.00

And its specific gravity in a state of vapour will be 2.152.

Hydrocyanic Acid.—This was formerly denominated *Prussic Acid*; which see. Hydrocyanic acid may be prepared in the manner pointed out in the above article; but the method more lately recommended by Gay Lussac consists in decomposing the prussiate of mercury by means of muriatic acid in a retort with heat. The products are to be passed through a tube two feet long, the first one-third of whose length is to be filled with fragments of marble, to retain the muriatic acid that may come over, and the remaining two-thirds with dry muriate of lime. A small receiver covered with ice is to be adapted to the end of this tube in which the hydrocyanic acid may be collected on application of a moderate heat to the retort. The properties of this acid are correctly described under *Prussic Acid*. It is a most

virulent poison. From Gay Lussac's experiments, it appears to be composed of one atom or volume of cyanogen, and one atom or volume of hydrogen, united together without condensation. Hence it is composed *per cent.* of

Cyanogen	-	-	-	96.3
Hydrogen	-	-	-	3.7
				100.0

And the specific gravity of its vapour will be .9367.

Hydrocyanic acid cannot be preferred for any length of time without undergoing decomposition, ammonia is formed, and a quantity of charry matter is deposited. Iodine volatilized in this acid suffers no change. Oxygen decomposing it with combustion. Chlorine displaces the hydrogen, and forms chlorocyanic acid. Neither azote, hydrogen, carbon, boron, silica, nor phosphorus, have any known action upon it. Sulphur decomposes it, appearing to displace the hydrogen and combine with the cyanogen, and thus forming sulphocyanic acid. Potassium, sodium, potash, soda, and barytes, combine with the cyanogen and liberate the hydrogen. The vapour of hydrocyanic acid is decomposed when passed through red-hot iron or platinum; also when passed through the peroxid of copper. The peroxid of manganese completely absorbs the vapour of hydrocyanic acid in a few hours, water is formed, but cyanogen is not evolved. When the red oxid of mercury is heated in hydrocyanic acid vapour, so much heat is evolved from the violent action that takes place that the compound is destroyed. If heat be not applied, the vapour is absorbed by the oxid, and when the compound is afterwards submitted to heat, water is disengaged, and the cyanide, or *prussiate* of mercury, as it was formerly termed, is left behind. See further under *Prussic Acid*.

Sulphocyanic Acid.—This is the *sulphuretted cyanic acid* of Mr. Porrett, who discovered it in 1808. It may be formed by dissolving one part of sulphuret of potash in water, and boiling in this solution three or four parts of prussian blue, added at intervals. Sulphuret of iron is formed, and a colourless neutral liquid containing a considerable quantity of sulphocyanic acid combined with potash. This liquid is then to be rendered decidedly acid by sulphuric acid, and the mixture kept at the boiling point for some time. When cold, a little peroxid of manganese is to be added, which will give to the solution a fine crimson colour. This crimson liquid is to be filtered, and a solution composed of two parts of the persulphate of copper and three of the protosulphate of iron is to be added, till the crimson colour disappears. A copious white precipitate, composed of sulphocyanic acid and protoxyd of copper, takes place. The copper may be separated by boiling with a solution of potash, and the sulphocyanate of potash thus formed afterwards decomposed by sulphuric acid; the sulphocyanic acid may be then obtained by distillation in a retort. If any sulphuric acid adheres to it, this is to be separated by a little carbonate of barytes.

Sulphocyanic acid thus formed is a transparent colourless liquid, having an odour as strong, and somewhat resembling acetic acid. Its specific gravity when most concentrated was 1.022. According to Mr. Porrett's analysis, it is composed of

Sulphur	-	-	-	65.2
Hydrocyanic acid	-	-	-	34.8
				100.0

Dr. Thomson seems inclined to consider this acid as composed

posed of cyanogen and sulphur, but it is probable that Mr. Porrett's view of its composition will be hereafter found correct.

The *sulphocyanates* of potash, soda, ammonia, barytes, strontian, lime, and magnesia, are all deliquescent salts soluble in alcohol. The sulphocyanate of soda, lime, barytes, and strontian, are capable of crystallizing, the others are not. The sulphocyanate of alumina is not deliquescent, and readily crystallizes. The sulphocyanate of the protoxyd of iron is colourless, and very soluble. The sulphocyanate of the peroxyd of this metal is of a beautiful crimson colour, deliquescent, and does not crystallize, and this is one of the most striking characteristics of this acid. The sulphocyanate of the peroxyd of copper is a white powder insoluble in water and most acids. The other salts are not remarkable, and consequently possess little interest. The following is a short account of some of the salts formed by this acid.

Ferrocyanic Acid; the Ferruretted Chyazic Acid of Mr. Porrett its Discoverer.—This is the acid which combines with different bases, and forms what were formerly denominated *triple prussiates*, iron being supposed to form part of their base, whereas Mr. Porrett has demonstrated that this metal forms a constituent of the acid itself. This acid may be obtained by the following simple process:—Dissolve in cold water any quantity of the *triple prussiate of barytes*, and for every ten grains of the salt add about 2.5 grains of real sulphuric acid, agitate the mixture and let it aside some time. The barytes will be precipitated in union with the sulphuric acid, and leave the ferrocyanic acid in solution in the water. When obtained, it has a pale lemon colour, and is destitute of smell. It is decomposed by a gentle heat and exposure to a strong light, hydrocyanic acid being formed, and the white triple prussiate of iron deposited. When combined with the different bases, it forms at once the salts formerly termed triple prussiates. It displaces acetic acid from all its combinations without heat, and displaces all other acids when it forms insoluble compounds with the bases to which they were united. Mr. Porrett, from his analysis, concludes that this acid is composed of

Hydrocyanic acid	-	-	63.79
Black oxyd of iron	-	-	36.21
			<hr/>
			100.00

Dr. Thomson, however, from analogy, is disposed to consider it as a compound of cyanogen and iron, but it is probable that Mr. Porrett's view is more correct. Most of the *ferrocyanates* have been already described under the different bases, by the old name of the *triple prussiates*. For the most important of these, or the *triple prussiate of iron*, see IRON and PRUSSIAN BLUE.

CYATHODES, in *Botany*, *κυαθόδες*, cup-like, alluding to the shape of the nectary.—Labill. Nov. Holl. v. 1. 57. Brown Prodr. Nov. Holl. v. 1. 539.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Epacrideae*, Br.

Eff. Ch. Calyx five-cleft, with numerous scales at the base. Corolla funnel-shaped; tube scarcely longer than the calyx, naked and smooth within; limb spreading. Filaments within the tube. Drupa pulpy. Nut with five or ten cells.

Stem shrubby, erect, branched, sometimes almost arborescent. *Leaves* striated at the back. *Flowers* axillary, erect, or slightly drooping, small. *Nectary* a five-toothed cup-shaped disk, beneath the *germen*.

Mr. Brown differs from Labillardiere in his ideas of the species which properly belong to this genus. He defines

six New Holland species. 1. *C. glauca*, Labill. t. 81; 2. *C. straminea*; 3. *C. dealbata*. All these have some degree of hairiness on the corolla. 4. *C. parvifolia*; and 5. *C. oxycedrus*, (*Styphelia oxycedrus*, Labill. t. 69.); and 6. *C. abietina*, (*Styphelia abietina*, Labill. t. 68.). These have a smooth corolla. *Ardisia acerofa*, Gært. t. 94, belongs to this second section, and Mr. Brown has seen three South-sea species in Sir Joseph Banks's herbarium.

The present genus stands between MELICHRUS and LISANTHUS; see those articles.

CYATHUS, *κυαθός*, a cup, Perf. Syn. Fung. 236, a genus of rather small *Fungi*, to which some botanists have given a still more expressive name, *Nidularia*, (see Sowerb. Fung. t. 29.) The whole plant consists of a leathery cup, containing several lenticular bodies, supposed to contain the seeds, and all together resembling a bird's nest with eggs. Perfoon has seven species.

CYCLOPIA, from *κύκλος*, a circle, and *πούς*, a foot, because of the circular fold round the stalk of the legume—Venten. Dec. Gen. Nov. 8. Brown in Ait. Hort. Kew. v. 3. 5. (Ibbetsonia; Sims in Curt. Mag. 1259.)—Class and order, *Decandria Monogynia*. Nat. Ord. *Papilionaceae*, Linn. *Leguminosae*, Juss.

Eff. Ch. Calyx five-cleft, unequal; intruded at the base. Corolla papilionaceous; standard furrowed lengthwise; wings with a transverse plait. Stamens deciduous. Stigma bearded at one side. Legume compressed, with many seeds.

1. *C. genifloides*. Narrow-leaved Cyclopia. Ait. n. 1. (*Sophora genifloides*; Linn. Sp. Pl. 534. *Podalyria genifloides*; Willd. Sp. Pl. v. 2. 502. *Ibbetsonia genifloides*; Curt. Mag. t. 1259. *Gompholobium maculatum*; Andr. Repof. t. 427.)—Leaflets awl-shaped, pointless as well as the calyx. Bractes oblong-ovate, shorter than the flower-stalks. Young branches smooth.—Native of the Cape of Good Hope. A bushy shrub, densely clothed with ternate, sessile, narrow, smooth leaves. The flowers are axillary, large, yellow, with crimson streaks at the base of the standard.

Of the remaining species we have no account.

CYNODON, from *κύνες*, a dog, and *όδον*, a tooth, a genus founded by some authors on the *Panicum Dactylon* of Linnæus, a grass known in most of the temperate or warm parts of the globe, to which Mr. Brown adds two tropical New Holland species. See his Prodr. v. 1. 187. This genus is closely related to the *Chloris* of Swartz. See PANICUM, at the end of sect. 1. of that article.

CYNTHEANA, in *Geography*, a town of Kentucky, in Harrison county, containing 369 inhabitants, of whom 116 are slaves.

CYRTOSTYLIS, in *Botany*, from *κύρτος*, curved, or convex, and *στυλός*, the style, or column.—Brown Prodr. Nov. Holl. v. 1. 322.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideae*.

Eff. Ch. Calyx ringent, pointless. Petals spreading, nearly equal to the lower calyx-leaves. Lip difformal, direct, flat, obtuse, undivided, with two callosities at the base. Anther a terminal permanent lid; the cells close together. Masses of pollen two in each cell, powdery, compressed.

1. *C. reniformis*.—Gathered by Mr. Brown, at Port Jackson, New South Wales. Habit like *ACIANTHUS*, (see that article,) to which this plant is perhaps too near akin. Leaf kidney-shaped, many-ribbed. Flowers generally turned, or, in one sense, reversed. *MALAXIS liliifolia* (see that article, n. 11.) is thought by Mr. Brown to approach this plant in structure of flowers, though different in habit. We have already observed how imperfectly that species, with our *Cordifolia* and *Loeflii*, answer to *Malaxis*.

CY Stantonhe,

CYSTANTHE, from *κύστις*, a bladder, and *άνθος*, a flower, expressing the appearance of the corolla.—Brown Prodr. Nov. Holl. v. 1. 555.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Epacridæ*, Br.

Eff. Ch. Calyx leafy. Corolla closed, like a lid, splitting transversely; the torn base permanent. Stamens inserted into the receptacle, permanent. Nectariferous scales none. Capsule with many seeds; receptacles pendulous from the top of the central column.

1. *C. Sprengeliana*.—Native of Van Diemen's island. A shrub, resembling *Sprengelia*, *Ponceletia*, and *Cosmelia*, except the branches being marked with annular scars after the fall of the leaves. A short-leaved variety grows on the mountain tops, but on their shady sides the plant bears more elongated, spreading, recurved leaves.

CYSTITIS. Inflammation of the bladder is rarely a primary disease, but generally comes on as a consequence of some other affection in the neighbouring parts; or of lithotomy, accidental injuries, &c. The symptoms attending it

are, tension and pain over the pubes, with a frequent desire to make water, difficulty in voiding it, or a total retention, with tenefimus and fever.

The treatment recommended for **NEPHRITIS** is here also applicable. In particular, venesection, leeches to the hypogastric region, the warm bath, aperient medicines, and emollient clysters, must be employed. When the bladder and peritonæum inflame after wounds, or the surgical operation of lithotomy, blisters are often of great service; but bleeding should be first practised. In chronic inflammation and thickening of the bladder, the symptoms and pain may be allayed with anodyne emollient clysters, which are far better than injections into that organ itself. Opium, cicuta, hyocyamus, the uva ursi, &c. with a perpetual blister, may also be tried.

CYSTOTOMY, **CYSTOTOMIA**, from *κύστις*, the bladder, and *τομή*, to cut, the operation of cutting into the bladder. See **LITHOTOMY**.

D.

VOL. XI.

DAGESTAN, 1. 2, after Asia, insert—almost entirely mountainous, as its name implies.

DAGOTI. See **GAUTHIER**.

DALIBARDA, in *Botany*, a genus originally dedicated by Kalm and Linnæus to M. Dalibard, author of the *Flore Parisiensis Prodrômus*, classed in the Linnean method.—Linn. Gen. ed. 5. 217. Sp. Pl. ed. 1. 491.—It was afterwards reduced to *Rubus*, but is since restored by Michaux and others. (See the two species under *RUBUS*, n. 54 and 55.) The specific names of Michaux are inadmissible, for several reasons.

DALTON, col. 2, l. 15, after government, *dele* to houses in l. 18, and insert—in 1811, the parish of Dalton in Furness contained four townships; *viz.* Dalton having 156 houses, and 643 inhabitants; Hawcoat having 107 houses, and 583 inhabitants; Irelech with 75 houses, and 445 inhabitants; and Yarlside with 68 houses, and 403 inhabitants.

DALTON, in America, l. 3, r. 779; l. 7, for Grafton r. Coos; l. 8, for 62 r. 235.

DALTONIA, in *Botany*, so named in just commemoration of the Rev. James Dalton, F.L.S., an eminent British botanist.—Hook. and Tayl. Musc. Brit. 80. t. 3.—However desirous we may be to admit this genus, it affords a fresh proof in support of the opinion we have always maintained, that the inner fringes of Mosses give, in general, no found generic characters. Nothing can be less exclusively allied than the two supposed species, either in habit or character. They are, *Neckera splanchnoides*, Engl. Bot. t. 2564; and *N. heteromalla*, Hedw. Crypt. v. 3. t. 15. Engl. Bot. t. 1180. The teeth of their inner fringes, it seems, want the slight connecting base, more or less visible

in several species of **NECKERA** (see that article), and are attached, scarce visibly, to the teeth of the outer fringe.

DAMASONIUM, Schreb. Gen. 242. Willd. Sp. Pl. v. 2. 276. Ait. Hort. Kew. v. 2. 331. Brown Prodr. Nov. Holl. v. 1. 344. See **STRATIOTES**, n. 4.

DAMGAN. See **SUMNUM**.

DAMPIERA, in *Botany*, dedicated by Mr. Brown, to the memory of William Dampier, the famous navigator, who first brought one of the species, *D. incana*, Br. n. 7, from the west coast of New Holland, along with several other specimens preserved at Oxford, the earliest botanical tribute from that remote country.—Br. Prodr. Nov. Holl. v. 1. 587.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Goodeniæ*, Br.

Eff. Ch. Corolla two-lipped; tube split at one side; segments of the upper lip auricled at their inner margin. Anthers closely combined. Cover of the stigma naked at the edge. Nut inferior, cruciateous, with a solitary kernel. Dry, downy, perennial herbs, or shrubs, with undivided, alternate, often toothed, coriaceous leaves. Flowers blue or purple. Calyx small, or none. Stamens permanent, sheathing the style.

Thirteen species, from various parts of New Holland, are described, among which is *D. stricta*, *Goodenia stricta*; Sm. Tr. of L. Soc. v. 2. 349. Willd. Sp. Pl. v. 1. 955.

DANA. Add—containing 625 persons.

DANBURY, l. 3, r. 345; l. 8, r. 3606.

DANBY, l. 2, r. 1730.

DANTHONIA, in *Botany*, so named by M. De Candolle, after M. Danthon, a French botanist, is a genus separated by that eminent writer, in his *Flore Française*, v. 3. 32, from *Avena*, on account of the three awns to the outer valve of the corolla, and, as far as we can perceive, for no other reason. He is however followed by Mr. Brown,

Prodr. Nov. Holl. v. 1. 176, who defines eight New Holland species, and mentions having gathered ten or more in Southern Africa; but with a hint that this genus is too near to *Avena*, which it almost entirely resembles. The *avena* being acknowledged very treacherous in grasses, we would presume to offer another hint, that ANISPOGON (we wish to say nothing of DIPLOPOGON and AMPHIPOGON, see those articles,) may possibly require revision.

DANVERS, l. ult. r. 3127.

DANVILLE, l. 6, r. 432 and 166; l. 9, r. 2240.

DAOURIAN. See NERTSKINSKOI.

DARABGERD. Add—Although a great part be in ruins, it is said to contain between 15,000 and 20,000 inhabitants. It is beautifully situated on an extensive plain, and surrounded with groves of orange and almond trees, the juice of which is exported to every part of Persia. Its tobacco is highly esteemed for its mildness.

DARBY. Add—The former containing 966, and the latter 1085 inhabitants.

DARIEN. Add—It contains 107 inhabitants, of whom 10 are slaves.

DARK-RAYS, l. 17, r. see HEAT and RAYS of Heat.

DARLINGTON, l. 6 from bottom, after Darlington, infert—ward, consisting of three divisions, contained 7184 houses, and 39,001 persons; 18,725 being males, and 20,276 females: and the township of Darlington contained 818 houses, and 5059 persons; 2351 being males, and 2708 females.

DARLINGTON, in Carolina. Add—It contained, in 1810, 9047 inhabitants, of whom 2731 are slaves.

DARRYFIELD. Add—See DEERFIELD.

DARTAN, in *Rural Economy*, a kind of scabs or ulcers to which lambs are subject, and which extending to the mouth often prove fatal. The remedy proposed is washing the sores with vinegar, and applying a salve made with equal parts of tar and hog's-lard.

DARTFORD, col. 1, l. ult. r. 1811; col. 2, l. 1, r. 526 and 3177.

DARTMOUTH, l. 31, after houses, infert—in the parishes of St. Petrox, St. Saviour, and Townhall, which form the borough of Clifton Dartmouth Hardness, was 364 houses, and that of inhabitants 3595.

DARTMOUTH, in America, l. 9, for 2660 r. 3219.

DARWINIA, in *Botany*, in memory of the late ERASMUS DARWIN, M.D. the elegant poet, and ingenious botanical physiologist; see that article.—Rudge Tr. of Linn. Soc. v. 11. 299.—Clafs and order, *Decandria Monogynia*. Nat. Ord. . . .

Eff. Ch. Calyx none. Corolla tubular, funnel-shaped, tumid, with five marginal imbricated segments. Stamens concealed, inserted in two rows into the throat. Anthers kidney-shaped. Germen somewhat oblique. Style prominent. Stigma simple.

1. *D. fascicularis*. Ibid. t. 22.—Found in New South Wales, by Sir Joseph Banks and Dr. Solander. A branched shrub, with crowded needle-like leaves, and terminal dense tufts, of elegant, small, red flowers.

DASYPOGON, from *dasyus*, thick and bristly, and *πωγων*, a beard.—Brown Prodr. Nov. Holl. v. 1. 263.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Juncea*? Br.

Eff. Ch. Calyx inferior, tubular, three-cleft. Petals three, with long claws, connected with the filaments. Anthers incumbent. Stigma simple. Capsule of one cell, not bursting, invelted with the hardened calyx.

1. *D. bromeliifolius*. Br. n. 1. Terr. Austr. 76. t. 8.—Found on the shores of King George's sound, New Holland. Herb one and a half or two feet high, somewhat shrubby,

with rigid, simple, sharply and finely toothed leaves. Flowers in a dense, globular, brittle head. The figure seems to exhibit three seeds.

DATOLITE. See MINERALOGY, *Addenda*.

DAVENTRY, l. 2, r. Fawley; l. 4 and 5, infert—51 Geo. III., 534 houses, and 2758 inhabitants.

DAVID'S, ST. col. 2, l. 3, infert after act—51 Geo. III. In 1811, the number of houses for the parish, containing four hamlets, was 437, and that of inhabitants 1816.

DAVIDSON, l. 2, infert—West Tennessee; l. 6, r. 15,608, and 6305.

DAUM, or DAM, a copper coin in India, equal in value to the fourth part of a rupee.

DAUPHIN, in America, l. 6, for nine r. fifteen; l. 8, for 22,270 r. 31,883, of whom, in 1810, 26 were slaves.

DAWLISH. Add—By the returns in 1811, the parish of Dawlish contained 328 houses, and 1882 persons.

DAWSONIA, in *Botany*, a new and most curious genus of Mosses, dedicated, by Mr. Brown, to our valued friend. Mr. Dawson Turner, an eminent English botanist, particularly distinguished by his cryptogamic writings.—Br. Tr. of Linn. Soc. v. 10. 316.—Clafs and order, *Cryptogamia Musci*. Nat. Ord. *Musci*.

Eff. Ch. Fringe a tuft of very numerous, straight, equal hairs, originating from the central column, as well as from the mouth of the capsule. Outer veil of entangled hairs: inner rough at the summit. Capsule flat at one side.

1. *D. polytrichoides*. Br. t. 23. f. 1.—Found by Mr. Brown, on the shady banks of rivers, at the foot of the mountains, near Port Jackson, New South Wales. This moss exactly resembles some of our larger species of *Polytrichum*, (see that article,) while the figure of the capsule approaches *Buxbaumia*. The fringe is totally unlike every thing previously known. The leaves are linear, flat, fringed with sharp teeth.

DAYTON. Add—It contains 1746 persons.

DEAL, col. 3, l. 14, r. 7351, and 1340.

DEAN, MICHEL. In 1811 the parish contained 121 houses, and 535 persons; viz. 270 males, and 265 females: 31 families being employed in agriculture, and 77 in trade, &c.—

DEBENHAM, l. ult. r. 167 and 1224.

DECADIA, in *Botany*, a tree of Amboina and Cochin-China, so named by Loureiro on account of its ten petals.—Loureir. Cochin. 315. (*Arbor aluminosa*; Rumph. Amb. v. 3. 160. t. 100. Loureiro moreover cites Bobu; Burm. Zeyl. 26, which is also *Laurus ferrata*, floribus spicatis, ex foliorum alis provenientibus; ibid. 139. t. 62; Eugenioides; Linn. Zeyl. 192: but this does not agree with the plant of Rumphius.)—Clafs and order, *Isocandria Monogynia*, according to Loureiro, but by his description it belongs to *Polyandria*. Nat. Ord. *Guttiferis affine*. It seems nearly allied to *Elaeocarpus*.

Gen. Ch. Cal. Perianth of three permanent, roundish, hairy, keeled, spreading, unequal leaves. Cor. Petals ten, nearly ovate, somewhat serrated, erect, longer than the calyx: the outer ones largest. Stam. Filaments about 30, almost as long as the petals, into whose bases they are inserted; anthers two-lobed, roundish, permanent. Pist. Germen roundish, superior; style thread-shaped, the length of the filaments; stigma rather thick. Peric. Drupa ovate, rugged, small. Seed an ovate nut, of three cells.

Eff. Ch. Calyx of three leaves, inferior. Petals ten. Drupa with a nut of three cells.

1. *D. aluminosa*, called in Cochin-China *Cây Deung se*, is the only species. This is a middling-sized tree, with a smooth bark and spreading branches. Leaves alternate, stalked, lanceolate, serrated, smooth, of a bright green. Flowers

Flowers in small, nearly simple, clusters, about the ends of the branches, white, minute. Rumphius relates that the bark and leaves, which may be preserved dry for the purpose, are of great use, instead of alum, in dyeing, to improve and fix the red colours afforded by several Indian woods and roots.

DECAGON. Add—See DODECAGON.

DECANDRIA, in *Botany*, from *δέκα, ten*, and *ἀνρ, a man*, the tenth class of the sexual or artificial system of Linnæus, containing such plants as have ten separate or distinct stamens, in the same flower with the pistil. Hence it admits several papilionaceous plants so circumstanced, notwithstanding their natural affinity to others which belong to the seventeenth class, *Diadelphia*, the latter containing only such as have some sort of union or combination in their filaments, and those filaments are moreover of a peculiarly flat membranaceous structure, altogether different from those of proper decandrous flowers. (See DIADELPHIA.) The tenth class is divided into five orders, and comprises various natural tribes or families, many of which have allies in other parts of the system, and several of the genera have species whose parts of fructification are irregular in number.

DECASPORA, from *δέκα, ten*, and *σπορα, seed*.—Brown Prodr. Nov. Holl. v. 1. 548.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Epacridæ*. Br.

Eff. Ch. Calyx with two scales at the base. Corolla bell-shaped; limb loosely bearded. Stamens prominent. Berry with ten seeds.

A genus of elegant *shrubs*, found on the fourth coast of New Holland, with feathered stalked leaves, and terminal drooping spikes of red flowers. Berries violet.

1. *D. difflcha*, (Cyathodes difflcha; Labill. Nov. Holl. 1. 82.), and 2. *D. thymifolia*, are all the species mentioned.

DEDDINGTON. In 1811, the parish contained 252 houfes, and 1296 persons; 635 being males, and 661 females.

DEDDHAM. In 1811, the parish contained 264 houfes, and 1432 persons; 697 being males, and 735 females.

DEEPING-MARKET. In 1811, the parish contained 166 houfes, and 899 persons; 426 being males, and 473 females.

DEER, in America, l. 2, r. 674. Add—Also, a township of Westmoreland county, in Pennsylvania, having 2380 inhabitants.

DEER Creek, a town of Ohio, in the county of Pickaway, having 853 inhabitants.

DEER *Isle*, col. 2, l. 1, r. 1057.

DEERFIELD, l. 10, r. 1570; l. 16, r. 1851. Add—Also, a town of Ohio, in Portage county, having 394 inhabitants.—Also, a town of Ohio, in Ross county, having 629 persons.—Also, a town of Ohio, in Warren county, having 1181 persons.

DEERING, l. 3, r. 1363.

DEERINGIA, in *Botany*, in memory of Charles Deering, M. D., author of the *Flora Nottinghamsensis*, a botanist commended by Dillenius.—Brown Prodr. Nov. Holl. v. 1. 413.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Holeraceæ*, Linn. *Amaranthi*, Juff.

Eff. Ch. Calyx in five deep segments. Cor. none. Stamens united by an entire membrane. Anthers of two cells. Style deeply three-cleft. Berry superior, with many seeds.

1. *D. celosifoides*. Br. n. i. (*Celosia baccata*; Retz. Obs. fasc. 5. 23. Willd. Sp. Pl. v. 1. 1202.)—Native of New Holland and the East Indies. A smooth weak shrub, with alternate leaves. Spikes axillary and terminal. *Bractææ* three to each flower. Fruit pulpy, tumid.

DELAGOA, col. 2, l. 8, r. Kaffers.

DELAWARE. Add—See UNITED STATES.

DELAWARE County, l. 4, r. 14,734.—In New York, l. 2, r. 20,303 inhabitants, 55 in 1810 being slaves.

DELAWARE Township, l. 2, r. 472. Add—Also, a township in Mercer county, in Pennsylvania, having 218 inhabitants.—Also, a county of Ohio, containing seven townships, and 2000 inhabitants.—Also, a township of the same county, having 200 inhabitants.

DELI, a river of Persia, in Schirvan, which has its source in the Lefgean hills, and disembogues into the Caspian sea, about 20 miles S. of the Samur.

DELMER, a township of Tioga county, in Pennsylvania, having 884 inhabitants.

DELOS, col. 6, l. 21, r. ruin.

DEMBEA, col. 2, l. 16, r. Gorgora.

DE MURIS, JOHN, for MURIS, JOHN DE.

DENBIGH, col. 2, l. 45 and 46, r. 617 and 2714.

DENBIGHSHIRE, col. 2, l. 22, r. and 13,078 houfes, inhabited by 64,240 persons; 31,129 being males, and 33,111 females: of whom 3447 families are employed in trade and manufactures, and 7973 in agriculture.

DENMARK, a town of America, in the district of Maine, and county of Oxford, containing 436 inhabitants.

DENNIS, l. 4, r. 1739.

DEPTFORD, col. 3, l. 24, r. 1811, 19,833; l. 25, r. 3463.

DEPTFORD, in America, l. 2, add—containing 2978 inhabitants.

DERAGUZ, a district of Khorassan, which, as well as that of Cotchung, is situated between Meshed and Merv. Cotchung is governed by an independent chieftain, who can bring into the field 12,000 men, and who resides in the town of Cotchung, 23 furlongs from Meshed. The district of Deraguz touches on the W. the dependencies of Kelat; on the N. the country of the Turkomans of Tak, sometimes called Attok; and on the E. a branch of the Afhdur Koh. It is the property of Lutf Ali Khan, whose subjects are reckoned the bravest and most polite of the natives of Khorassan; and the soil which they inhabit is so fruitful, that dry grain yields a hundred, and rice four hundred fold.

DERBANE, a beautiful little river which rises in the state of Louisiana, and has its principal source in N. lat. 32° 50'. W. long. 93° 10', and pursues nearly an eastern course of 60 miles, entering Ouachitta from the west. It is navigable about one-half of its course for large boats. Its water, which is very pure, is supplied from numerous springs by many creeks, that are bordered by fine land.

DERBY, col. 6, l. 5 from the bottom, r. 2644, and 13,043.

DERBY, in America, in the census of 1810, probably called Derley by mistake. It has 114 inhabitants.—L. ult. r. 2051. Add—Also, a township of Ohio, in Madison county, having 257 inhabitants.—Also, a township of Ohio, in the county of Pickaway, having 475 inhabitants.

DERBY. See DARBY.

DERBYSHIRE, l. 12 and 13, r. 35,658, and 185,487.

DEREHAM, EAST, l. 4 and 5, r. 551 houfes, and 2888 inhabitants.

DEREHAM, *W^{est}*, a parish in the hundred of Clackclofe, having 58 houfes, and 428 inhabitants.

DERLEY. See DERBY.

DERRY, in America, l. 4, r. 2431; l. 5, 1341; l. 7, 2283; l. 8, 2380.

DESERT,

DESERT ISLAND, *Mount*. Add—Mount Defert contains 1047 inhabitants. See EDEN.

DESMANTHUS, in *Botany*, so called by the late professor Willdenow, who first separated the genus we are about to describe from MIMOSA; see that article, and ACACIA of the present volume. This name seems to be composed of *δέσμη*, a bandage, and *άνθος*, a flower; alluding perhaps to the strap-like filaments of the neutral flowers, common to every species.—Willd. Sp. Pl. v. 4. 1044. Ait. Hort. Kew. v. 5. 457.—Clafs and order, *Polygamia Monœcia*; or rather perhaps *Decandria Monogynia*. Nat. Ord. *Leguminosæ*, Linn. *Leguminosæ*, Juss.

Gen. Ch. *Cal.* Perianth inferior, of one leaf, tubular, with five teeth. *Cer.* of one petal, funnel-shaped, regular, more or less deeply five-cleft, sometimes of five petals. *Stam.* Filaments ten, rarely but five, capillary, equal, very long; anthers incumbent, oblong. *Pist.* Germen superior, ovate-oblong; style thread-shaped, the length of the filaments; stigma dilated, abrupt. *Peric.* Legume oblong, compressed, of two flat valves, and one cell, separated into several by transverse opposite striations in the valves. *Seeds* numerous, oblong, stalked. Several flowers, below the perfect ones, are neuter, having dilated lanceolate *stamens*, without *anthers*, no efficient *pistil*, and sometimes no *corolla*.

Effl. Ch. Calyx five-toothed. Corolla deeply five-cleft. Stamens definite. Pistil one. Legume of two valves. Some flowers neuter, with dilated, flat, abortive filaments.

Obs. Although the definition of this genus is not so striking as could be wished, it seems to us tolerably natural, being distinguished from *Acacia* by the definite number of its *stamens*, always twice as many as the divisions of the *corolla*, and by the presence of several neuter flowers, in the lower part of each tuft, or spike, known by their dilated, strap-shaped filaments, destitute of *anthers*, and more or less different in colour from the perfect flowers. We are nevertheless aware, that generic characters founded on such anomalies or imperfections, are always the least solid; these neutral flowers, apparently created for no end, being doubtless liable to become, according to circumstances, perfect in one organ of impregnation or the other. The habit of the genus before us is pretty uniform, having doubly pinnate leaves, with numerous, oblong, obtuse, crowded leaflets; axillary, solitary, stalked, oblong spikes, of crowded tassel-like flowers; and flat, generally broad, elliptic-oblong, smooth legumes, whose transverse striations make them resemble the jointed fruit of what now remains as *Mimosa*, but their valves do not split at those striations. As only ten species of *Desmanthus* are described, we shall give the whole. They are all of tropical origin; partly herbaceous, and sometimes annual, with sensitive leaves; partly shrubby.

SECT. I. *Without thorns.*

1. *D. lacustris*. Lake Desmanthus. Willd. n. 1. ("Mimosa lacustris; Humb. and Bonpl. Pl. æquinoct. t. 16.")—"Thorns none. First division of the leaves of three pair; second of many pair. Spikes ovate. Stalks bracted. Stem round, creeping."—Native of marshes in South America. *Root* perennial. *Stem* herbaceous. First divisions of the leaves an inch and a half long. *Leaflets* numerous, linear, obtuse at each end. *Spikes* barren in their lower part, each supported by a stalk longer than the foliage, furnished with two or three ovate-lanceolate deciduous bractææ. *Legume* oblong, pointed, with from four to six seeds. Very nearly related to the following. *Willdenow.*

2. *D. natans*. Floating Desmanthus; or Aquatic Sensitive. Willd. n. 2. Ait. n. 1. Andr. Reppf. t. 629. (*Mimosa natans*; Vahl Symb. v. 3. 102. Roxb. Cor-

mand. v. 2. 11. t. 110. *M. orientalis* non spinosa, rarioribus ramis, floribus spicatis; Pluk. Almag. 252. Phyt. t. 307. f. 4. *Neptunia oleracea*; Loureir. Cochinch. 654. "Niti-todda-vaddi; Rheede Hort. Malab. v. 9. 35. t. 20.")—Thorns none. First division of the leaves of three pair; second of many smooth-edged leaflets. Spikes oblong, interrupted. Stalks mostly without bractææ. Stem round, floating, with tufted roots from the lower joints.—Native of fresh-water lakes, pools, and flow streams, in the East Indies, Cochinchina, &c. Loureirô says it is cultivated in the last-mentioned country, as an ingredient in salads, being tender and agreeably sweetish, though not very salutary to the stomach. The plants are tied to stakes, to prevent their being carried away with the stream. The root is annual, entirely floating, as well as the round, smooth, branched, leafy stems, whose lower joints send forth tufts of compound radicles, their interstices being often swollen, or spongy, at one side, as if to render the herb more buoyant. *Leaves* alternate, stalked, doubly pinnate, smooth, bright green; secondary divisions from one to two inches long, each of twelve or thirteen pair of elliptical, entire leaflets, which fold together slowly when touched; their edges smooth. *Stipulas* membranous, half-ovate, or heart-shaped, obtuse. Common flower-stalks generally naked; sometimes furnished with a bractææ or two. *Spike* oblong, more or less crowded. *Corolla* greenish. Abortive filaments of the lower flowers large, lanceolate, yellow, very conspicuous. *Legumes* five or six from each spike, an inch in length, purplish-brown, smooth, elliptic-oblong, pointed. *Seeds* oval, from four to eight, forming a central row, inserted by a slender thread alternately to each margin of the legume. Kœnig sent specimens of the following to Linnæus, but not, as far as we can discover, of the present species; while the information he communicated regarded both species, which possibly he might originally confound, thinking the *triquetrus* a variety caused by growing out of the water. However this might be, his *natans* is certainly the present plant, to which alone that name can apply.

3. *D. triquetrus*. Triangular-stalked Desmanthus. Willd. n. 3. (*Mimosa triquetra*; Vahl Symb. v. 3. 102. *M. natans*; Linn. Suppl. 439.)—Thorns none. First division of the leaves of two or three pair; second of many rough-edged leaflets. *Stipulas* pointed. Spikes globose. *Stalks* bracted. *Stems* prostrate; triangular in their upper part.—Native of the dry borders of fields at Tranquebar. *Kœnig* in the Linnean herbarium. *Root* woody, perennial. *Stems* several, from a span to a foot or more in length, herbaceous, prostrate, rather zigzag, leafy, smooth, somewhat glaucous, scarcely branched; nearly round at the bottom, but triangular above. *Leaves* about half the size of the former, on much shorter stalks, and essentially distinguished, if we mistake not, by the roughness of their edges, caused by small close-pressed bristles. The *stipulas* are obliquely ovate, ribbed, with a tapering bristly point, which we do not find in *D. natans*. *Flower-stalks* not much longer than the leaves, each bearing one or more broad clasping bractææ. *Spikes* short and roundish. *Legumes* elliptic-oblong, obtuse, with four, five, or six seeds.

4. *D. plenus*. Semi-double Yellow Desmanthus. Willd. n. 4. Ait. n. 2. (*Mimosa plena*; Linn. Sp. Pl. 1502. *M. foliis duplicato-pinnatis, spicarum floribus inferioribus plenis, caule inermi procumbente*; Linn. Hort. Upf. 145. n. 3. *M. non spinosa, palustris et herbacea, procumbens, flore luteo pleno*; Rel. Hoult. 10. t. 23. *M. n. 2*; Mill. Ic. v. 2. 122. t. 182. f. 2.)—Thorns none. First division of the leaves of three or four pair; second of numerous oblong smooth-edged leaflets. *Spikes* ovate. *Stalks* bracted. Stem

DESMANTHUS.

Stem prostrate, compressed. Stamens five.—Gathered in stagnant waters at Vera Cruz by Dr. Houtfoum, who sent seeds to Miller. The latter records that the *stems*, though naturally floating, grew more erect when the plant was cultivated on dry ground. The *root* is annual, according to Willdenow, Aiton, and Linnæus, who had this species in the stove at Uptal. *Stems* herbaceous, smooth, a little zigzag, a foot or two in length, floating or decumbent, slightly branched. *Leaves* sensitive, larger than those of *D. natans*. *Stipulas* acute, obliquely and broadly ovate. *Spikes* as large as Common Clover, yellow, recurved, on *stalks* nearly as long as the leaves, bearing two distant, ovate, sheathing *bractæes*. *Stamens* but five, those of many of the lower *flowers* changed to long lanceolate petal-like leaves, which give the flowers a double appearance, and render them truly so, according to the analogy of flowers in general. Hence the specific name given by Linnæus; but this circumstance is common to the whole genus of *Desmanthus*, as above described. In this and similar cases it seems best to retain the original name, as indicating the first known species; and therefore the history of the genus. The *legume* is drawn by Houtfoum elliptic-oblong, slightly curved, with a furrow, or double edge, along the back. *Seeds* numerous, ovate. The *leaves* are sensitive in this and the three preceding.

5. *D. depressus*. Depressed *Desmanthus*. Willd. n. 5. —“Thorns none. First division of the leaves of two pair; second of eight or ten pair of linear obtuse leaflets. Spikes capitate, of a few decandrous flowers. Legumes linear. Stem prostrate.”—Found by Humboldt and Bonpland, in South America. *Root* woody, perennial. *Stems* several, from a span to a foot long, diffuse, smooth; and branched and round at the bottom; obscurely quadrangular above. *Spikes* stalked, without *bractæes*. *Legume* an inch and a half long, pointed, with many *seeds*. Akin to the two following, as to the shape of the *spike* and of the *legume*, though easily distinguishable by the specific characters. *Willdenow*.

6. *D. diffusus*. Prostrate *Desmanthus*. Willd. n. 6. Ait. n. 3. (*Mimofa pernambucana*; Linn. Sp. Pl. 1502. M. inermis decumbens, foliis duplicato-pinnatis, spicis cernuis, floribus pentandris, inferioribus castratis; Linn. Hort. Upt. 145. n. 4. M. americana pigra, filiquis longis angustis, allium olentibus; Pluk. Amag. 252. t. 307. f. 3.)—“Thorns none. First division of the leaves of four or five pair; second of twelve pair. Spikes capitate, of a few pentandrous flowers. Legume linear. Stem prostrate.”—Native of South America. *Stem* shrubby. Willdenow, who had examined dried specimens, says this species is extremely similar to the following, but differs in having most commonly five primary divisions in the *leaves*, a prostrate *stem*, and only five *flamens*. We have never seen the present species, which probably has not appeared in the gardens since Miller's time, but we venture to transfer the synonym of Zanoni to the next, on account of the upright stem of his plant. Hence the Linnæan specific name *pernambucana*, taken from Zanoni, becomes peculiarly unsuitable, and is fortunately changed by Willdenow.

7. *D. virgatus*. Upright Angular *Desmanthus*. Willd. n. 7. Ait. n. 4. (*Mimofa virgata*; Linn. Sp. Pl. 1502. Jacq. Hort. Vind. v. 1. 34. t. 80. M. spuria di Pernambuco, detta Mimofa italica; Zanoni. It. 151. t. 60. M. inermis, foliis duplicato-pinnatis, filiquis linearibus glabris; Linn. Hort. Cliff. 209.)—Thorns none. First division of the leaves of four pair; second of twelve pair. Spikes capitate, of a few decandrous flowers. Legume linear. Stem erect, angular.—Native of South America, where Jacquin observed it in various places; and not of the East Indies, Burmann's *M. virgata* being probably our *D.*

natans, at least according to the synonyms of Plukenet and Rheede, cited by that author. The late professor Jacquin sent seeds of this present species to Kew, in 1774, where it flowers in the stove in July and August. His plant is precisely that of Linnæus, mentioned in the *Hortus Cliffortianus* as of American origin, but confounded with several other things in his *Fl. Zeylanica*, 216, n. 505. *D. virgatus* has an erect shrubby *stem*, with wand-like *branches*, angular when young, but less so as they become older. *Stipulas* brittle-shaped, with a round aricle. Common *footstalks* with a round depressed gland between the first pair of subdivisions. *Leaflets* linear, obtuse, fringed, glaucous beneath. *Flower-stalks* the length of the leaves, erect, with small deciduous *bractæes* near the top. *Heads* slightly drooping while young, pale or whitish. Several of the lowermost *flowers* furnished with ten linear, very narrow, almost thread-shaped, abortive filaments, in the place of *flamens*. *Antbers* of the upper *flowers* roundish, yellow. *Legumes* about five from each head, almost erect, full two inches long, linear, not one-eighth of an inch broad, acute, thick-edged, smooth. *Seeds* very numerous, elliptic-oblong, obliquely disposed in a central row. Miller's remark, cited by Willdenow, after Linn. Mant. 2. 503, does not belong to this species, and is excluded by Linnæus himself in his MSS. Probably it may relate to *D. plenus*.

8. *D. punctatus*. Spotted-stalked *Desmanthus*. Willd. n. 8. Ait. n. 5. (*Mimofa punctata*; Linn. Sp. Pl. 1502. M. frutescens media inermis, filiquis compressis falcatis et umbellatis, pedunculo longissimo; Browne Jam. 253. Aeschynomene mitis prima; Comm. Hort. v. 1. 61. t. 31.)—Thorns none. First division of the leaves of four or five pair; second of many. Spikes ovate. Flower-stalks bracteated at the base. Legume oblong, obtuse, wavy.—Native of Jamaica, from whence it was introduced very early into the European stoves. Our specimen was sent by Dr. Browne to Linnæus. The *stem* is besprinkled with small callous points. *Branches* angular. *Leaves* a span long, with a gland on the common *footstalk* between the first pair of wings. *Leaflets* about twenty pair, sensitive, linear-oblong, smooth, obtuse with a small point. *Flower-stalks* scarcely so long as the leaves, each bearing, near the base, two large ovate, or heart-shaped, *bractæes*. *Spike* drooping, ovate, of numerous, crowded, pale *flowers*, the lower ones with thin lanceolate *petals*, in the place of the ten *flamens* of the more abundant upper ones. *Legumes* about three from each *spike*, stalked, horizontal, compressed, oblong, obtuse at each end, with a small terminal point; their length an inch and a half; breadth one-third of an inch. They betray an inclination to split across, like the true *Mimofæ*. *Seeds* about twelve, ovate. This species does indeed, as Willdenow observes, much resemble *D. plenus*; but is nevertheless much too different to be confounded therewith.

Sect. 2. Thorny.

9. *D. cinereus*. Ash-coloured *Desmanthus*. Willd. n. 9. Ait. n. 6. (*Mimofa cinerea*; Linn. Sp. Pl. 1505. Roxb. Coromand. v. 2. 39. t. 174. M. n. 215; Linn. Fl. Zeyl. 96. Acacia spinosa, ex alis spicata, foliis pennas avium referentibus; Burm. Zeyl. 3. t. 2. A. maderaspatana, minutissimis foliis, aculeis ferocibus, alternis, frondosa; cortice itidem cinereo; Pluk. Almag. 3. Phyt. t. 121. f. 5.)—Branches becoming solitary spines. First division of the leaves about nine pair; second of many. Spikes solitary, cylindrical, drooping; tapering at the base. Legumes linear, curved.—Native of the East Indies; in forests and low barren lands, according to Dr. Roxburgh, who observes that the wood is remarkably hard, but,

owing

owing to the smallness of the tree, of little use. Miller cultivated this plant at Chelsea in 1739, and it is marked by Mr. Aiton, as flowering in the above about June and July. A low, irregular, rigid shrub, with a grey bark, and zigzag branches, whose short, alternate, lateral shoots spread horizontally, and each finally becomes tipped with a hard sharp thorn. These branches bear very fine and delicate foliage, whose very minute oblong leaflets are smooth above, hairy at the back, and appear to be sensitive; their common stalk also is hairy. Spikes axillary, stalked, an inch or two long, swelling upward, obtuse, dense, and many-flowered. Perfect flowers numerous, yellow, with ten stamens, whose anthers are ovate, of two cells, and tipped with a small round gland. The lower flowers, less numerous, are pale rose-coloured, abortive, having ten linear, obtuse, strap-like leaves instead of stamens. Legume falcate, linear, compressed, but not flat, about three inches long, and one-fourth of an inch broad, smooth, obtuse. Seeds ten to fifteen, oblong, yellow.

10. *D. divergens*. Spreading-branched Desmanthus. Willd. n. 10. ("Erget Dimmo; Bruce's Travels, v. 5. 34, with a plate.")—"Branches becoming solitary spines. First division of the leaves of eight pair; second of many. Spikes in pairs, cylindrical, pendulous. Legume twisted."—Native of Abyssinia? *A. shrub*, six feet high, with divaricated furrowed branches, besprinkled with white warts. First divisions of the leaves from six to nine pair. Leaflets numerous, linear, angular at the base, and fringed at the edges. Thorns rigid, straight, awl-shaped, sometimes in pairs. Legume linear, contorted. Willdenow, who made this description from a living specimen, says the gardeners call this species *Mimosa divaricata*. But what is so denominated in Donn's *Hort. Cant.* ed. 5. 240, comes from Carolina, and, as far as we can discover, does not occur in *Hort. Kew.* Bruce's figure above quoted was thought by Willdenow to answer exactly to his own garden shrub, except the want of thorns; but as these occur on the older branches only, they might be overlooked. We have not seen specimens of either Bruce's or Willdenow's plant.

DETROIT. Add—The civil district of Detroit, which is one of the divisions of the territory of Michigan, contains, by the census of 1810, 2227 inhabitants, of whom 17 were slaves.

DEVAUXIA, in Botany, so named by Mr. Brown, in honour of M. Devaux, author of a dissertation on the natural family of *Junci*, in the *Journal de Botanique*. M. Labillardiere had previously published this same genus under the appellation of *Centrolepis*, from *κεντρος*, the centre, and *λεπις*, a scale; which, giving an erroneous idea of the structure of the flower, it was found necessary to change.—Brown Prodr. Nov. Holl. v. 1. 252. (*Centrolepis*; Labill. Nov. Holl. v. 1. 7.)—Class and order, *Monandria Polygynia*, Nat. Ord. *Raffiaceae*, Brown.

Gen. Ch. *Cal.* Sheath of two concave, keeled, permanent, alternate valves, clasping each other at the base, containing an indefinite number of flowers. *Cor.* of two oblong, membranous valves, sometimes accompanied by small accessory scales. *Stam.* Filament one, capillary, drooping, rather longer than the largest valve of the corolla; anther simple, oval. *Pistl.* Germens several, from three to twelve, ovate-oblong, superior, inserted into one side of a central oblong receptacle, and all turned one way; styles as many, thread-shaped, either distinct at the bottom or combined, spreading or deflexed at the summit; stigmas linear, downy. *Peric.* Capsules as many as the germens, membranous, oval, of one

valve and one cell, bursting along one side. *Seed* solitary, obovate, pendulous.

Efl. Ch. Sheath of two valves, with several flowers. Corolla of two membranous valves. Anther simple. Germens unilateral. Capsules bursting longitudinally, at one side. *Seed* solitary.

This genus, of which we have already spoken as akin to *ALEPYRUM*, (see that article,) consists of small herbaceous plants, growing in tufts, and resembling the lesser species of *Scirpus*. The roots are fibrous and tufted. *Stem* none. *Leaves* radical, brittle-shaped, half sheathing at the base. *Flower-stalks* radical, thread-shaped, undivided, naked. *Sheath* solitary, terminal, its valves either awned or not. Nine species are described by Mr. Brown, as follows.

SECT. 1. *Receptacle scaly.*

1. *D. pulvinata*. Cushion Devauxia.—Receptacle scaly. Styles six or seven, distinct. Sheath pointless; lower valve rather hipid; upper smooth. Leaves nearly as tall as the flower-stalks.—Gathered by Mr. Brown, in Van Diemen's island.

2. *D. Paterfoni*. Pateron's Devauxia. (*Centrolepis æmula*; Rudge Tr. of Linn. Soc. v. 10. 284. t. 12. f. 2.)—Receptacle scaly. Styles eight or nine, distinct. Sheath pointed, many-flowered; upper valve nearly smooth; lower hipid. Adult flower-stalks hairy, as well as the leaves, which are only one-third as tall.—Gathered by Col. Paterfon and Mr. Brown, near Port Jackson, New South Wales. *Leaves* very narrow, an inch long. *Flower-stalks* above two inches high. *Sheath* tumid, scarcely rising above the flowers.

3. *D. strigosa*. Britfly Devauxia.—Receptacle scaly. Styles from five to seven, distinct. Sheath pointed; both valves hipid. Adult flower-stalks smooth, thrice as long as the finely hipid leaves.—Found by Mr. Brown, on the southern coast of New Holland.

SECT. 2. *Receptacle without scales. Sheaths hipid.*

4. *D. tenuior*. Slender Devauxia.—Receptacle naked. Styles four or five, combined at the base. Sheath almost pointless, bristly as well as the leaves. Flower-stalk slightly hairy.—Found in the island of Van Diemen, by Mr. Brown.

5. *D. Billardieri*. Labillardiere's Devauxia. (*Centrolepis fascicularis*; Labill. Nov. Holl. v. 1. 7. t. 1. C. cuspidigera; Rudge Tr. of Linn. Soc. v. 10. 283. t. 12. f. 1.)—Receptacle naked. Styles two or three, combined at the base. Sheath bristly; with awns nearly as long as the valves. Leaves rather hairy. Stalks smooth.—Native of Port Jackson, as well as of Van Diemen's island. *Brown, Labillardiere*. The numerous brittle-shaped leaves are about an inch and a half long, erect; those which clasp the base of each flower-stalk, which is half as tall again, are toothed at their inner margin towards the base. *Valves* of the sheath twice as tall as the flowers. *Corolla* toothed, obtuse.

6. *D. exserta*. Prominent-flowered Devauxia.—Receptacle naked. Styles from seven to ten, distinct. Sheath pointless, bristly, not quite so long as the flowers. Stalks and leaves downy.—Gathered by Mr. Brown, in the tropical part of New Holland.

SECT. 3. *Receptacle without scales. Sheaths smooth.*

7. *D. Banksii*. Banksian Devauxia.—Receptacle naked. Styles from eight to ten. Sheath pointless, very smooth, many-flowered, membranous at the edges. Stalks three or four times the length of the leaves.—Gathered by Sir Joseph Banks, in the tropical part of New Holland.

8. *D. pusilla*. Little Devauxia.—Receptacle naked. Styles six or seven. Sheath pointless, very smooth, membranous at the edges, with but few flowers. Stalks and leaves

leaves both smooth, and nearly equal in length.—Observed by Mr. Brown, in the tropical part of New Holland.

D. ariflata. Awned Devauxia.—Receptacle naked. Styles six or seven, combined at the base. Sheath smooth, with longish awns. Stalks two-edged.—Found by Mr. Brown on the southern coast of New Holland.

Mr. Rudge, very commendably anxious to retain, if possible, Labillardiere's original generic name, has, by taking *xilipes* for a *prickle*, as it undoubtedly means a *point*, or *sharp spike*, made *Centrolepis* to express a *prickly scale*, alluding to the hispid *sheaths* of some species. But this is not apposite, the scales, or glumes of the *flower*, to which the original name applied, being, in no sense, pointed, or prickly; nor do we see that this name can be forced into any appropriate meaning, the *scales* being acknowledged on all hands not to be central.

DEVIZES, col. 2, l. *penult.* r. 696, and 3750.

DEVONSHIRE, col. 6, l. 11 and 12, r. 62, 318, and 383, 308.

DEW. To this article we shall subjoin some appropriate remarks, selected from an "Essay on Dew, &c." by the ingenious Dr. Wells, lately (*viz.* 1810) republished in an edition of his works, to which is prefixed a Memoir of his life written by himself. To this author it occurred in 1784, that the formation of dew is attended with the production of cold. The same opinion was announced in 1788 by Mr. Wilson of Glasgow (vol. i. Edinb. Transf.), and also by Mr. Six of Canterbury (Phil. Transf. for 1788, and in a posthumous work printed at Canterbury in 1794.) All these writers at first concurred in regarding the cold which accompanies dew as an effect of the formation of that fluid. Dr. Wells, however, upon mature consideration of the subject, was led to suspect that this opinion was erroneous; and his suspicion was afterwards justified by a variety of observations and experiments. Although Dr. Wells agrees, in general, with Aristotle and other writers, and maintains that dew appears only on calm and serene nights, yet this opinion is not universally true; for he frequently found a small quantity of dew on grass, both on windy nights, if the sky was clear or nearly so, and on cloudy nights, if there was no wind; but he never perceived dew on nights both cloudy and windy. Dew, he says, probably begins, in this country, to appear upon grass, (shaded from the sun, during clear and calm weather, soon after the heat of the atmosphere has declined; and it continues to form, in shaded places, after sun-rise; the interval between sun-rise and its ceasing to form being considerably shorter than that between its first appearance in the afternoon and sun-set. If the weather be favourable, however, more dew forms a little before, and in shaded places a little after sun-rise, than at any other time; whereas Muschenbroeck asserts, that dew does not form after the sun has risen. Our author also maintains, in opposition to the opinion of M. Prieur, that dew, after it has once commenced, continues during the whole night, if the weather remain still and serene. During nights that are equally clear and calm, whether they be longer or shorter, dew often appears in very unequal quantities; the quantity of moisture in the atmosphere serving to increase the production of dew; and, accordingly, in equally clear and calm nights, dew is more abundant soon after rain than during a long continuance of dry weather: it is also more abundant in Europe, and in some parts of Asia and Africa, with southerly and westerly winds, than with those which blow from the north and the east. Another circumstance upon which the quantity of dew depends, is the diminution of the weight of the atmosphere; for though the falling of the mercury in the baro-

meter is commonly attended with wind or clouds, both unfavourable to the production of dew, yet the greatest dew observed by our author occurred while the barometer was sinking. M. De Luc also has observed, that rain may be foretold when dew is uncommonly abundant in relation to the climate and season. We have already observed, that dew is commonly more plentiful in spring and autumn than in summer, a fact which our author also has noticed; it is always very copious on clear and calm nights which are followed by misty or foggy mornings; and on a clear morning which succeeds a cloudy night. Heat of the atmosphere, if other circumstances are favourable, occasions a great formation of dew; and upon the supposition of the same clearness and stillness of the atmosphere, more dew is formed between midnight and sun-rise than between sun-set and midnight; the cold of the atmosphere being greater in the latter than in the former part of the night. Our author's experiments serve to shew, that various differences with regard to situation, mechanical state, and real nature of bodies, have a very considerable influence upon the production of dew. As to situation he observes, that whatever diminishes the view of the sky, as seen from the exposed body, diminishes the quantity of dew that is produced; thence the quantity is greater when the exposure to the sky is more complete. There are other circumstances, regarding situation, which serve to augment or diminish the quantity of dew that is produced, when the substances that are used for indicating it are the same.

It is observed farther, that when other circumstances are similar, a difference in the mechanical state of bodies has an effect with regard to the quantity of dew which they attract; and hence it is, that fine raw silk, fine unwrought cotton, and flax, were found to attract more dew than the wool employed by our author in his experiments; the fibres of wool being thicker than those of the other substances just mentioned. Bright metals also attract dew much less powerfully than other bodies: this fact was observed by Muschenbroeck and Dufay; but they erroneously asserted, that dew never appears on the upper surface of bright metals. There are others, and our author in particular, who have known dew to be formed on gold, silver, copper, tin, platina, iron, steel, zinc, and lead. This inaptitude of metals to attract dew is communicated to bodies of a very different nature, which touch or are near to them. Wool, says our author, laid upon a metal, will acquire much less dew than an equal quantity laid upon grass in the immediate vicinity. It is maintained, that the upper surfaces of metals are most readily and most copiously dewed on those nights and in those parts of the night, during which other substances are the most readily and the most copiously dewed. All metals, our author remarks, do not resist the formation of dew with the same force. "I saw," he says, "for example, platina one night distinctly dewed, while gold, silver, copper, and tin, though similarly situated, were entirely dry; and I have also several times seen these four metals free from dew, while iron, steel, zinc, and lead, were covered with it."

Our author proceeds to investigate and ascertain the degree of cold connected with the formation of dew. Mr. Wilson, he thinks, is the first philosopher who ever suspected the existence of such a conjunction; though dew is often spoken of as cold by our popular writers. Herodotus mentions it as possessing this quality; Cicero and Virgil apply to it the epithet of "gelidus;" Milton that of "chill;" and Collins that of "cold." With thermometers adapted to the purpose, he has, in serene and still nights, examined the temperature of dewed grass, and con-

stantly found it to be less than that of the air, any where between one inch and nine feet above the ground, the latter being the greatest height at which he ever marked the heat of the atmosphere in these experiments. At the height of four feet above the ground, and in calm and clear nights, he frequently found the grafs seven, eight, or nine degrees colder than the air at that height; several times it was 10° and 11° , and once 12° , colder than the air. In some few observations, the greater coldness of grafs than that of the air began to appear, in clear and calm weather, in places sheltered from the afternoon sun, and yet open to a considerable portion of the sky, soon after the heat of the atmosphere had declined. A similar coldness continued upon grafs in still and serene mornings, for some time after the rising of the sun, in places shaded from its direct light, but otherwise open to the sky. In cloudy nights, particularly with wind, the grafs was never much colder than the air. Sometimes the temperatures were the same; at other times that of the grafs was higher, even when it had been wetted by preceding rain, and when it must have cooled by evaporation. When the night changed from clear to cloudy, though without change as to calmness, a considerable alteration in the temperature of the grafs always ensued, and this change occurred sometimes very suddenly. On one night, the grafs, after having been 12° colder than the air, became 2° colder, the temperature of the air at both observations being the same. On a second night, the grafs became 9° warmer in an hour and a half. On a third night, in less than forty-five minutes the temperature of the grafs rose 15° , while that of the neighbouring air increased $3\frac{1}{2}^{\circ}$. On a fourth night, the temperature of the grafs at half-past 9 o'clock was 32° ; in twenty minutes afterwards it was found to be 39° , the sky in the mean time having become cloudy. At the end of twenty minutes more, the sky being clear, the temperature of the grafs was again 32° . On the connection of fog or mist with cold, Dr. Wells made several experiments, which we cannot recite. He observes, that he has always found on dewy nights the temperature of the earth half an inch or an inch beneath its surface much warmer than the grafs upon it; and the earth at this depth was also almost constantly warmer on dewy nights than the air. Metals, says our author, furnish proofs of the connection of dew with cold in the substances on which it forms superior to that of the neighbouring atmosphere. Upon the whole, our author's experiments, which we cannot minutely detail, shew, that when bodies which had been equally exposed to the night air were examined at the same time, those which were most dewed were the coldest. In the prosecution of experiments with other substances besides grafs, he found that those of the filamentous downy kind were the most productive of cold. Thus, wool of moderate fineness, very fine raw silk, very fine unspun cotton, fine flax, and swan-down, were not only more steadily cold, upon clear and calm nights, than grafs, but also gave rise to a greater degree of cold than was almost at any time observed upon it even in its best state. Wool produced the least cold, and we have found before, that it attracted less dew than silk, cotton, and flax. Fresh, unbroken straw, and shreds of white paper, were found to be a little more productive of cold than wool. The next class consisted of bodies in the state of powder; these were, clean river sand, glass, chalk, charcoal, lamp-black, and a brown calx of iron. Chalk produced the least, and the three last substances produced the greatest cold. Solid substances, exposing to the sky a surface of at least twenty-five inches square, formed a third class, on which our author made experiments. The substances of this description subjected to

trial were, glass, brick, cork, oak-wood, and wax; all of which were found inferior to the filamentous substances. His principal experiments, however, of this kind were made on snow.

The next subject to which Dr. Wells directs his attention is the theory of dew. According to Aristotle among the ancients, and many philoſophical writers among the moderns, dew is a species of rain, formed in the lower atmosphere, in consequence of its moisture being condensed by the cold of the night into minute drops. But opinions of this kind have been found erroneous by the confideration of a fact first noticed by Geſten in 1733; viz. that bodies a little elevated in the air often become moist with dew, while similar bodies, lying on the ground, remain dry, though necessarily, from their position, as liable to be wetted, by whatever falls from the heavens, as the former. It was soon afterwards observed by Mufchenbroeck, that metals will be free from dew, while other bodies attract it copiously: hence Dufay concluded, that dew is an electrical phenomenon, since it leaves untouched the bodies which conduct electricity, whilst it appears upon those which cannot transmit that influence. Against this hypothesis several objections have been urged, however plausibly it has been supported. It has been alleged that charcoal, which next to the metals is the best solid conductor of electricity, attracts dew very powerfully; and dew, as we have seen above, frequently forms upon metals themselves. It has also been urged against this hypothesis, that dew forms in different parts of the night, in quantities disproportioned to the degrees of electricity found in the atmosphere at the same time. Thus, it is commonly more copious in the morning than in the evening, though the air is observed to be, in the latter season, more highly electrical than in the former. But another argument applies alike to all the theories which have hitherto been made public on the cause of dew; and this is, that none of them include the important fact, that its production is attended with cold. Mr. Wilſon and Mr. Six have indeed maintained, that the formation of this fluid is the cause of the cold that accompanies it. Dr. Wells once held the same opinion; but finding that bodies would sometimes become colder than the air without being dewed, and that when dew was formed, its quantity, and the degree of cold which appeared with it, were very far from being always in the same proportion to each other, he first doubted its truth, and at length became convinced that it was erroneous; and by farther inquiry he was led to conclude, that dew is the production of a preceding cold in the substances upon which it appears; and that it has precisely the same immediate cause as the presence of moisture upon the outside of a glass or metallic vessel, when a liquid considerably colder than the air has been poured into it shortly before. This fact is applied by our author, to the explanation of several atmospheric appearances.

" I. The variety in the quantities of dew, which were found by me upon bodies of the same kind, exposed to the air during the same time of the night, but in different situations, is now seen to have been occasioned by the diversity of temperature, which existed among them.

" II. Agreeably to the opinion of Mr. Wilſon and Mr. Six, the cold connected with dew ought always to be proportional to the quantity of that fluid; but this is contradicted by experience. On the other hand, if it be granted, that dew is water precipitated from the atmosphere, by the cold of the body on which it appears, the same degree of cold, in the precipitating body, may be attended with much, with little, or with no dew, according to the existing state of the air in regard to moisture; all of which circumstances are found actually to take place.

“ III. The formation of dew, indeed, not only does not produce cold, but like every other precipitation of water from the atmosphere, produces heat.

“ IV. In very calm nights, a portion of air, which comes in contact with cold grafs, will not, when the surface is level, immediately quit it, more especially, as this air has become specifically heavier than the higher, from a diminution of its heat, but will proceed horizontally, and be applied fuceffively to different parts of the fame furface. The air, therefore, which makes this progress, muft at length have no moisture to be precipitated, unless the cold of the grafs which it touches fhould increafe. Hence in great meafure it to be explained, why, on fuch nights as have been juft mentioned, more dew was acquired by fubftances placed on the raifed board, than by others of the fame kind on the grafs, though it began to form much fooner in the latter than in the former fituation, thofe on the raifed board having received air, which had previously deposited lefs of its moisture.

“ A reafon is now alfo afforded, why a flight agitation of the atmosphere, when very pregnant with moisture, fhould increafe the quantity of dew; fince frefh parcels of air will hence be more frequently brought into contact with the cold furface of the earth, than if the atmosphere were entirely calm.

“ V. Dew, in agreement with the immediate caufe which has been affigned by me for its production, can never be formed, in temperate climates, upon the naked parts of a living and healthy human body, during the night; fince their heat is never lefs in this feafon, in fuch climates, than that of the atmosphere. I have, in fact, never perceived dew on any naked part of my own body at night, though my attention was much occupied, for three years, with every thing relative to this fluid, and though I had been, during that period, much expofed to the night air. On the other hand, in very hot countries, the uncovered parts of a human body may fometimes, from being confiderably colder than the air, condense the watery vapour of the atmosphere, and hence be covered with a real dew, even in the day-time.

“ VI. Hygrometers formed of animal or vegetable fubftances, when expofed to a clear fky at night, will become colder than the atmosphere; and hence, by attracting dew, or, according to an obfervation of Sauffure, by merely cooling the air contiguous to them, mark a degree of moisture, beyond what the atmosphere actually contains. This ferves to explain an obfervation made by M. De Luc, that in ferene and calm weather, the humidity of the air, as determined by an hygrometer, increafes about, and after fun-fet, with a greater rapidity, than can be attributed to a diminution of the general heat of the atmosphere.”

Having eftablifhed the fact, that bodies become colder than the neighbouring air, before they are dewed, and applied this fact to the explication of many atmospheric appearances, we fhall now proceed with the author to complete the investigation of his theory with refpect to the caufe of dew; and hence he avails himfelf of the difcoveries on heat and its radiation, that have been made by profeflor Leflie, Dr. Herschel, and count Rumford. (See HEAT.) “ The experience of molt perfons,” fays Dr. Wells, “ refpecting the communication of heat among bodies in the open air, is confined to what happens during the day; at which time, thofe that are fituated near to one another are always found to poffefs the fame temperature, unlefs fome very evident reafon for the contrary fhould exift. To many, therefore, it may appear incredible, that a perfectly dry body, placed in contact, on all fides,

with other bodies of the fame temperature with itfelf, fhall afterwards, without undergoing any chemical change, become much colder than they are, and fhall remain fo for many hours; yet thefe circumftances are found to occur in fubftances attractive of dew, when laid on the furface of the earth, in a ftill and ferene night, and are in perfect agreement with the doctrine of heat, now univerfally admitted to be juft.

“ To render this more eafy of apprehenfion, let a fmall body which radiates heat freely, and poffeffes a temperature, in common with the atmosphere, higher than 32° , be placed, while the air is clear and ftill, on a flow conductor of heat lying on the furface of a large open plain, and let a firmament of ice be fuppofed to exift at any height in the atmosphere; the confequence muft be, that the fmall body will, from its fituation, quickly become colder than the neighbouring air. For, while it radiates its own heat upwards, it cannot receive a fufficient quantity from the ice to compensate this lofs; little alfo can be conveyed to it from the earth, as a bad conductor is interpofed between them; and there is no folid, or fluid except the air, to communicate it laterally either by radiation or conduction. This fmall body, therefore, unlefs it fhall receive from the air, nearly as much heat as it has emitted, which, confidering the little that can be communicated from one part of the atmosphere to another, in its prefent calm ftate, muft be regarded as impoffible, will become colder than the air, and condense the watery vapour of the contiguous parts of it, if they fhould contain a fufficient quantity to admit of this effe. But events fimilar to thefe occur, when dew appears in an open and level grafs field, during a ftill and ferene night. The upper parts of the grafs radiate their heat into regions of empty fpace, which confequently fend back no heat in return; its lower parts, from the fmalnefs of their conducting power, tranfmit little of the earth’s heat to the upper parts, which at the fame time receiving only a fmall quantity from the atmosphere, and none from any other lateral body, muft remain colder than the air, and condense into dew its watery vapour, if this be fufficiently abundant, in refpect to the decreafed temperature of the grafs.

“ This fubject may be further illuftrated by a reference to what happens in the experiment, which has been ufed to prove the reflection of cold.

“ In the fimpleft form of this experiment, a fmall body, the bulb of a thermometer, poffeffing the temperature of the atmosphere, is placed before a larger cold body, rendered equal in effect to one ftill larger, by means of a concave metallic mirror. In this fituation, the fmall body radiates heat to the larger, without receiving an equivalent from it, and, in confequence, becomes colder than the air through which its heat is fent, notwithstanding that it is continually gaining fome heat, both from the air which furrounds it, and from the walls and contents of the apartment, in which the experiment is made. Dew, therefore, would as readily form upon the thermometer in this experiment, as it would upon one fufpended in the open air at night, under a clear fky, provided that the two inftruments were equally colder than the atmosphere, and that this was in both cafes equally near to being replete with moisture.

“ Regarding now as eftablifhed, that bodies fituated on or near to the furface of the earth become, under certain circumftances, colder than the neighbouring air, by radiating more heat to the heavens, than they receive in every way, I fhall in the firft place offer a few remarks on the extent and ufe of this occurrence, and fhall afterwards apply the knowledge of it to the explication of feveral more of the appearances defcribed in the former part of this Effay, and

of some others, which have not hitherto been mentioned by me.

“Radiation of heat by the earth to the heavens must exist at all times; but, if the sun be at some height above the horizon, the degree of which is hitherto undetermined, and probably varies according to season, and several other circumstances, the heat emitted by it to the earth will overbalance, even in places shaded from its direct beams, that which the earth radiates upwards.

“In a calm and serene night, however, when consequently little impediment exists to the escape, by radiation, of the earth’s heat to the heavens, and when no heat can be radiated by the sun to the place of observation, an immense degree of cold would occur on the ground, if the following circumstances did not combine to lessen it. 1. The incapacity of all bodies to prevent, entirely, the passing of heat, by conduction, from the earth to substances placed upon them. 2. The heat radiated to these substances by lateral objects. 3. The heat communicated to the same substances by the air. 4. The heat which is evolved, during the condensation of the watery vapour of the atmosphere into dew.

“The extent of the effect of all these checks upon the production of cold, by the nightly radiation of heat from bodies on the surface of the earth, cannot, in the present state of our knowledge, be properly estimated; but facts shew that, notwithstanding their operation, the cold originating in this source must be often very considerable.

“I shall add, with the greatest diffidence, a few words upon a final cause of the radiation of heat from the earth at night, and upon some of the circumstances which modify its action, though fully conscious of the danger of error, which is always incurred in the attempt to appreciate the works of our Creator.

“The heat which is radiated by the sun to the earth, if suffered to accumulate, would quickly destroy the present constitution of our globe. This evil is prevented by the radiation of heat by the earth to the heavens, during the night, when it receives from them little or no heat in return. But, through the wise economy of means, which is witnessed in all the operations of Nature, the prevention of this evil is made the source of great positive good. For the surface of the earth, having thus become colder than the neighbouring air, condenses a part of the watery vapour of the atmosphere into dew, the utility of which is too manifest to require my speaking of it. I may remark, however, that this fluid appears chiefly where it is most wanted, on herbage, and low plants, avoiding, in great measure, rocks, bare earth, and considerable masses of water. Its production too, by another wise arrangement, tends to prevent the injury, that might arise from its own cause; since the precipitation of water, upon the tender parts of plants, must lessen the cold in them, which occasions it. I shall observe in the last place, that the appearance of dew is not confined to any one part of the night, but occurs during its whole course, from means the most simple and efficacious. For after one part of the air has deposited its moisture, on the colder surface of the earth, it is removed, in consequence of that agitation in the atmosphere which exists during its stillest states, and gives place to another having its quantity of water undiminished; and, again, as the night proceeds, a portion of air, which had before deposited all the moisture, which circumstances at that time permitted, is rendered fit, by the general increase of the cold of the atmosphere, to give out a fresh parcel, when it comes anew into contact with the ground.

“The first fact, which I shall here attempt to explain, is the prevention, either wholly or in part, of cold, from

radiation, in substances on the ground, by the interposition of any solid body between them and the sky. This evidently appears to arise in the following manner. The lower body radiates its heat upwards, as if no other intervened between it and the sky; but the loss, which it hence suffers, is more or less compensated by what is radiated to it, from the body above, the under surface of which possesses always the same, or very nearly the same temperature as the air.

“No direct experiments can be made to ascertain the manner, in which clouds prevent, or occasion to be small, the appearance of a cold at night, upon the surface of the earth, greater than that of the atmosphere; but it may, I think, be firmly concluded, from what has been said in the preceding article, that they produce this effect, almost entirely, by radiating heat to the earth, in return for that which they intercept in its progress from the earth towards the heavens. For although, upon the sky becoming suddenly cloudy during a calm night, a naked thermometer, suspended in the air, commonly rises two or three degrees, little of this rise is to be attributed to the heat evolved by the condensation of watery vapour in the atmosphere, as was supposed by Mr. Wilson; since, in consequence of the ceasing of that part of the cold indicated by the thermometer, which was owing to its own radiation to a clear sky, the temperature of the atmosphere may seem to increase 2°, or more, notwithstanding that it has received no real addition. Besides, the heat which is extricated by the condensation of vapour, during the formation of a cloud, must soon be dissipated; whereas the effect of greatly lessening, or preventing altogether, the appearance of a superior cold on the earth to that of the air, will be produced by a cloudy sky, during the whole of a long night.

“Dense clouds, near the earth, must possess the same heat as the lower atmosphere, and will therefore send to the earth as much, or nearly as much, heat as they receive from it by radiation. But similarly dense clouds, if very high, though they equally intercept the communication of the earth with the sky, yet being, from their elevated situation, colder than the earth, will radiate to it less heat than they receive from it, and may, consequently, admit of bodies on its surface becoming several degrees colder than the air. In the first part of this Essay, an example was given of a body on the ground becoming at night 5° colder than the air, though the whole sky was thickly covered with high clouds.

“Islands, and parts of continents close to the sea, being, by their situation, subject to a cloudy sky, will, from the smaller quantity of heat lost by them through radiation to the heavens at night, in addition to the reasons commonly assigned, be less cold in winter, than countries considerably distant from any ocean.

“Fogs, like clouds, will arrest heat, which is radiated upwards by the earth, and, if they be very dense, and of considerable perpendicular extent, may remit to it as much as they receive. Accordingly, Mr. Wilson found no difference at night, in very foggy weather, between the temperature of the surface of snow, and that of the air.

“In mists and low fogs it was found by professor Leslie, that the diminution of the sun’s heat is small, when compared with what occurs, when the sky is obscured by a dense body of clouds; and it will, I presume, be readily granted, that the same state of the atmosphere, which allows the heat of the sun to pass copiously, will also give a ready transit to heat radiated by the earth.”

From previous reasoning, the author concludes, therefore, that “fogs do not in any instance furnish a real exception to

the general rule, that whatever exists in the atmosphere, capable of stopping or impeding the passage of radiant heat, will prevent or lessen the appearance at night of a cold on the surface of the earth, greater than that of the neighbouring air.

"It follows also, from what has been said in this article, that the water deposited upon the earth, during a fog at night, may sometimes be derived from two different sources, one of which is a precipitation of moisture from a considerable part of the atmosphere, in consequence of its general cold; the other, a real formation of dew, from the condensation, by means of the superficial cold of the ground, of the moisture of that portion of the air, which comes in contact with it. In such a state of things, all bodies will become moist, but those especially which most readily attract dew in clear weather. I have had no opportunity, however, of trying this conclusion by the test of observation, since it occurred to me.

"When bodies become cold from radiation, the degree of effect observed must depend, not only on their radiating power, but in part also on the greater or less ease, with which they can derive heat, by conduction, from warmer substances in contact with them. Thus grass, on a clear and still night, was constantly colder, sometimes very much colder, than the gravel-walk, though a small quantity of sand, placed upon grass, was always nearly as cold as this substance. In this case, the difference in temperature between the gravel-walk and sand, evidently depended on the different quantities of heat which they received from the parts beneath. A like reason is to be given for dew appearing in greater quantity on shavings of wood, than on the same substance in a more dense and compact form; and for filamentous and downy substances becoming colder than all others, even than lamp-black, which is placed by Mr. Leslie, at the head of the best solid radiators of heat. For the lamp-black exposed by me, being about two lines in depth, possessed, in consequence, a fund of internal heat, which would more readily pass to its cold surface, than the heat of the lower parts of the downy substances would to their upper surface.

"Bodies, exposed in a clear night to the sky, must radiate as much heat to it during the prevalence of wind, as they would do if the air were altogether still. But in the former case, little or no cold will be observed upon them above that of the atmosphere, as the frequent application of warm air must quickly return a heat equal, or nearly so, to that which they had lost by radiation. A slight agitation of the air is sufficient to produce some effect of this kind; though, as has already been said, such an agitation, when the air is very pregnant with moisture, will render greater the quantity of dew, one requisite for a considerable production of this fluid being more increased by it, than another is diminished."

Theophrastus remarks, and the remark has been confirmed by other writers, that "the hurtful effects of cold occur chiefly in hollow places. If this be restricted to what happens on serene and calm nights, and it does not, I believe, hold true in any other circumstances, two reasons from different sources are to be assigned for it. The first is, that the air being stiller in such a situation, than in any other, the cold, from radiation, in the bodies which it contains, will be less diminished by renewed applications of warmer air; the second, that from the longer continuance of the same air in contact with the ground, in depressed places than in others, less dew will be deposited, and therefore less heat extricated during its formation. It will be seen in the last part of this Essay, that, in the East Indies,

depressions in the earth are artificially made, for the purpose of increasing the cold, which appears in serene nights. On this subject, however, it is to be observed, that if the depressed or hollow places be deep, in proportion to their horizontal extent, a contrary effect must follow; as a cave will occur more or less similar to that which existed in some experiments formerly related by me, in which a small portion of grass was surrounded by a hollow cylinder.

"An observation closely connected with the preceding, namely, that in clear and still nights, frosts are less severe upon hills, than in neighbouring plains, has excited more attention, chiefly from its contradicting what is commonly regarded an established fact, that the cold of the atmosphere always increases with the distance from the earth. This inferior cold of hills is evidently a circumstance of the same kind, with that ascertained by Mr. Pictet and Mr. Six, respecting the increasing warmth, in clear and calm nights at all seasons of the year, of the different strata of the atmosphere, in proportion as these are more elevated above the earth. As the greater cold of the lower air is the less complicated fact, I shall attempt to explain it in the first place. Mr. Pictet, indeed, furnishes an explanation himself, by ascribing it to the evaporation of moisture from the ground. But to shew that this is not just, it need only be mentioned, that the appearance never occurs in any considerable degree, except upon such nights as are attended with some dew, and that its great degrees are commonly attended with a copious formation of that fluid; since it cannot be thought, that the same stratum of air will deposit moisture on the ground, from an insufficiency of heat, at the very time it is receiving moisture from the ground, in the state of pellucid vapour, as this presupposes, that it is not yet replete with water."

Aristotle and Plutarch, and of late Mr. Jefferson, (Notes on Virginia,) have observed that dew is much less copious on hills than it is upon plains. In order to account for this fact, we may allow, at first, that the surface of the ground is in both situations equally colder than the air contiguous to it; yet, "as the production of dew must be in proportion to the whole depression of the temperature of the air which furnishes it, below what its heat had been in the preceding day, and as one part of this depression, the general cooling of the atmosphere, is much more considerable on the plain than on the hill, moisture must necessarily be deposited more copiously in the former than in the latter place. If the greater agitation of the atmosphere, and the less quantity of moisture, during clear weather, in its higher region than in the lower, be added, it may readily be inferred, that dew shall sometimes be altogether wanting on a hill, though abundant on a plain at its foot, agreeably to what has been actually observed by Mr. Jefferson.

"The leaves of trees often remain dry throughout the night, while those of grass are covered with dew. As this is a similar fact to the smallness of dew on hills, I shall in accounting for it do little more, than enumerate the circumstances on which it depends.

"1. The atmosphere is several degrees warmer near the upper parts of trees on dewy nights, than close to the ground. 2. The air in the higher situation is more agitated, than that in the lower. 3. The air at a little distance from the ground, from being nearer to one of its sources of moisture, will on a calm evening contain more of it, than that which surrounds the leaves of elevated trees. 4. Only the leaves of the very tops of trees are fully exposed to the sky. 5. The declension of the leaves from an horizontal position will occasion the air, which has been cooled by them, to slide quickly away, and be succeeded by warmer parcels.

6. The

6. The length of the branches of the trees, the tenderness of their twigs, and the pliancy of the footstalks of their leaves, will cause in the leaves an almost perpetual motion, even in flates of air that may be denominated calm. I have hence frequently heard, during the stillness of night, a rustling noise in the trees, which formed one of the boundaries of the ordinary place of my observations, while the air below seemed without motion.

“ Nearly in the same manner is to be explained, why shrubs and bushes also receive dew more readily than lofty trees.

“ Bright metals, exposed to a clear sky in a calm night, will be less dewed on their upper surface than other solid bodies; since of all bodies they will, in such a situation, lose the smallest quantity of heat by radiation to the heavens, at the same time that they are capable of receiving, by conduction, at least as much heat as any others from the atmosphere, and more than any others from the warmer solid substances, which they happen to touch.

“ If the exposed pieces of metal be not very small, another reason will contribute somewhat to their being later and less dewed than other solid substances. For, in consequence of their great conducting power, dew cannot form upon them, unless their whole mass be sufficiently cold to condense the watery vapour of the atmosphere; while the same fluid will appear on a bad conductor of heat, though the parts a very little beneath the surface are warmer than the air.”

It appears from the discoveries of professor Leslie, that the metals differ in their capacities of radiating heat; and hence will arise a difference among themselves with regard to their attraction of dew. Gold, silver, copper, and tin, as we have already said, resist the formation of dew more strongly, than other substances of the same class; but these metals, according to Mr. Leslie, radiate heat the most sparingly. On the other hand, lead, iron, and steel, which, according to the same author, radiate heat more copiously than the former metals, were found by Dr. Wells to acquire dew more readily. The same observations may probably be applicable to platinum and zinc. In the article DEW, we have already taken some notice of the opinion of those who maintain, that it rises from the earth at night. The first trace of this opinion, according to Dr. Wells, occurs in the Hist. Acad. Sci. for 1687. Gersten advanced it anew in 1733. It was embraced by Mufchenbroeck and Dufay; though the former soon admitted that dew sometimes falls. Mr. Webster of New England has adopted the same opinion. We refer those who wish to see the arguments for and against this opinion fully stated to Wells's Essay.

Agreeably to another opinion on the origin of dew, that which is found upon growing vegetables, is said to be the condensed vapour of the plants on which it appears. “ But this seems,” says our author, “ to be erroneous for several reasons. 1. Dew forms as copiously upon dead as upon living vegetable substances. 2. The transpired humour of plants will be carried away by the air which passes over them, when they are not sufficiently cold to condense the watery vapour contained in it; unless, which is almost never the case if mist does not already exist, the general mass of the atmosphere be incapable of receiving moisture in a pellucid form. Accordingly, on cloudy nights, when the air, consequently, can never be cooled more than a little below the point of repletion with moisture, by bodies in contact with it, dew is never observed upon any plants, that are elevated a few feet above the ground. 3. If a plant has become, by radiating its heat to the heavens, so cold, as to be enabled to bring the air in contact with it below the point of repletion with moisture, that which forms upon it, from its own

transpiration, will not then, indeed, evaporate. But other moisture will, at the same time, be communicated to it by the atmosphere; and when the difference in the copiousness of these two sources is considered, it may, I think, be safely concluded, that almost the whole of the dew, which will afterwards form on the plant, must be derived from the air; more especially when the coldness of a clear night, and the general inactivity of plants in the absence of light, both lessening their transpiration, are taken into account.

“ An experiment, however, has been applied to in proof, that the dew of plants actually does originate from fluid transpired by them; that, namely, in which a plant, shut up in an air-tight case, becomes covered with moisture. But this experiment, if attentively examined, will be found to have little weight. First, the inclosed plant being exempt from the cold, which its own radiation would have produced in its natural situation, on a dewy night, will transpire a greater quantity of fluid, than a similar plant exposed at the same time to the open air. Again, the small quantity of air, contained in the case, must soon be replete with moisture, after which, the whole of what is further emitted by the plant will necessarily assume the form of a fluid, whatever may be the condition of the external atmosphere; whereas, during even the clearest night, only a part of the smaller quantity of moisture, emitted by the exposed plant, will be condensed on its surface. In the last place, notwithstanding the circumstances which favour the appearance of moisture upon inclosed plants from their own transpiration, still the quantity observed on them is said to be, for I have made no experiment myself respecting this matter, much less considerable, than what is seen upon plants of the same kind, exposed to the air for the same time, during a calm and serene night.” For several appearances connected with dew, we are under a necessity of referring to the third part of Dr. Wells's Essay.

DEWAN, or DUAN, a term which has various significations in India. It denotes a place of assembly, a native minister of the revenue department, and chief justice of civil causes within his jurisdiction, and receiver general of a province. The term is also used to designate the principal revenue servant under an European collector, and even of a Zemindar. By this title, the East India company are receivers of the revenues of Bengal, under a grant from the Great Mogul. Accordingly Dewannu denotes the office or jurisdiction of a Dewan.

DEWEYSBURG, in *Geography*, a town of Caledonia county, in Vermont, having 200 inhabitants.

DEZPHOUL, a town of Persia, in Kuzistan, or Chuffistan, 28 miles W. of Shuster, containing nearly as many inhabitants as that city, and situated on the eastern bank of the Abzal, on a beautiful and spacious plain. Its only ornament is an elegant bridge of twenty-two arches, erected by command of Sapor, notorious for destroying as well as famous for building cities. The bridge is 450 paces in length, 20 in breadth, and about 40 in height. The piers are made of large stones, and the arches and upper parts of burnt brick.

DIAL-*Work of a Clock*, col. 2, l. 24, for Plate XXIII, r. Plate XVIII.

DIALLAGE. See MINERALOGY, *Addenda*.

DIAMOND, col. 4, l. 43, add—With a small portion of oxygen, as Sir Humphrey Davy has lately discovered.

DIAMOND. See DIAMOND, and MINERALOGY, *Addenda*.

DIANA, col. 3, l. 20 from the bottom, for 27 r. 30.

DIANELLA, in *Botany*, a poetical name, in honour of the sylvan goddess Diana, to whom Commerfon its author thought so beautiful an inhabitant of the woods peculiarly appropriate.

appropriate.—Lamarck *Dict.* v. 2. 276. *Illustr.* t. 250. *Juff.* 41. *Brown Prodr. Nov. Holl.* v. 1. 279. *Ait. Hort. Kew.* v. 2. 276.—Clafs and order, *Hexandria Monogynia*. *Nat. Ord. Coronaria*, Linn. *Asparagi*, *Juff. Aphode- lica*, Br.

Eff. Ch. Calyx none. Petals fix, spreading. Filaments tumid at the top. Berry of three cells, with many feeds.

Perennial herbs, with fibrous roots, grassy sheathing leaves, and paniced, drooping, blue flowers, whose anthers, as well as the spongy top of each filament, are yellow. The berries are blue, with shining feeds.

Seven species are found in New Holland; three are enumerated in *Hort. Kew.* A few examples will suffice.

D. ensifolia. Sword-leaved Dianella. *Redout. Lil. t. 1. Ait. n. 1.* (*D. nemorosa*; *Lamarck n. 1. Jacq. Hort. Schoenbr. v. 1. 49. t. 94. Dracena ensifolia*; *Linn. Mant. 63. Willd. Sp. Pl. v. 2. 158.*)—Leaves sword-shaped, smooth. Flowers loosely paniced.—Native of the East Indies. A frequent loose plant, about two or three feet high. Leaves an inch broad. Flowers green and white.

D. carulea. Blue Dianella. *Br. n. 1. Ait. n. 2. Curt. Mag. t. 505. Red. Lil. t. 79.*—Leaves with rough edges and keel. Panicle scarcely subdivided. Flower-stalks aggregate.—Native of Port Jackson, from whence it was brought very early. Leaves about half an inch broad. Flowers deep blue.

D. divaricata. Spreading Dianella. *Br. n. 6. Ait. n. 3.*—Leaves radical, nearly linear, smooth. Panicle repeatedly compound, spreading; ultimate branches zigzag, racemose. Bractes very minute.—Native of the fourth coast of New Holland. *Br.*

DIARBEKIR, infern—the ancient *Amida*; *1. ult.* after Rome, infern—It is said by *McKinnier* to contain 38,000 souls, most of whom are Turks. The elevation of the surrounding mountains, the windings of the Tigris, and height of the walls and towers, with the cupolas of the mosques, give it an air of grandeur superior to that of any other city, which this traveller has visited in this quarter of the world; *1. ult. N. lat. 37° 55' 30". E. long. 39° 52'.*

DIARBEKIR, *l. 2.* after Turkey, infern—and next to that of *Erzerow*, the most considerable pachaic of Armenia; *l. 21.* after *Curdistan*, add—It is situated between the Tigris and Euphrates, and separated from the dependencies of *Merdin* by a small river and a branch of mount *Mafius*. The whole of it is very mountainous and difficult of access; however it is interperfed with narrow and fertile valleys, and abounds with the most beautiful and romantic scenery:—*1. ult. r.* The principal town of this pachaic is *Diarbek*; which fee.

DIASPASIS, in *Botany*, *Brown Prodr. Nov. Holl.* v. 1. 586, a genus intermediate between *Scævola* and *Damiera*, (see those articles,) but perhaps most akin to the latter.

1. D. filifolia, from the fourth coast of New Holland, is the only species.

DIASPORE. See *MINERALOGY, Addenda.*

DICKINSON, in *Geography*, *l. 3, r. 1794.*

DICKSON. Add—Also, a county of West Tennessee, containing 4516 inhabitants, of whom 990 are slaves.

DIDACTYLUS, a species of *BRADYPUS*; which fee. See also *SLOATH.*

DIGHTON, *1. ult. r. 1659, &c.*

DIGITUS. Add—See *EXTREMITIES.*

DIKE, OPFA'S. See *DYKE.*

DIMERIA, in *Botany*, from its double spike.—*Brown Prodr. Nov. Holl.* v. 1. 204.—A grass chiefly distinguished

from *SACCHARUM*, (see that article,) by the flowers being all feilice, on a permanent, not jointed, stalk.

D. acinaciformis was found by *fr J. Banks*, in the tropical part of New Holland, and *Mr. Brown* has an East Indian species.

DINAS-MAWDDWY. In 1811, the hundred of *Tallybont* and *Mawddwy* contained 843 houses, and 4287 persons; 1964 being males, and 2323 females: 531 families employed in agriculture, and 200 in trade, &c.

DINGAS. Add—See *SCIND.*

DINGWALL. In 1811, the burgh and parish contained 278 houses, and 1500 persons; 647 being males, and 853 females: 158 families employed in agriculture, and 153 in trade and manufactures.

DINWIDDIE, *l. 4* and *5, r. 12,524* inhabitants, of whom 7442 are slaves.

DIOPSIDE. See *MINERALOGY, Addenda.*

DIOTIS, in *Botany*, from the two ears of its calyx, when in fruit.—*Schreb. Gen. 633. Willd. Sp. Pl. v. 4. 368. Ait. Hort. Kew. v. 5. 266.* (Ceratoides; *Tourn. Cor. 52.*)—Clafs and order, *Monocia Tetrandria*. *Nat. Ord. Holeraceae*, Linn. *Atriplices*, *Juff.*

Eff. Ch. Male, Calyx four-leaved. Cor. none. Female, Calyx of one leaf, with two horns. Style deeply cloven. Seed solitary, hairy at the base, concealed in the clofed calyx.

1. D. Ceratoides. Shrubby Diotis. *Willd. n. 1. Ait. n. 1.* (*Axyris Ceratoides*; *Linn. Sp. Pl. 1389. Jacq. Ic. Rar. t. 189.*)—Native of Siberia. A weak shrub, with linear-lanceolate leaves, and crowded inconspicuous flowers, of no beauty.

DIPLACRUM, from *διπλος*, double, and *ακρῖς*, a point. —*Brown Prodr. Nov. Holl.* v. 1. 240.—Clafs and order, *Monocia Triandria*. *Nat. Ord. Calamaria*, Linn. *Cyperoidea*, *Juff.*

Eff. Ch. Male, Calyx a chaffy scale, lateral. Cor. none. Female, Calyx of two equal, ribbed, permanent, pointed valves. Stigmas three. Nut spherical, without scales at the base, concealed in the clofed calyx.

1. D. caricinum. *Br. n. 1.*—Native of the tropical part of New Holland. *Banks*. A little grassy bog plant, with a leafy stem, and axillary as well as terminal tufts of flowers. Akin to *SCLERIA* and *CAREX*; see those articles.

DIPLANTHERA, from its apparently double anthers.—*Banks* and *Solander* in *Br. Prodr. Nov. Holl.* v. 1. 448.—Clafs and order, *Didynamia Angiospermia*. *Nat. Ord.* akin to *Solanaceae* and *Scrophularinae*? *Br.*

Eff. Ch. Calyx three-lobed; lateral lobes cloven. Corolla two-lipped; upper lip inversely heart-shaped, flat. Anthers of two divided, divaricated, linear lobes. Stigma two-lobed.

1. D. tetraphylla. *Br. n. 1.* *Banks Ic. ined. in Bibl. Linn.*—Native of the tropical part of New Holland. A tree, with an irregular spreading head, of round downy branches. Leaves four in a whorl, stalked, large, obovate, entire; cloven, and marked with two glands, at the base. Flowers numerous, large, and handsome, yellow, with long prominent stamens and style, in dense terminal panicles. Ripe fruit not known.

DIPLARRHENA, from having only two of the three stamens perfect.—*Labill. Nov. Holl.* v. 2. 117. *Voy. Engl. ed. v. 1. 169.* *Brown Prodr. Nov. Holl.* v. 1. 303.—Clafs and order, *Triandria Monogynia*. *Nat. Ord. Entata*, Linn. *Irides*, *Juff.*

Eff. Ch. Sheath of two leaves. Three inner segments of the corolla smallest; upper one vaulted. Stamens distinct; two of them converging under the vaulted segment

of the corolla; the third imperfect. Stigma two-lipped, in three deep segments. Seeds depressed.

1. *D. Moraea*. Labell. as above, t. 15. Br. n. 1. (*Moraea diandra*; Vahl Enum. v. 2. 154.)—Native of the fourth coast of New Holland, flowering in May. The flowers are very short-lived, white; their inner segments variegated. This plant differs from *PATERSONIA*, (see that article,) chiefly in the irregularity of its flower.

DIPLOPOGON, from διπλός, two-fold, and πογών, a beard.—Brown Prodr. Nov. Holl. v. 1. 176.—Class and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Eff. Ch. Calyx of two lax, membranous, awned valves, single-flowered. Corolla of two valves; outer with three awns, of which the middle one is twisted, unlike the rest; inner with two awns.

1. *D. setaceus*. Setaceous Diplopogon.—Gathered by Mr. Brown, on the southern coast of New Holland. A grass perfectly resembling *AMPHIPOGON laguroides*, (see that supplementary article,) in habit and inflorescence, the spike being capitate, and the outermost flowers likewise abortive, composing a kind of involucre. Brown.

DIP-MICROMETER, and **DIP-SECTOR**, instruments invented by Dr. Wollaston, to correct the variation of the real dip from that given in the tables; arising principally from the difference between the temperature of the sea and that of the atmosphere.

DIPODIUM, in *Botany*, from δίς, and ποὺς, alluding to the two separate stalks, or feet, by which the masses of pollen attach themselves to the stigma.—Brown Prodr. Nov. Holl. v. 1. 330.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Eff. Ch. Calyx-leaves and petals uniform, spreading. Lip three-lobed; disk bearded; base with a short spur. Column semi-cylindrical. Anther a terminal deciduous lid. Masses of pollen solitary in each cell, with an inner lobe, each attached by a separate thread to the gland of the stigma.

Leafless smooth herbs, growing on the ground, with a thick, branching root. Base of the stem sheathed with imbricated scales, more distant on its upper part, where they become bracteas. Flowers numerous, in a simple cluster, purple, very handsome. Two species are mentioned.

1. *D. punctatum*. Dotted Dipodium. Br. n. 1. *Dendrobium punctatum*; Sm. Exot. Bot. v. 1. 21. t. 12.)—Lower scales broadly ovate, acute, without a keel; upper split longitudinally. See *DENDROBIUM*, n. 10.

2. *D. squamatum*. Scaly Dipodium. (*Cymbidium squamatum*; Swartz Orch. in Schrad. N. Journ. v. 1. 76. Ophrys; squamata; Forst. Prodr. 59.)—Lower scales oblong, keeled; upper undivided at the base. Br.—Native of New Caledonia. Very nearly related to the first.

DIPSACEÆ, l. 3, after *cotyledons*, insert—two.

DIPTEROCARPUS, διπτερος, two-winged, and κάρπος; fruit.—“Gært. v. 3. 51. t. 188.” Roxb. Corom. v. 3. 10.—Class and order, *Polyandria Monogynia*. Nat. Ord. *Guttiferis*, Juss. affine.

Eff. Ch. Calyx inferior, five-cleft; two segments subsequently much enlarged. Petals five. Capitule ovate, of one cell. Seed solitary.

1. *D. turbinatus*. Wood-oil Dipterocarpus. Roxb. as above, t. 213.—Native of various countries eastward of Bengal, flowering early in the hot season, and famous for its liquid balsam, much used for painting houses and ships. This is copiously procured by wounding the trunk, and lighting a fire near the part. The tree is very large. Leaves alternate, stalked, ovate, acute, wavy or serrated,

smooth, from four to twelve inches long. Flowers in simple, axillary clusters, large, white, with yellow anthers. Wings of the calyx in fruit erect, oblong, three inches in length.

DISCHARGED WORK. See *PASTE-Work* and *DISCHARGING of Colour*.

DISS, l. 6, r. 348, and 2590.

VOL. XII.

DISTHENE. See *MINERALOGY, Addenda*.

DISTILLATION, col. 7, l. 22, &c. for Welter r. Welter.

DISTILLED WATERS, col. 2, l. 23 from bottom, for macerated water r. macerated in water.

DISTILLER, col. 2, l. 12 from bottom, r. 24 Geo. II. c. 40. Col. 3, l. 19, r. 14 Geo. III. c. 73. Col. 5, l. 24, r. 43 Geo. III. c. 81.

DIXFIELD, l. 2, for Cumberland r. Oxford. Add—it contains 403 inhabitants.

DIXMONT. Add—Also, a town of Maine, in the county of Hancock, having 337 inhabitants.

DIXVILLE, a township of Coos county, in New Hampshire, having 12 inhabitants.

DOAB, or **DOOAB**, denotes in India any tract of country included between two rivers.

DOCKING, in the *Manege*. See *CURTAILING*.

DODBROOKE, l. ult. r. 112, and 942.

DODECAGON. The demonstration annexed is misplaced, and belongs to **DECAGON**.

DOEMIA, in *Botany*, Brown Tr. of the Wern. Soc. v. 1. 50. (*Daemia*; Ait. Hort. Kew. v. 2. 76.) a genus of the *Asteriades*, differing from *SARCOSTEMMA*, (see that article,) in having the outer crown of the filaments in ten deep segments. It consists of *Cynanchum extensum*, Jacq. Ic. Rar. t. 54, (to which *C. bicolor*, Andr. Rept. t. 562, is very nearly related,) and *Aclepias cordata*, Forst. Egypt.-Arab. 49.

DOLGELLY, col. 2, l. 21 and 22 from bottom, r. 537 and 3064.

DOLOMITE. See *MINERALOGY, Addenda*.

DONCASTER, col. 2, l. 26 from bottom, r. 1438 and 6935.

DONEGAL, in America, l. 1, r. four; l. 3, r. 3156 and 2147; l. 4, 1327. Add—And one in Butler county, having 671 inhabitants.

DONIA, in *Botany*, so named by Mr. Brown, in memory of the late Mr. George Don, of Forfar, a most acute and indefatigable Scottish botanist.—Br. in Ait. Hort. Kew. v. 5. 82. Pursh 559.—Class and order, *Syngenesia Polygamia superflua*. Nat. Ord. *Compositæ*, Linn. *Corymbifera*, Juss.

Eff. Ch. Receptacle naked. Seed-down bristly, deciduous. Calyx imbricated, hemispherical.

1. *D. glutinosa*. Glutinous Donia. Ait. n. 1. (After glutinosus; Cavan. Ic. v. 2. 53. t. 168. *Doronicum glutinosum*; Willd. Sp. Pl. v. 5. 2115.)—Leaves ovate-oblong, sharply serrated, glutinous, as well as the upright-sealed calyx.—Native of Mexico. A green-house shrub, raised from Spanish seeds by Mr. Lambert, flowering in August and September. The leaves are sessile. Flowers terminal, solitary, near two inches broad, yellow, with many rays.

2. *D. squarrosa*. Snake-headed Donia. Pursh n. 1. Curt. Mag. t. 1706.—Leaves linear-oblong, serrated. Calyx glutinous, its scales with recurved cylindrical points.—Discovered by governor Lewis, in meadows on the banks of the Missouri, flowering in August and September. Stem herbaceous.

herbaceous. *Leaves* much narrower than the foregoing. *Flowers* yellow, with a balsamic scent.

DONNINGTON, l. 19, r. 1811; l. 20, r. 316; l. 21, r. 1528.

DOODIA, in *Botany*, named after Mr. Samuel Doody, F.R.S. one of the earliest and best British Cryptogamists. He was an apothecary in London, and died in 1706.—Brown Prodr. Nov. Holl. v. 1. 151. Ait. Hort. Kew. v. 5. 523.—We fear this genus cannot be separated from WOODWARDIA; see that article.

DOOSHAK, in *Geography*, the present capital, and the residence of the prince of Seitan, in N. lat. 31° 8'. E. long. 63° 10', eight or nine miles from the river Heermund. See ZARANG.

DORAK. See FELAHI.

DORCHESTER, col. 4, l. 29, r. 1811; l. 20, r. 3020 and 15,980.

DORCHESTER, in America, l. 10, r. 18,108 and 5032.

DORCHESTER TOWNSHIP, l. 2, r. 537; l. ult. r. 2930.

DORCHESTER, a town, or rather a village, formerly a city, of Oxfordshire, between Benfon and Oxford. By the returns of 1811, the parish contained 148 houses, and 754 persons; 358 being males, and 396 females: 93 families employed in agriculture, and 47 in trade, manufactures, and handicraft.

DORKING, l. 29, r. 1811—589—3259.

DORSET, l. 4, r. 1294.

DORSETSHIRE, l. 15 and 16, r. 23,210 and 124,693.

DOVER, col. 9, l. 21, r. 9674 and 1780.

DOVER, in America, l. 3, r. 548; l. 11, r. 2228; l. 26, r. 1882; l. ult. r. 1882 inhabitants. Add—Also, a township in the district of Ohio, in the county of Tuscarawa, containing 461 inhabitants.

DOUGLAS, in America, l. 5, r. 1142; l. 11, r. 687. Add—Also, a township of Bucks county, in Pennsylvania, having 660 inhabitants.

DOWN. Add—containing 1501 inhabitants.

DOWNHAM, l. 25 and 26, r. 1811—361—1771.

DOWNTON, l. 24, r. 543—2624.

DRACOPHYLLUM, in *Botany*, so called from the resemblance of its leaves to *Dracena Draco*.—Labill. Voy. Engl. ed. v. 2. 219. t. 40. Br. Prodr. Nov. Holl. v. 1. 555.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Epariides*, Br.

Eff. Ch. Calyx five-cleft. Corolla tubular; limb in five deep spreading segments, beardless. Nectary five scales beneath the germen. Receptacles of the seeds hanging loose from the top of the central column. Br.

Some flowers are six-cleft, as Labillardiere observed in his *D. verticillatum*, found in New Caledonia. Mr. Brown, who met with four species in New Holland, remarks, that Forster's *Eparis longifolia* and *rosmarinifolia*, Prodr. 13, natives of New Zealand, belong to this genus.

DRACUT, l. 2, after county, r. and state of Massachusetts; l. ult. r. 1301.

DRAG. See DROWNING.

DRAMATIC *Music of the Greeks*, col. 2, l. 5 from the close, r. *makts*.

DRAYTON. Add—The part of this parish that lies in Salop county contained, by the return in 1811, 599 houses, and 3370 persons; the other part, formerly denominated Tyryeh, now Drayton-in-Hales, situated in the hundred of North Pirehill, in the county of Stafford, consists of three townships, having 104 houses, and 607 inhabitants.

DRESDEN, in America. Add—It contains 1096 inhabitants.

DRESSING, in *Rural Economy*, and the *Manege*, de-VOL. XXXIX.

notes the periodical application of friction, by means of brushes, cloths, &c. to the hides of animals, with a view both to cleanliness and health. (See CURRYING.) Friction on the surface of the body, by means of the curry-comb and brush, contributes to promote the circulation of the fluids, and that insensible perspiration through the pores of the skin, which greatly conduce to the health and activity of the animal. Columella observes, that the bodies of cattle ought to be rubbed down daily, as well as the bodies of men; and frequently it does them more good to have their backs well rubbed down, than to have their bellies filled with large quantities of provender. Of the practice which is so common on the post-roads of throwing pailsful of cold water on horses when they are over-heated at the close of a stage, Mr. Clark speaks doubtfully; although it is said that no bad consequences ensue, probably because they have little interruption of exercise; but he is of opinion, that if they are well rubbed down after exercise, there will be no occasion for washing, or rather drenching them with cold water. See HORSE.

DRIFFIELD, l. 4, r. 399, and 1857.

DRIMIA, in *Botany*, from $\delta\rho\mu\omega\varsigma$, *acid*, alluding to the qualities of the root.—Jacq. Coll. v. 5. 38. Willd. Sp. Pl. v. 2. 165. Ait. Hort. Kew. v. 2. 281.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Coronaria*, Linn. *Asphodeli*, Juss.

Eff. Ch. Calyx none. Corolla inferior, bell-shaped, in six deep revolute segments. Stamens inserted into the corolla. Stigma three-lobed. Capsule abrupt, somewhat triangular. Seeds few, oblong.

Five species, from Southern Africa, are described by Jacquin and Willdenow, and figured in Jacq. Ic. t. 373—377. They have scaly *bulbs*, linear-lanceolate *leaves*, coming after the tall, stalked *cluster*, of numerous greenish *flowers*. *D. elata*, Curt. Mag. t. 822, and *D. pusilla*, Jacq. t. 374, are the only ones in Hort. Kew.

DROITWICH, l. *penult.* r. 423, and 2079.

DROMORE, l. 3, r. 1295.

DRONFIELD, l. 4, r. 267 and 1343.

DRYANDRA, in *Botany*, received its name from Mr. Brown, in honour of his friend Jonas Dryander, M.A. a distinguished pupil of the great Linnæus, who succeeded the celebrated Solander in the place of librarian to Sir Joseph Banks; and after rendering eminent services to science, died under the roof of his illustrious friend and patron, in October 1810, aged 62. Mr. Dryander has erected to himself a lasting monument in his *Catalogus Bibliothecæ Historico-naturalis Josephi Banks*, the most elaborate and complete work of the kind, and the most perfect specimen of correct execution, that perhaps any department of science can boast. His papers on *Begonia*, *Lindlæa*, and other subjects, in the Transactions of the Linnæan Society, richly entitle him to botanical commemoration; to say nothing of his abilities as editor of the first edition, and part of the second, of Mr. Aiton's *Hortus Kewensis*, as well as of Dr. Roxburgh's *Plants of Coromandel*; or his various services to natural science in other respects. Thunberg had long ago published a *DRYANDRA* (see our former article); but that proving not distinct from Forster's *Aleurites*, previously established, Mr. Brown has happily chosen a most distinct genus, next akin to *BANKSIA*, and scarcely less rich in number and beauty of species.—Brown Tr. of Linn. Soc. v. 10. 211. t. 3. Prodr. Nov. Holl. v. 1. 396. Ait. Hort. Kew. v. 1. 219.—Class and order, *Tetrandria Monogynia*. Nat. Ord. *Aggregata*, Linn. *Protocæce*, Juss. Brown.

Gen. Ch. *Common Calyx* hemispherical, of numerous, permanent, imbricated scales, many-flowered. *Cor.* of one petal,

DRYANDRA.

petal, in four deep linear segments, at length separating more or less completely, slightly dilated and concave at their summits. Nectary four scales at the base of the germen. *Stam.* Filaments four, very short, inserted into the base of the cavity of each petal; anthers linear-oblong. *Pist.* Germen superior, very small, of two single-feeded cells; style cylindrical, rigid, erect, about the length of the corolla; stigma undivided. *Peric.* Follicle woody, obliquely turbinate, of two shallow cells; the partition unconnected, deeply cloven transversely, elastic. *Seeds* solitary, compressed, oblong, with a lateral crescent-shaped membranous wing. *Common Receptacle* flat, beset with oblong scales or bristles, rarely wanting.

Eff. Ch. Corolla of one petal, four-cleft, bearing the stamens in the hollows of its segments. Nectary four scales at the base of the germen. Follicle woody, of two single-feeded cells, with a cloven moveable partition. *Common calyx* imbricated, many-flowered. Receptacle flat.

This genus consists of New Holland shrubs, mostly of humble growth; their *branches*, if any, either scattered or umbellate. *Leaves* scattered, pinnatifid or cut, alike in young or old plants. *Flowers* solitary, sessile, terminal, rarely lateral, encompassed with crowded *leaves*, of which the innermost are sometimes diminished, or as it were imperfect, and accompanied at the base with close-pressed *bractes*, some of them occasionally furnished with a terminal appendage. *Style* for the most part hardly longer than the corolla, and not forced into a curve as in *Banksia*.

We follow Mr. Brown's names and numbers throughout.

1. *D. floribunda*. Many-flowered Dryandra. Ait. n. 1.—Leaves wedge-shaped, deeply and sharply serrated. Calyx-scales striated; the outermost nearly smooth. Tips of the corolla smooth. Stigma obtuse, slightly club-shaped.—Native of Lewin's land, growing on stony hills. Mr. Menzies favoured us with a specimen from King George's found. This shrub flowers at Kew most part of the year. The *branches* sometimes bear a few long, loose, spreading hairs. *Leaves* sessile, rigid, an inch and a half or two inches long, finely reticulated on both sides, the minute interlicles of the veins curiously depressed beneath. *Flowers* terminal, in a close cylindrical head, resembling some *Thistle* or *Serratula*, shorter than the crowded surrounding leaves. *Calyx* brown, of many sharp imbricated scales, the inner ones gradually longest, and hairy. *Corolla* thrice as long, yellow, externally hairy, except at the tips lodging the *stamens*, which are smooth, keeled, obtuse, minutely hooded. Mr. Brown observes that the scales of the *receptacle*, separating the flowers, are sometimes wanting.

2. *D. cuneata*. Wedge-leaved Dryandra. Ait. n. 2.—Leaves wedge-shaped, deeply serrated, spinous, stalked. All the calyx-scales even and silky. Tips of the corolla bearded. Stigma slender-awl-shaped, acute.—Found by Mr. Brown, on stony hills in Lewin's land. He notices two varieties; one with *leaves* scarcely an inch and a half long, whose three terminal teeth are all nearly equal; another, which may possibly be a distinct species, with *leaves* two inches long, whose dilated extremity has the middle tooth shortest, the adjoining sinuses broader.

3. *D. armata*. Acute-leaved Dryandra. Ait. n. 3.—Leaves pinnatifid; lobes triangular, flat, divaricated, straight, spinous-pointed; reticulated with naked veins beneath: the terminal one longer than the next. Branches, and tips of the corolla, smooth. Style downy at the base. Stigma awl-shaped, furrowed.—Found by Mr. Brown, on rocky hills in Lewin's land. Mr. Good sent this species to Kew in 1803, but it has not yet flowered there, nor have we seen a specimen.

4. *D. falcata*. Curve-leaved Dryandra. Br. n. 4.—Leaves pinnatifid; lobes triangular-awl-shaped, divaricated, falcate and recurved, spinous-pointed; reticulated with naked veins beneath: the terminal one shorter than the next. Branches downy. Tips of the corolla, as well as the style, longitudinally smooth. Stigma club-shaped, without furrows.—Found by Mr. Brown, in the same country as the last.

5. *D. formosa*. Splendid Dryandra. Br. Tr. of Linn. Soc. v. 10. 213. t. 3. Ait. n. 4.—Leaves linear, elongated, deeply pinnatifid; lobes unequally triangular, pointlets, flat; downy beneath. Calyx-scales hairy; the innermost linear-oblong, reflexed. Receptacle chaffy.—Discovered by Mr. Menzies, near King George's found. Mr. Brown met with it likewise, in barren ground near the coast of Lewin's land. This truly beautiful species was sent to Kew, by Mr. Good, in 1803, and it is marked by Mr. Aiton as flowering there most part of the year. The *leaves* are stalked, from four to six inches long, and barely one-third of an inch broad, cut to the mid-rib, into numerous, close, regular segments, whose upper margin is direct, lower curved; the under side finely downy, snow-white, turning rusty with age, or long keeping. *Stem* branched, downy. *Flowers* terminal, two or three inches in diameter, embossed in leaves. *Calyx-scales* purplish-brown, striated and naked on the inside. *Flowers* of a tawny yellow, clothed with long shining hairs to the very point. *Style* yellow, stout and smooth. *Stigma* cylindrical, furrowed. *Follicles* small; tapering and hairy at the base; rounded at the margin; gaping widely, overtopped by the linear scales of the *receptacle*.

6. *D. mucronulata*. Pointed-lobed Dryandra. Br. n. 6.—Leaves linear, elongated, deeply pinnatifid; lobes equally triangular, pointed, flat; downy beneath. Calyx-scales downy; inner ones linear, pointed. Receptacle chaffy. *Stem* scarcely branched.—Gathered by Mr. Brown at Lewin's land, in low stony ground.

7. *D. plumosa*. Feather-flowered Dryandra. Ait. n. 5.—Leaves linear, elongated, deeply pinnatifid; lobes equally triangular, pointed, flat; downy beneath; slightly revolute at the margin. Inner calyx-scales with feathery tips. Receptacle without scales.—Discovered by Mr. Brown, on the rocky sides of hills, in Lewin's land. Sent to Kew by Mr. Good, in 1803, but has never bloomed there.

8. *D. obtusa*. Obtuse-leaved Dryandra. Ait. n. 6.—Leaves linear, pinnatifid, longer than the downy recumbent stem; lobes triangular, obtuse; downy beneath; thickened and recurved at the edges. Outer calyx-scales ovate; inner linear-oblong.—Gathered by Mr. Brown in Lewin's land, in dry open situations near the shore. This also was sent to Kew, at the same time as the last, but has never yet produced flowers.

9. *D. nivea*. White-leaved Dryandra. Ait. n. 7.— (“*Banksia nivea*; Labill. Voy. v. 1, 412.” t. 24. Nov. Holl. v. 2. 118.)—Leaves linear, pinnatifid, about as long as the smooth stem; lobes unequally triangular, acute, pointed; white and mealy beneath; recurved at the margin. Calyx-scales linear-lanceolate, smooth, fringed. Corolla hairy from top to bottom, much shorter than the style.—Gathered by Mr. Menzies at King George's found; by Labillardiere and Brown in rocky places near the coast of Lewin's land, flowering in December. The *stem* is usually from one to three inches high, greatly overtopped by the very long, narrow, erect *leaves*, which are not quite so deeply pinnatifid as most of the foregoing; each lobe has two or three prominent ribs beneath, and is clothed on that side with a snow-white mealy pubescence, unaltered by time in our original specimen. *Flowers* solitary, sessile among the leaves,

leaves, smaller than those of *D. formosa*, with a purplish-brown calyx, and yellow, or tawny corolla. Style purplish, angular, smooth. Stigma small, pyramidal, obtuse, not well represented in the plate; at least not in our English edition. This flowers at Kew from July to September. Mr. Brown notices a variety in which the lobes of the leaves are somewhat divaricated, single-ribbed, and the stigma hardly thicker than the style.

10. *D. longifolia*. Long-leaved Dryandra. Ait. n. 8. —Leaves linear, pinnatifid, very long, acute; downy beneath; tapering and entire at the base; lobes triangular, ascending, decurrent, recurved at the margin. Calyx-fcales linear, awl-pointed, smooth, fringed. Corolla woolly at the base; downy upwards; rather hairy at the tips. Stem downy.—Discovered by Mr. Brown, on rocky hills in Lewin's land. The pubescence of the backs of the leaves is greyish, not white. This plant was raised at Kew in 1805, but has not yet borne any flowers.

11. *D. tenuifolia*. Slender-leaved Dryandra. Ait. n. 9. —Leaves linear, elongated, pinnatifid, rather abrupt; snow-white beneath; entire at the base, and tapering into a foot-stalk; lobes triangular, decurrent, divaricated, recurved at the margin. Calyx as long as the flowers, downy; outer scales ovato-lanceolate. Corolla almost as long as the style; woolly at the base; smooth upwards; slightly silky at the tips. Stem smooth.—Gathered by Mr. Brown, in heathy ground at Lewin's land. It flowers at Kew from March to May.

12. *D. pteridifolia*. Brake-leaved Dryandra. Br. n. 12. —Leaves deeply pinnatifid, longer than the downy stem; lobes linear, acute, pointed, revolute, dilated at their base. Calyx-scales downy, ovate.—Gathered by Mr. Brown, in Lewin's land, on the stony sides of hills.

13. *D. blechnifolia*. Blechnum-leaved Dryandra. Br. n. 13. —Leaves deeply pinnatifid, longer than the downy stem; lobes linear, obtuse, slightly pointed, three-ribbed, somewhat revolute, scarcely dilated at the base.—Gathered near King George's found by Mr. Menzies, to whom we are obliged for a specimen, without flowers, with which Mr. Brown likewise was unacquainted; but the resemblance of the plant to the last-described, induced him to consider it as belonging to the present genus. The short stem is clothed with dense, soft, rusty pubescence. Leaves resembling a *Cycas* in texture, as well as form, though only a foot high; the early ones smaller, with very broad rounded lobes, clothed beneath with white woolly down; the pubescence of the more full-grown leaf only, in our specimen, is become rusty.

DRYMOPHILA, from *δρυμος*, a grove, and *φιλον*, to love, alluding to its place of growth.—Br. Prodr. Nov. Holl. v. 1. 292.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Smilacaceae*, Br.

Eff. Ch. Calyx none. Petals six, equal, spreading, deciduous. Stamens inserted into the receptacle. Style deeply three-cleft, revolute. Berry of three cells, with many seeds.

1. *D. cyanocarpa*. Blue-berried Drymophila.—Found by Mr. Brown, in Van Diemen's island. Root perennial, creeping. Stem erect, mostly simple. Leaves twisted. Flowers white, stalked, solitary, axillary or terminal. Br.

DUBASHI, a name applied at Madras to the same person who is denominated Banian in Bengal: it signifies a person who can speak two languages.

DUBLIN, in America, l. 4, r. 1184; l. 8, r. 2194; l. 10, r. 970. Add—Also, a township of Bedford county, in Pennsylvania, having 820 inhabitants.

DUBOISIA, in Botany, in memory of Mr. Dubois, a botanist of the time of Dillenius, who appears, by Ray's

Synopsis, ed. 3. 17, to have had a garden at Mitcham in Surrey, and whose son, or brother, Charles, was an assiduous cryptogamist. His copy of Buxbaum is in our hands.—Br. Prodr. Nov. Holl. v. 1. 448.—Class and order, *Dinodamia Angiospermia*. Nat. Ord. *Luridae*, Linn. *Solanaceae*, Brown.

Eff. Ch. Calyx two-lipped, short. Corolla bell-shaped; limb in five deep, nearly equal, segments. Stamens in the tube, with the rudiment of a fifth. Stigma capitate, notched. Berry of two cells, with many kidney-shaped seeds.

1. *D. myoporoides*. Br.—Native of Port Jackson. A smooth shrub, with alternate undivided leaves, and white, panicled, axillary flowers, producing little black berries.

DUBUDU. See DUBDU.

DUCHESNEA, in Botany, a genus announced at the end of our article FRAGARIA, and since published in Tr. of Linn. Soc. v. 10. 371. It was supposed to differ essentially from *Fragaria* and *Potentilla*, (with both which the calyx agrees, and with the latter more particularly the habit,) in having the compound berry of a *Rubus*. Some garden specimens have led us to suspect an error in botanists who have described the ripe fruit, which in those specimens was certainly that of *Fragaria*, a feculent receptacle studded with dry seeds. Whether the latter becomes pulpy at any more advanced period, remains to be proved. Meanwhile this plant stands as *F. indica*, in Ait. Hort. Kew. v. 3. 273.

DUCK CREEK, in Geography, a hundred of Kent county, in Delaware, containing 3690 inhabitants, of whom 167 are slaves.

DUDLEY, l. 3, r. 2621 houses, and 13,925 inhabitants. Add—Dudley is partly in Offlow hundred, Staffordshire, in which Dudley is locally situated.

DUDLEY, in America, l. 2, r. 1220.

DUEL. At the close, add—Duelling, says a late excellent writer, in the modern sense of the word, exclusive of casual frays and single combats during war, was unknown before the 16th century. But we find one anecdote, which seems to illustrate its derivation from the judicial combat. The dukes of Lancaster and Brunfwick, having some differences, agreed to decide them by duel before John, king of France. The lists were prepared with the solemnity of a real trial by battle; but the king interfered to prevent the engagement. The barbarous practice of wearing swords as a part of domestic dress, which tended very much to the frequency of duelling, was not introduced till the latter part of the 15th century. Our author says, that he can find only one print in Montfaucon's Monuments of the French Monarchy where a sword is worn without armour before the reign of Charles VIII.; though a few as early as the reign of Charles VI. have short daggers in their girdles. Hallam's State of Europe during the Middle Ages, vol. ii. ch. 9. part i. p. 441. London, 1818.

DUEREN. See DEUREN.

DUFUREA, in Botany, so named in honour of a French botanist.—Achar. Syn. 246. "Lichenogr. 103. t. 11. f. 2." A genus of the order of *Lichenes*, composed of *L. flammeus*, Linn. Suppl. 451. Hoffm. Pl. Lich. t. 3. f. 1; *L. madreporeiformis*, Wulf. in Jacq. Coll. v. 3. t. 3. f. 2; and three other species. The frond is tubular, branched, membranous; fields terminal, with a border from the frond. We must shelter ourselves under the doubt, expressed by the author himself, respecting this genus.

DUKE'S COUNTY, l. 5, r. 3290.

DULVERTON, l. 11, r. 204 and 1035.

DULWICH. Add—See CAMBERWELL and PECKHAM.

DUMBARTON. By the return of 1811, the burgh and parish of Dumbarton contained 363 houfes, and 3121 perfons; 1373 being males, and 1748 females: 93 families employed in agriculture, and 524 in trade and manufactures. The fhire of Dumbarton contained 3218 houfes, and 24,189 perfons; 11,369 being males, and 12,820 females: 1123 families employed in agriculture, and 2689 in trade, manufactures, and handicraft.

DUMBLANE. In 1811, the parish contained 473 houfes, and 2733 perfons; 1272 being males, and 1461 females: 163 families employed in agriculture, and 293 in trade, &c.

DUMFRIES. In 1811, the burgh and parish contained 1445 houfes, and 9262 perfons; 4103 being males, and 5159 females.

DUMFRIESHIRE. By the return of 1811, this county contained 11,660 houfes, and 62,960 perfons; 29,347 being males, and 33,613 females: 3862 families employed in agriculture, and 4435 in trade, manufactures, and handicraft.

DUMMER, l. 2, for Grafton r. Coos; add—containing 7 inhabitants.

DUMMERSTOWN, l. 3, r. 1704.

DUNBAR, in Scotland. The burgh and parish, in 1811, contained 664 houfes, and 3965 perfons; 1661 being males, and 2304 females: 263 families employed in agriculture, and 305 in trade and manufactures.

DUNBAR, a township of Fayette county, in Pennsylvania, containing 2066 perfons, of whom, in 1810, 7 were flaves.

DUNBARTON, l. 3, r. 1256.

DUNDEE, col. 2, l. 7 from the bottom, r. 1811—29,614, and add—the number of houfes 2482.

DUNFERMLINE, col. 2, l. 41, r. 1811—11,649; add—and the number of houfes in the burgh and parish 1810.

DUNKARD, a township of Greene county, in Pennsylvania, having 1055 inhabitants.

DUNKELD. The town and parish, in 1811, contained 126 houfes, and 1360 perfons; 651 being males, and 709 females. The parish of Little Dunkeld contained 637 houfes, and 2982 perfons; 1448 being males, and 1534 females.

DUNMOW, GREAT, col. 2, l. 14 and 15, r. 1811—397—2015.—*Little,* l. 4, add—The number of houfes, in 1811, was 45, and of perfons 264.

DUNNET. In 1811, the parish contained 311 houfes, and 1398 perfons; 638 being males, and 760 females.

DUNSE. In 1811, the parish contained 462 houfes, and 2424 perfons; 1174 being males, and 1250 females.

DUNSTABLE, l. 6, r. 1049; l. 9, r. 475.

DUNSTAPLE. In 1811, the parish contained 926 houfes, and 1616 perfons; 690 being males, and 926 females.

DUODENUM. See **INTESTINES.**

DUPLIN, l. 4, r. 7863—2416.

DURAND, a township of Coos county, in New Hampshire, having 62 inhabitants.

DURBAR, denotes in India the court, hall of audience, or levee.

DURHAM, col. 2, l. 9, r. 29,033—177,625; l. 10, r. 83,671 and 93,954.

DURIAM City, l. ult. r. 932, and 6763.

DURHAM, in America, l. 4, r. 1772; l. 9, r. 1449; l. 11, for New Haven r. Middlesex; l. 15, r. 1101; l. 17, r. 404.

DURSLEY, l. 15, for town r. parish, 489; l. 16, r. 2580—365 families.

DUTCHESS COUNTY, l. 7, r. in 1810, was 51,363—1262.

DUXBOROUGH, or **DUXBURY,** l. 5, r. 2201.

DUXBURY, l. 3, r. 326.

DYBERRY, a township of Wayne county, in Pennsylvania, having 318 inhabitants.

DYSART, l. 15, insert—The borough and parish, by the return of 1811, contained 777 houfes, and 5506 perfons. The town of Dyfart contained 136 houfes, and 1578 perfons: the lower, &c.

DYSPHANIA, in *Botany*, *δυσφανία*, *inconspicuous*.—Br. Prodr. Nov. Holl. v. 1. 411.—Clafs and order, *Polygamia Monoecia*, or rather *Diandria Monogynia*. Nat. Ord. *Holeraceæ*, Linn. *Ghenopodium affine*, Br.

Eff. Ch. Calyx deeply three-cleft, coloured. Cor. none. Stigma fimple. Capsule turbinate, attached to the feed, and encamped with the enlarged calyx. Molt flowers female.

1. *D. littoralis*. A tropical New Holland herb, smooth, very diminutive, with alternate entire *leaves*, and axillary tufts of white *flowers*, twenty of which would hardly make the bulk of a pin's head. One only in each tuft is furnished with *filaments*.

E.

EAGLE, in *Geography*, a township of Adams' county, in Ohio, containing 801 inhabitants.—Also, a township of St. Clair, in the Illinois territory, having 384 inhabitants.

EAGLE, Bald, a township of Centre county, in Pennsylvania, having 1146 inhabitants.—Also, a township of Lycoming county, in the same ftate, having 246 inhabitants.

EAGLE Island. Add—Also, an island in the diftrict of Maine, and county of Hancock, having 9 inhabitants.

EAR, Diseases of. See **DEAFNESS, TYMPANUM, TUBE, Eustachian,** and **OTALGIA,** the latter of which articles will be found in the *Addenda*.

EARL, in *Geography*, a township of Lancafter county; in Pennsylvania; containing 4218 inhabitants.—Also, a township

township of Berks county, in the same state, having 794 inhabitants.

EARTH, col. 19, l. 12 from bottom, for 7935 *r.* 3967½, and for 7882 *r.* 3941.

EARTHEN WARE. See DELF and POTTERY.

EASTBOURNE, l. 13, after parish, insert—which contains 120 houses, and 720 inhabitants.

EAST DISTRICT, a township of Berks county, in Pennsylvania, having 805 inhabitants.

EASTHAM, l. 9, *r.* 752.

EASTON, col. 2, l. 1, *r.* 1657.

EASTON, l. 5, *r.* 1557.

EAST PORT. Add—It contained, in 1810, 1511 inhabitants.

EAST TOWN, l. 2, *r.* 587.

EAST WHITELAND, l. 2, *r.* 779.

EATON, l. *penult.* *r.* 535.

EATONTOWN, a town of Putnam county, in Georgia, having 73 inhabitants.

ECHENEIS, l. 4, add—Or, according to Dr. Shaw, head furnished above with a flat, ovate, transversely falcated shield, gill-membrane six-rayed, and body without scales.

ECLIPTIC, *Obliquity of*, col. 2, l. 6 from bottom, add—And he found the obliquity of the ecliptic at the summer solstice to be 23° 27' 51" .5, and at the winter solstice 23° 27' 47" .37. The difference he conceives to depend upon refraction. At the observation of the summer solstice in 1812 with the new mural circle, he found the obliquity of the ecliptic to be 23° 27' 52" .25; from that of the winter solstice he deduced it 23° 27' 47" .35.

ECTROSIA, in *Botany*, from *εκτροσις*, an abortion, alluding to the number of abortive florets.—Brown Prodr. Nov. Holl. v. 1. 185.—A genus of grasses, allied to ELEUSINE, (see that article,) and to *Chloris* of Swartz, all whose characters require investigation.

EDDINGTON, in *Geography*, a town of America, in Maine and county of Hancock, having 205 inhabitants.

EDDYSTONE, col. 2, l. 1, for 8vo. *r.* folio.

EDEN, in America, l. 4, add—containing 657 inhabitants; l. 5, add—containing 224 inhabitants.

EDESSA. Add—Edessa, at present denominated Orfa, after having been the residence of the Courtneys, counts of Edessa, and having been taken by Zenghi or Zingi, was sacked by the Moguls in the 13th century, and by Timur in the 804th year of the Hegira. It is now subject to the grand seignior, and the residence of a pacha of two tails. It is situated in a barren country, 67 miles from Bir, and 232 from Diarbekr. It is surrounded by a stone wall, and defended by a citadel. The houses are well built, and the inhabitants, composed of Turks, Arabs, Armenians, Jews, and Nestorians, are said to amount to about 20,000 souls. The chief ornaments of this city are, a mosque, consecrated to Abraham, and the cathedral of the Armenians, now decayed.

EDGARTON, l. 7, *r.* 1365.

EDGCOMB, l. 3, *r.* 1288; l. 9, *r.* 12,423 and 5107.

EDGEFIELD. Add—It contains 23,160 inhabitants, of whom 8576 are slaves.

EDGMONT, l. 2, *r.* 611.

EDINBURGH, col. 7, l. 7, add—By the parliamentary return of 1811, the city and burgh of Edinburgh contained 7110 houses, and 102,987 inhabitants; 43,982 being males, and 59,005 females. The shire of Edinburgh contained 8679 houses, and 45,620 inhabitants; 21,022 being males, and 24,598 females.

EDINGTON. In 1811 the parish contained 85 houses, and 417 persons; 195 being males, and 222 females.

EDISTO, *r.* PONTOX.

EDWARDSIA, in *Botany*, (see that article,) is thus defined by Mr. Brown, in Ait. Hort. Kew. v. 3. 1.—Caylx five-toothed. Corolla papilionaceous. Legume with four wings and many seeds.

EFFINGHAM, l. 4, *r.* 876. Do. l. 5, *r.* 1004; *dele* including 762 slaves.

EGERIA, or EGERA, the most strongly fortified city of Mingrelia, on the left bank of the Enguri; populous and well built, and giving name to the whole country about it.

EGGS of *Fishes*, l. 6 from the end, for formed *r.* found.

EGG, in *Architecture*, l. 4, for plated *r.* placed.

EGG Harbour. Add—It contains 1830 inhabitants, 22 being slaves.—Also, a town of Burlington county, in New Jersey, containing 931 inhabitants.

EGHAM, l. 4, insert—In 1811, the parish contained 519 houses, and 2823 inhabitants.

EGREMONT, l. 3, *r.* 790.

EGREMENT, l. 6, *r.* 1811; l. 7, *r.* 329, 1556.

EGYPT, col. 6, l. *ult.* for or *r.* an. Col. 7, l. *penult.* for this *r.* the.

EALAIN, in *Chemistry*, a name given by Chevreul to a principle existing in animal tallows or fats. To obtain it, he dissolved the tallow in alcohol, and suffered the *stearin* (see STEARIN) to crystallize; the alcohol was then distilled off, and thus the elain separated. Braconnot procured it in a different manner. He submitted the tallow to pressure between folds of blotting-paper, which absorbed the elain. The paper was then soaked in water, and again subjected to pressure, by which the elain was forced out, and could thus be obtained separately.

Elain thus obtained has much the appearance of a vegetable oil, and is quite liquid at a temperature of 59°. Sometimes it is destitute of smell and colour, but most commonly it possesses both, owing probably to the presence of foreign bodies, from which it is impossible to free it. Chevreul examined the elain from the tallow of the human subject, the sheep, the ox, the hog, the jaguar, and the goose, all of which differed slightly from one another. Their specific gravity varied from .913 to .929; those of the human subject and ox being lightest, and that of the goose the heaviest. Those of the sheep, ox, and hog, were nearly colourless, and destitute of smell; all the others were more or less of a yellow colour, and possessed more or less odour. The elain of the sheep was most soluble in alcohol, 100 parts of which fluid, specific gravity .7952, dissolved 81.17 of elain at a temperature of 167°. The elain of the jaguar was least soluble, only 80.89 parts of the elain being soluble in the same quantity of alcohol at the same temperature. See further on this subject under STEARIN.

ELAOLITE. See MINERALOGY, *Addenda*.

ELBERT, l. 6, *r.* 4291 and 45.

ELBERTON, l. 3, add—it contains 58 inhabitants.

ELBURZ, a range of mountains in Khorassan in Persia, which detaches several branches that expand over the country between Asterabad and Meshed, also over a great way to the east and north of that city, form a junction with the ridge of Banian, and finally sink into the desert plains of Khorazan.

ELECTRICAL WELL, *dele*.

ELECTRICITY, *Medical*. (See MEDICAL Electricity.) This subject was terminated rather abruptly in the article above referred to, we shall therefore endeavour to supply what was there omitted, or has since been observed upon the subject.

The powers of electricity in removing diseases were much over-rated by the earlier electricians, as for the most part

ELECTRICITY.

part happens with all new remedies. The disappointment to which this necessarily led soon brought it into disrepute, and latterly it has been treated with unmerited neglect. There can be no doubt, however, that when judiciously applied, it is a remedy possessing very considerable powers.

It is not our intention to detail here all the diseases to which electricity and galvanism are applicable, as the remedy, when proper, will be found, for the most part, to be recommended in the different articles treating professedly of such diseases. Our object is merely to describe the best and most approved methods of applying electricity, and to state a few remarkable facts which have been lately observed respecting its use.

Electricity may be applied in the form of *shocks, sparks, or of a continued stream or current*. The first of these forms was generally had recourse to by the older electricians, but it has been long since laid aside, except in particular cases of great general, or local debility. In such cases, the *shock* must be proportioned to the degree of the disease, but the size of the jar employed seldom or never ought to exceed a quart. The second form, or that of *sparks* from the chief conductor, is an excellent mode of applying electricity in many instances. It is, however, much less used than formerly. Sparks may be applied by the medium of balls of brass or other metal, and their strength is determined by the magnitude of the prime conductor, of the balls, and of the machine in general, and by the distance at which the balls are removed from the patient's body. The nearer the balls, the less powerful and more frequent are the sparks, and *vice versa*. The third method of applying electricity is in the form of a *continued stream or current*, and this perhaps is the most generally useful and important form of the whole. This method requires a very powerful apparatus. The current is directed through the different parts of the body by means of a simple apparatus placed in contact, or nearly so, with the body, and connected with the prime conductor. Besides these three forms of administering electricity, there is a fourth, which may be considered as intermediate in its nature between the two last; this is the application of what is termed the *electric aura*. It is effected nearly like the last, only the electric fluid is permitted to pass off from *points* of metal or wood placed at some distance from the body, or sometimes instead of *points*, the *edges* of hollow metallic or wooden cylinders, more or less sharp, are employed in a similar manner.

Of these different methods of applying electricity, the two last are undoubtedly in all ordinary cases preferable to the others. They are equally, if not more, beneficial in most instances, if properly applied; and besides have the great advantage of exciting no dread or alarm in the patient, a circumstance which often operates powerfully in deterring timid individuals from having recourse to this remedy, besides being productive of actual injury. These methods, however, as we before observed, require a powerful apparatus, so that the electrician may be enabled to send a very copious stream of the fluid through the whole or any part of the body, if required, as it is chiefly upon this circumstance that the good effects of these modes of applying electricity depend. We would not, however, be understood to recommend these modes of applying electricity exclusively of all others. The application of shocks, and particularly sparks, is often of great use when judiciously employed. Even the alarm they excite may not be without its use in particular cases; but such cases are rare, and the application of the remedy with advantage in these forms requires great judgment and practical knowledge on the part of the medical electrician.

For the phenomena of that modification of electricity termed *galvanism*, and its general effects upon the animal economy, we refer our readers to *VOLTAISM*, where they will find these subjects discussed; we shall therefore chiefly confine our attention here to the exhibition of galvanism as a remedy. The general principles of the application of galvanism differ in no respect from those of the application of electricity, nor do the effects of this form of electricity upon the animal economy differ perhaps in any respect whatever from those produced by common electricity; from the mode, however, in which this variety of the electric energy is excited and brought into action, a little difference in the mode of applying it is necessary. The application of galvanism in the form of shocks and sparks is out of the question. It is always applied in the form of a *continued or interrupted stream*, or sometimes in the form of *aura*; hence the conductors generally require to be in contact with the skin of the patient, which should be kept moist. The greater the surface of the conductor in contact with the skin within certain limits, *ceteris paribus*, the greater the effect produced, and *vice versa*. The *interrupted stream*, or that produced by the frequent removal and re-application of the conductor in contact with the skin, or by otherwise breaking the chain of communication, approaches in its nature more to that of the *electric shock* than the *continued stream*, a circumstance which should be kept in mind by the operator. Indeed with an apparatus composed of small plates, the stream requires to be occasionally interrupted, otherwise the effects will be very much diminished. See *VOLTAISM*, last section.

With respect to the magnitude of the battery proper for medical purposes, no very general rule can be given. The greater the number of plates, especially when of small size, the more do the effects produced upon the animal economy resemble those produced by common electricity. Large plates are best adapted for keeping up the *continued stream*, which is doubtless one of the best modes of exhibiting galvanism, and of ensuring its specific operation, if it exerts any. A medical galvanist can seldom require a battery composed of more than fifty or sixty pairs of plates, from four to six inches square, and a greater or less proportion of these must be employed according to the energy of action in the battery, and the circumstances of his patient. Dr. Wilson Philip states, that few patients can bear, for any length of time, more than from eight to sixteen pairs of plates fourteen inches square, when administered as described below. The same author, however, remarks, that patients can often bear double this number, for a short time, before any disagreeable sensation is produced.

Dr. Wilson Philip has lately attempted to shew that the galvanic battery may be substituted for the nervous energy in animals. His experiments on this subject are extremely interesting, and their results led him to employ galvanism as a remedy in several diseases to which it was never previously applied. These therefore remain to be briefly noticed.

Asthma and Dyspnea.—Dr. Philip states, that he has employed galvanism in many cases of habitual asthma, and almost uniformly with relief. The good effects began to appear usually from five to fifteen minutes after the application of the remedy. His battery consisted of thirty plates fourteen inches square, more or less of which were employed according to the degree of sensation produced; and his rule was to begin with a low power, and gradually increase it by moving one of the wires from one division of the trough to another. His method of exhibiting it in this disease was to apply two thin plates of metal, about two or three inches in diameter, moistened with water, one to the nape of the neck, and the other to the pit of the stomach,

mach, or a little lower, which plates were connected with the wires leading to the opposite ends of the battery. He directs that the wires should be constantly moved upon the metallic plates, particularly the negative wire, otherwise the cuticle is apt to be injured where they rest. The relief seemed much the same whether the positive wire was applied to the nape of the neck, or the pit of the stomach. The different effects, therefore, ascribed by some to positive and negative electricity seem doubtful. When relief was obtained, nothing appeared to be gained by continuing the operation longer. The galvanism was seldom used more than once a day, except in some severe cases. About a sixth part of those on whom it was tried received a permanent cure. It gave decided relief in all cases, and only failed to give considerable relief in about one-tenth of the whole number of cases.

Similar good effects are stated by Dr. Philip to have been experienced in dyspnea, provided no inflammatory symptoms were present. Dr. Philip, however, seems to doubt if it will be found useful in spasmodic asthma.

In *Dyspepsia*, likewise, Dr. Philip thinks it will prove an excellent remedy; also in torpor of the liver and biliary ducts; and a recent writer states, that he has found it very advantageous in chronic *hepatitis*, *constipation*, &c. See an Experimental Enquiry into the Laws of the Vital Functions, by Dr. A. P. Wilson Philip.

ELECTROPHORUS, col. 2, l. 19 from bottom, for hair-skin *r.* hare-skin.

ELEGANCE, col. 2, l. 4 from bottom, for *are r.* have.

ELEGY, l. 2 from bottom, *r.* Gray's.

ELEMENTS, in *Physics*, col. 2, l. 27, for mercury *r.* earth.

ELEOCHARIS, in *Botany*, *ἑλεος*, a marsh, and *χαρις*, an ornament or favour, from its general place of growth.—Brown Prodr. Nov. Holl. v. 1. 224.—A genus separated from *Scirpus* by Mr. Brown; near akin to *Dichromena*, in character, but very different in habit; see those articles. Though the definition is not without exceptions, the genus is thought a natural one by its learned author, embracing *Scirpus palustris*, *geniculatus*, *mutatus*, and *acicularis* of Linnaeus with several others. There are eight New Holland species.

ELEPHAS, col. 10, l. 21 from bottom, for thirteen *r.* three.

ELETTARIA, in *Botany*, so called by Dr. Maton, V.P.L.S., from the Malabar name *Elettari*, or *Ela-vari*, which has always been appropriated to this very plant. If any names of barbarous origin may be retained, and many are now established, even by Linnaeus himself, who in the vigour of his judgment and authority protested against them, the above may well be admitted, for the following reasons. It exclusively belongs to a very important plant, constituting, as far as we know, a genus by itself, and it is perfectly unexceptionable in found and construction, as well as free from all ambiguity. Were this name nevertheless to be finally rejected, we should gladly substitute in its stead that of *Matonia*, in honour of our learned and valued friend, who has first clearly established the genus.—Maton Tr. of Linn. Soc. v. 10. 254. Rheede Hort. Mal. v. 11. 9.—Class and Order, *Monandria Monogynia*. Nat. Ord. *Scitamineae*, Linn. *Canna* Juss.

Gen. Ch. *Cal.* Perianth superior; of one leaf, tubular, cylindrical, elongated, minutely and irregularly toothed at the margin, permanent. *Cor.* of one petal; tube longer than the calyx, cylindrical, slender, curved; outer limb in three equal, oblong, recurved segments, not half the length of the tube; inner a somewhat obovate, large, notched, crenate, undivided lip, with a short claw. *Stam.* Filament

one, rather longer than the claw, stout, erect, with a lanceolate, acute, horizontal lobe, about its own length, on each side at the base, the summit simply notched, without any crest or extension beyond the anther, which consists of two oblong, distant, marginal lobes, about half the length of the filament, attached by their backs, their extremities on a level with the top of the filament. *Pist.* Germen inferior, nearly globular; style thread-shaped, lying close to the filament, between the lobes of the anther; stigma funnel-shaped, small, erect, nearly on a level with the top of the filament. *Peric.* Capsule fleshy, elliptic-oblong, or somewhat ovate, triangular, striated, of three cells, and three coriaceous valves. *Seeds* numerous, roundish, somewhat angular, rough, each with a fine, membranous, evanescent tunic. *Recept.* central, shorter than the capsule when dry, winged with three longitudinal membranes, originally connected with the central ridge of each valve.

Ess. Ch. Anther of two distinct lobes. Filament with two transverse lobes at the base; emarginate and simple at the summit. Outer limb of the corolla in three oblong lobes; inner a single lip. Capsule of three cells and three valves, with a central receptacle. Seeds rough, tunicated.

1. *E. Cardamomum*. Laffer, or Malabar, Cardamom. Maton as above. (*Amomum repens*; Sonnerat Ind. Or. v. 2. 240. t. 136. Rofc. Tr. of Linn. Soc. v. 8. 353. Willd. Sp. Pl. v. 1. 9. A. Cardamomum; White Tr. of L. Soc. v. 10. 230. t. 4, 5. *Alpinia repens*; Sm. Tr. of L. Soc. v. 8. 353, note. Specim. Pharm. Lond. unpubl. 8. A. Cardamomum; Roxb. Monandr. 38. Corom. v. 3. 19. t. 226. Cardamomum minus; Matth. Valgr. v. 1. 25. Camer. Epit. 11. f. 3. Bont. Hist. Nat. 126, the three rounder fruits only. Cluf. Exot. 187. Ger. Em. 1542. Dale Pharmac. 276. C. simpliciter in officinis dictum; Bauh. Pin. 414. C. cum filiquis five thecis brevis; Bauh. Hist. v. 2. 205. Eleitari; Rheede Hort. Mal. v. 11. 9. t. 4, 5.)—Capsule ovate-oblong, obtusely triangular. Calyx notched.—Native of the mountainous parts of Malabar, on lofty cloudy hills, flowering when the rainy season begins, in April and May, ripening seed in October and November. *White, Roxburgh.* Root perennial, tuberous, with many fibres. *Leafy stems* from six to twelve feet high, erect, straight, pale green, not red or brownish, at the base. *Leaves* elliptic-lanceolate, pointed, from nine inches to two and a half feet long, and from one to five inches broad, spreading, dark green, smooth, entire; paler and more glossy beneath. *Stipula* emarginate, rounded, smooth. *Panicles* lateral, several from the tuberous base of each stem near the root, a span long, much branched, many-flowered, spreading horizontally on the ground, jointed, smooth. *Bracteae* alternate, ovate-oblong, acute, at the base of each partial stalk, withering; *partial* ones solitary, tubular, closely embracing the germen and calyx, almost as long as the latter, and resembling it in shape, but deciduous. Outer limb of the *corolla* green; *lip* white, veined with crimson. *Capsule* when fresh fleshy, smooth, nearly globular, but becoming bluntly triangular, coriaceous, and pale brown, when dry. *Seeds* blackish, gratefully aromatic and pungent, with a flavour of Camphor, esteemed more agreeable and useful in food and medicine, than any others of this tribe. (See *CARDAMOM*, excluding what regards *Cardamomum majus*, &c.) This subject will be found explained under our supplementary article *AMOMUM*. Mr. White, who has given a most accurate and perfect history of this plant and its cultivation, under the name of *Amomum Cardamomum*, in Tr. of Linn. Soc. v. 10, above quoted, speaks of its seeds as "one of the most valuable articles of modern luxury, regarded as a necessary of life, by most of the inhabitants of

Asia—a grateful and falubrious accessory of diet—whose general adoption by the civilized nations of the other quarters of the world is prevented only by its limited importation.” This is certainly quite a new idea to us Europeans, who value this drug merely as a grateful and wholesome stomachic, on which account it becomes an article of commerce, having supplanted all its relatives in the apothecary’s shop. Its general use in Asia, indeed, renders the plant a very important and profitable object of culture, though the harvest, occurring at the most unhealthy season, is not unattended by serious dangers. Fevers, fluxes, the bite of innumerable minute leeches, and the instantly fatal sting of the whip-snake, are mentioned as not uncommon mischiefs, to which is added the caustic quality of a shrubby plant, whose botanical characters have not been ascertained, but whose leaves produce dangerous, and sometimes fatal, ulcerations of the skin. The profit of the Cardamom farms, however, is so considerable, as to overcome all difficulties in their cultivation, and Mr. White thinks they might easily be greatly extended.

2. *E. major*. Greater Oblong Cardamom. (*Cardamomum majus*; Dale Pharmac. 276. Bont. Hist. Nat. 127, the fruit only? *C. majus officinarum*; Bauh. Pin. 413. *C. majus vulgare*; Ger. Em. 1542. Clus. Exot. 187. Lob. Ic. v. 2. 204. *C. medium*; Matth. Valgr. v. 1. 25. Camer. Epit. 11. f. 2. Barrel. Ic. obs. 1395. t. 971, the longest fruit. *C. cum siliquis five thecis longis*; Bauh. Hist. v. 2. 205. Enfal; Herm. Mus. Zeyl. 66. Zingiber Enfal; Gartn. t. 12. f. 5.)—Capsule lanceolate-oblong, acutely triangular, with flat sides. Calyx three-lobed.—Native of Java, according to Dale, who remarks that this kind of Cardamom was, even in his time, rarely used, some substituting for it Grains of Paradise, others the *Anomum verum*. (See ANOMUM.) Specimens of this species are indeed, at present, only to be found in the cabinets of collectors. We are persuaded they must belong to the same genus as the Malabar Cardamom. They appear to have a similar panicked inflorescence, and the structure of the fruit, with its central receptacle, coriaceous striated valves, and angular rough or rugged seeds, are the same in this as in the last. These seeds, however, are of a brighter, or reddish hue, and very inferior in flavour, far less powerful and less agreeable. The shape of the capsule is essentially different, being usually thrice as long, and much more acutely and strikingly triangular, flattened at the sides, and more evidently curved. It is similarly crowned with a long, cylindrical, permanent calyx, decidedly three-lobed, whereas that of the former is only crenate, or jagged. This part is unfortunately often rubbed off by those who collect the fruits for sale. If Bontius be right, there is so wide a difference between these two plants in the situation of their flowers, as would almost overturn their generic identity. He gives, under the title of *Cardamomum majus*, a figure with large, terminal, simply racemose inflorescence, which he compares to that of a Hyacinth, describing the plant as taller than a man, with very large leaves, flowers white with a purple limb, and the whole very beautiful. Two capsules, not unlike our plant, though by no means very like it, being represented cylindrical, not triangular, and described as long as the finger, accompany the above figure. We cannot, on mature consideration, think the synonym of Bontius rightly applied. Nevertheless, he speaks of the qualities as agreeing with his *C. minus*, supposed to be our *Anomum Cardamomum*, or *Anomum verum* of old writers, not the preceding *Eleteria Cardamomum*. Clusius, Gerarde, &c. rather copy the fruit from Bontius than from nature, and seem to take the calyx for the stalk.

ELEVATION, *Angle of*, for ARB *r. RAB* (*Plate I. Mechanics, fig. 3.*)

ELGIN, *l. ult.* By the return of 1811, the number of houses in the burgh and parish was 962, and of inhabitants 4602.

ELHAM, *l. 3* from bottom, insert after London—and the parish contains 174 houses, and 992 inhabitants.

ELIZABETH, a township of Miami county, in Ohio, having 730 inhabitants.

ELIZABETH, *Cape*, *l. 7, r. 1415*; *l. 14, r. 1874*; and *l. 15, r. 1734*.

ELIZABETH-Town, *col. 2, l. 1*, after New York, insert—and contained, in 1810, 2977 inhabitants, of whom 222 were slaves; *l. 6, r. 2368*. Add—Also, a town of Kentucky, in Harden county, containing 181 inhabitants, of whom 47 are slaves.

ELK LICK, a township of Somerset county, in Pennsylvania, having 1118 inhabitants.

ELKLAND, a township of Lycoming county, in Pennsylvania, having 91 inhabitants.

ELK RUN, a township of Columbiana county, in Ohio, containing 787 inhabitants.

ELLESMERE, *col. 2, l. 7 and 8, r. 1064 and 5630*.

ELLINGTON, *l. 2, r. 1344* inhabitants.

ELLIOT, a town of York county, in the district of Maine, containing 1650 inhabitants.

ELLSWORTH. Add—and containing 614 inhabitants.—Also, a town of Grafton county, in New Hampshire, having 142 inhabitants.—Also, a township of Trumbull county, in Ohio, having 202 inhabitants.

ELMHAM, NORTH. Add—By the return of 1811, the parish contains 127 houses, and 896 persons.

ELMINA, *l. 8* from bottom, for kaffo *r. braffo*.

ELMORE, *l. 2, r. 157*.

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ELOCUTION. Add to the references—ACTION, ARTICULATION, PASSION, PRONUNCIATION.

ELSENBOROUGH, a town in Salem county, in New Jersey, having 517 inhabitants.

ELTHAM, *l. 3, r. 285* houses, and 1813 inhabitants.

ELWUND, *Mount*, a range of mountains in Irak, in Persia, most probably the mount Orontes of Diodorus, about twelve miles in length. Near its summit, which is tipped with continual snow, and seldom obscured by clouds, is a beautiful valley, perfumed by a thousand sweet-scented flowers. This mountain is famous in the East for its mines, waters, and vegetable productions. The natives of Hamadan, which is situated at the foot of this mountain, believe that some of its grasses have the power of transmuting the basest metals into gold, as well as of curing any distemper to which the human frame is exposed; and the Indians suppose that it contains the philosopher’s stone.

ELY, *col. 2, l. 4*, after includes, insert—5977 houses, occupied by 32,443 inhabitants, &c. *Col. 4, l. 43, r. 4249*; *l. 44, r. 928*.

ELY, or *Elie*. In 1811 this parish contained 157 houses, and 886 persons; *viz.* 365 males, and 521 females.

EMBANKMENT, *col. 25, l. 4* from bottom, insert—In 1809 about 6000 acres of land were obtained by an embankment of the sea upon Cartmel sands, in Lancashire. The embankment at Tre-Madoc, in Carnarvonshire, was completed in 1811.

EMDEN, in *Geography*, a township in the district of Maine, and county of Somerset, having 351 inhabitants.

EMERY,

EMERY, l. 11, after Tennant, insert—(Phil. Transf. for 1802, p. 401.)

EMETIN, in *Chemistry*, a name given by MM. Majendic and Pelletier to a substance extracted by them from ipecacuanha, and so called because it constitutes the principle to which that root owes its emetic qualities. Emetin may be obtained by digesting ipecacuanha in sulphuric ether, and afterwards in alcohol. The alcoholic solution is then to be evaporated to dryness, redissolved in water, and acetate of lead dropped into the solution. The copious precipitate thus obtained being well washed and diffused through water is then to be exposed to the action of fulphuretted hydrogen. The lead is thus precipitated while the emetin remains dissolved in water; and the liquid being filtered and evaporated to dryness, the emetin will be obtained in a state of purity.

Emetin thus obtained exists in the form of brownish transparent scales. Its taste is bitter and a little acrid, but not disagreeable. It has no smell. At the temperature of boiling water it is not changed. When exposed to a higher heat it does not melt, but swells, becomes black, and is converted into water, carbonic acid gas, a little oil, and acetic acid, but yields no trace of ammonia, which indicates that it does not contain azote. A very spongy and light coal remains. When exposed to the air, emetin undergoes no change, except the air be very damp, when it deliquesces. It dissolves readily in water and alcohol, but not in sulphuric ether. It does not crystallize.

Sulphuric and nitric acids, when concentrated, decompose it. Muriatic and phosphoric acids dissolve it without alteration, and it may be separated from them by saturation with an alkali. Acetic acid is one of the best solvents of it. Gallic acid and infusion of galls precipitate it immediately, as do solutions of most of the metallic salts.

Half a grain of this substance occasions violent vomiting, followed by sleep, and the animal awakes in a state of health. A larger quantity, as twelve grains, or even six grains, produces violent vomiting and sleep, followed by death, which appears to take place in consequence of the severe inflammation of the lungs and intestinal canal, produced by large doses of this solution.

ENAMEL of the Teeth, *Chemical Properties of. See TEETH.*

ENCHYLÆNA, in *Botany*, from *χυλος* and *λανος*, alluding, we presume, to its succulent habit, and stony place of growth.—Brown Prodr. Nov. Holl. v. 1. 407.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Holeraceæ*, Linn. *Chenopodeæ*, Br.

Eff. Ch. Calyx five-cleft; pulpy and closed in the fruit. Stamens inserted into its base. Stigmas two or three, thread-shaped. Capsule membranous, covered. Seed three-furrowed.

Procumbent shrubs, very much branched, with alternate fleshy leaves, and axillary, solitary, sessile flowers, without bractæ. There are two New Holland species.

ENDIAN. Add—It lies in N. lat. 30° 18', 20 miles from Zeitoon, occupies both banks of the Tab, and is nearly two miles in circuit. It trades with Bassora and Behaban, and its population is between 4000 and 5000 souls.

ENDIANDRA, in *Botany*, Br. Prodr. Nov. Holl. v. 1. 402, a triandrous genus, perhaps hardly distinct from *Cinnamomum*, which Mr. Brown separates from *Laurus* of Linnæus; and also very near his *CRYPTOCARYA*, see that article.

ENFIELD, l. 4, after parliament, insert—in 1811, 1115 houses, and 6636 inhabitants. The town has only 524 houses, and 5055 inhabitants, and is one of the four quarters into which the parish is divided.

ENFIELD, in *America*, l. 7, r. 1846; l. 10, r. 1291.

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ENFILADE, col. 5, l. 34, fig. 4. Col. 6, l. 20, insert—(fig. 5.)

ENGINE, col. 9, l. 6, for levelled *r.* bevelled.

ENGLAND, New. Add—See AMERICA and UNITED STATES.

ENGURI, a river of Mingrelia, which rises in the mountains of the Abgazians, and flows close to the fortresses of Rugh, between Illani and Anaklie, into the Euxine. Near its source it divides into two branches; and as they never again unite, the right branch retains the name of Enguri; but the left is called Scharifkali, under which denomination it crosses the whole of Mingrelia from N. to S. and falls into the Phasis, seven versts above the city of Potti.

ENOSBURGH, a town of Franklin county, in Vermont, containing 704 inhabitants.

ENUNCIATIVE ORGANS, *dele* the reference.

EPHRATA, or DUNKARD-Town, insert—(which see).

EPIBLEMA, in *Botany*, Brown Prodr. Nov. Holl. v. 1. 315.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Eff. Ch. Calyx and petals equal, spreading. Lip stalked, undivided, with two fasciculated thread-shaped processes at the base; and an appendage attached to the bottom of the column, below the claw of the lip. Anther parallel to the stigma, with a petal-like lobe at each side.

1. *E. grandiflorum*.—Gathered by Mr. Brown, on the south coast of New Holland. Flowers handsome, blue, resembling those of a *THELYMITRÆ*; see that article.

EPIDERMIS. Add—See INTEGUMENTS.

EPIDOTE. See MINERALOGY, *Addenda*.

EPIGLOTTIS. See DEGLUTITION and LARYNX.

EPITHYME, for EPITHEOS *r.* CUSCUTA.

EPPING, l. *penult.* r. 334 and 1874.

EPHING, in *America*, l. 3, r. 1182.

EPSOM, l. 4, r. 1811—397 houses, 2515 inhabitants.

EPSOM, in *America*, l. 4, r. 1810, and 1156.

EPWORTH, l. 1, for Lindley *r.* Manley, western; l. 4, r. 274; l. 5, r. 1502.

EQUAL ALTITUDE, *Infl. by the Earl of Ilay*, col. 1, l. 10 from bottom, for five pairs *r.* two pairs.

EQUATION-MECHANISM, col. 2, l. 33, for received *r.* viewed.

EQUATION, *Contrivances by the Rev. William Pearson*, col. 1, l. 15 from bottom, for was represented *r.* is represented. Col. 10, l. 24, for with *r.* within. Col. 11, l. 22, for arcs *r.* areas.

EQUATORIAL, *Explication and Use of the Tables*, col. 1, l. 19 from bottom, for (like Table I.) *r.* (like Table V.)

EQUATORIAL-MICROMETER, col. 2, l. 12, for fig. 3. r. fig. 4. EQUES, in *Ichthyology*, *Knight-fish*. See *CHÆTODON lanceolatus*. This is a native of the American seas; in length about twelve inches.

ERATOSTHENES, col. 2, l. 9 from bottom, *r.* Bib.

ERBILLE, in *Geography*, a town of Peria, which is probably that Arbela so famous for the final victory obtained by Alexander over Darius, and the capital of the province of Adiabene, is now reduced to a wretched mud town, with a population not exceeding 3000 souls. N. lat. 36° 11'.

EREMOPHILA, in *Botany*, from *ερημος*, a desert, alluding to its place of growth.—Br. Prodr. Nov. Holl. v. 1. 518.—Class and order, *Didymia Angiospermia*. Nat. Ord. *Myoporinæ*, Br.

Eff. Ch. Calyx in five deep segments; changed and membranous in the fruit. Cor..... Stigma undivided. Drupa dry, with four cells, and four seeds.

Two rush-like shrubs, *E. oppositifolia* and *alternifolia*, found on the inhospitable fourth coast of New Holland. Their leaves are semicylindrical. Flowers solitary, stalked.

ERLACHNE, from *ερω*, wool, and *αχνη*, a huft.—Br. Prodr. N. Holl. v. 1. 183.—Clafs and order, *Triandria Digynia*. Nat. Ord. *Gramina*.

Efl. Ch. Calyx of two equal valves, two-flowered. Florets feffile, of two bearded valves. Nectary of two feales. Stigmas feathery.

A genus of tropical graffes, akin to *Aria*, generally downy; their leaves narrow, flowers panicle. Mr. Brown describes ten New Holland fpecies, none of them in any other author. In fix of them, the outer valve of the corolla has a terminal awn.

ERIE, l. 2, r. 3758; after Erie, add—borough, containing 394 inhabitants, of whom, in 1810, 14 were flaves.

ERIOCHILUS, in *Botany*, from *ερω*, wool, and *χιλος*, a lip, becaufe the difk of the nectary is downy.—Br. Prodr. Nov. Holl. v. 1. 323.—Clafs and order, *Gynandria Monandria*. Nat. Ord. *Orchidee*.

Efl. Ch. Calyx ringent; lower leaves ftalked, under the lip. Petals fmaller, erect. Lip ftalked; difk downy, without glands. Column femicylindrical; fimple at the top. Anther terminal, permanent, pointlefs; cells clofe together. Maffes of pollen four in each.

1. *E. autumnalis*. Br. n. 1. (*Epipactis cucullata*; Labill. Nov. Holl. v. 2. 61. t. 211. f. 2.)—Native of the eaft and fourth parts of New Holland. *Bull* globular. *Leaf* radical, enclosed in a fheath, with the bafe of the ftalk, which is four or five inches high, naked, bearing from one to three white or purplifh flowers. Akin to CALADENIA.

ERIVAN. Add—By various fieges, the laft of which was in the year 1808 by the Ruflians, this town is reduced to a ruinous condition. It has been repeatedly taken both by the Turks and Perfians, and has remained in the poffeffion of the latter from the peace of Nadir Shah in 1748. This city, which gives name to a province bounded on the N. and W. by the Moflian hills, on the S. by the Araxes, and on the E. by the diftrict of Karabaug and Karadaug, is fituated on the banks of the river Zengui, and defended by a fortrefs, of an elliptical form, upwards of 6000 yards in circumference. The N.W. fide of the town is built on a precipice, impending over the river 100 toifes in height; but is furrounded by the fort which is encompassed by two ftrong walls, flanked with towers.

ERKOOOM, in *Ornithology*, a bird of Abyffinia, which belongs to a large tribe, differing principally in the beak and horn. The horn is fometimes feen upon the back, and fometimes upon the forehead, above the root of the beak. In the eaft part of Abyffinia, it is called *Abba Gumba*, in the language of Tigré; but on the western fide of the Tacazzé, it is called *Erkoom*. Its groaning noife gives occafion to the firft of its names. By naturalifts, this bird is called the Indian crow or raven. The colour of the eye is a dark brown, or rather of a reddifh caft; the eye-laffes are large: its length from the tip of the beak to the extremity of the tail is three feet ten inches; the length of the beak is ten inches, and the length of the horn three and a half inches. The colour of this bird is footy-black; the large feathers of the wing are ten in number, milk-white both without and within; the tip of his wings reaches nearly to his tail; and at his neck he has thofe protuberances like the turkey-cock, which are light blue, but turn red upon his being chafed, or when the hen is laying. He feems to prefer running on the ground to flying; but when he is raifed, he flies to a confiderable diftance. Its fmell is rank, and he is faid to live in Abyffinia upon dead carcafes; but this Mr. Bruce conceives to be a miftake, as he never follows the army like birds of prey. His food feemed to be the green beetles that are found upon the tops of the teff, and in order to obtain them, he frequents fields of this grain.

He builds in large thick trees, and if he can, always near churches, and his neft is covered like that of a magpie. Mr. Bruce, in the Appendix to his Travels, has defcribed this bird, and accompanied his defcription with a drawing.

ERROL, l. 2, for Grafton r. Coos. Add—and in 1810, contained 38 inhabitants.

ERUCARIA, in *Botany*, Gærtn. v. 2. 298. t. 143. Brown in Ait. Hort. Kew. v. 4. 122. See CORDYLO-CARPUS.

ERVING'S GORE, in *Geography*, a town of Hampshire county, in Maffachusetts, having 160 inhabitants.

ERYTHRÆA, in *Botany*, *ερυθρα*, red. Rencalm. Spec. 77. t. 76. Brown Prodr. Nov. Holl. v. 1. 451. See CHIRONIA *Centaurium, maritima, fpicata*, &c.

ERZERUM, l. 11, after church, add—Mr. M^r Kinneir estimates the whole number of inhabitants at 100,000; 15,000 of whom are Armenians, and the reft Turks, with the exception of 200 or 300 Greeks. Here are nearly 40 mofques, four of which are handfome, a Greek church, a large Armenian chapel, and at a diftance from the city three celebrated monafteries. The bazaars are extenfive. In winter the cold is intense; but the air being pure, and the water good, the natives are flout and healthy. N. lat. 39° 57'. E. long. 40° 57'. The pachalic of Erzerum is the moft confiderable in Armenia; it is divided into twelve diftricts, and governed by a pacha of three tails, who refides at Erzerum.

ESCAPEMENT, *Ifochronal for a Pendulum*, col. 2, l. 7 from the bottom, for CN r. QN. Col. 3, l. 13, for ND. r. NQ.—*Escapement by Alex. Cumming*, col. 1, l. 10 from the bottom, for D r. H.

ESKIMAUX BAY, r. Labrador.

ESOX, col. 5, l. 25; after represented, inferf—curving.

ESSEX, l. 5 from bottom, r. 42,829 and 252,473.

ESSEX, in America, l. 7, r. 8; l. 8, r. by the census of 1810, 71,888 inhabitants.

ESSEX, in Virginia, l. ult. r. 9376 inhabitants, of whom, in 1810, 5659 were flaves.

ESSEX, in New Jerfey, l. 4, for 3 r. 9; l. 5, r. 25,984 and 1120.

ESSEX, in New York, add—containing 9477 inhabitants.

ESSEX, in Vermont, add—containing 14 townfhips, and 3087 inhabitants.

ESSEX, a townfhip, &c. l. 2, r. 957.

ESTLE, a county of Kentucky, containing 2082 inhabitants, of whom, in 1810, 133 were flaves.

ETHER, in *Chemiftry*. The fpecific gravity of fulphuric ether, as recently determined by M. Theodore de Sauffure, is .7155 at 68°; and it boils in vacuo at — 20°, and not at 20°, as ftated in the Cyclopædia. The fpecific gravity of the vapour of fulphuric ether, according to Mr. Dalton, is 2.25; according to M. Gay Luffac, whose experiments were made with great care, it is 2.586, that of air being 1. M. Theodore de Sauffure has lately published an analysis of fulphuric ether: according to this ingenious chemift, it is compofed of

Hydrogen	14.40
Carbon	67.98
Oxygen	17.62
	<hr/>
	100.00

Which proportions are nearly equivalent to

Olefiant gas	86.05
Water	19.95
	<hr/>
	100.00

ETHER.

Dr. Thomson, however, seems to doubt the perfect accuracy of this analysis, and supposes rather that it is a compound of four atoms of olefiant gas and one atom of water, which supposition nearly agrees with the specific gravity of the vapour of ether above-mentioned, as determined by M. Gay Lussac. Thus the sp. gr. of olefiant gas being .974—

Two volumes of it will weigh	1.948
The sp. gr. of the vapour of } water is - - - - }	.625
	2.573

which certainly differs but little from 2.586, the true sp. gr. according to M. Gay Lussac.

Nitric Ether.—The properties of this singular substance have been lately investigated by Thenard. This eminent chemist found the following to be the best mode of preparing it. Equal parts of alcohol and nitric acid, of the sp. gr. 1.283, were put into a retort, to the neck of which was luted a glass tube, which was plunged to the bottom of a long narrow glass jar, half filled with a saturated aqueous solution of common salt. From the top of this jar passed another tube, which went to the bottom of another similar jar, filled with the same solution. In this manner, five other similar jars were connected with each other, and from the last a tube passed to a water-trough, to receive the gaseous products in proper vessels. Each of these jars was surrounded with a mixture of snow and salt, to keep it as cool as possible. A moderate heat was then applied to the retort, which produced so violent an effervescence, that it became necessary to moderate it by withdrawing the fire, and applying cold water to the outside of the retort. At the end of the operation, the ether was found floating on the surface of the solution in the different jars, but more especially in the first. It was separated, and to remove the nitrous and acetic acids with which it was contaminated, it was agitated in a close phial with a sufficient quantity of chalk. Thus purified, it possesses the following properties.

It has a slightly yellow colour, and a very strong ethereal odour. Its taste is likewise strong and peculiar. It is rather heavier than alcohol. It is much more volatile than sulphuric ether, the heat of the hand being sufficient to make it boil; hence it produces a very considerable degree of cold by its evaporation. It is lighter than water, and requires about forty-eight parts of that fluid to dissolve it. The solution has an agreeable odour, like that of apples. It is soluble in alcohol in every proportion. It is very inflammable. When kept for some time, both nitrous and acetic acids are formed in it. The same acids also are produced if it be heated, or even agitated with water. It has also the property of absorbing these acids very readily, and acquiring the property of reddening vegetable blues. Its vapour is much more elastic than that of sulphuric ether.

According to Thenard, it is composed of

Hydrogen - - - -	8.54
Carbon - - - -	28.45
Oxygen - - - -	48.52
Azote - - - -	14.49
	100.00

But Dr. Thomson does not seem to place much reliance in the accuracy of this analysis.

Muriatic Ether.—Since the article ETHER was written for the Cyclopædia, this species of ether has been examined

with great care by Gehlen, and still more recently by Thenard, which latter chemist has given the following as the best mode of preparing it.

A retort is to be nearly filled with a mixture of equal bulks of muriatic acid and alcohol, both as strong as possible. To prevent the effects of the violent ebullition which would otherwise take place on the application of heat, a few grains of sand are to be introduced into the retort. From the neck of the retort a tube passes into a glass jar, twice the size of the retort, and furnished with three mouths. This jar should be half filled with water of the temperature of about 70°. Into the second mouth a short tube of safety is to be luted; and into the third, a tube which passes into a water-trough to receive the gas. On the application of heat, the ether escapes in the form of gas. This gas is colourless, does not affect vegetable colours nor lime-water. Its sp. gr. is 2.219, that of air being 1. At the temperature of 67°, water dissolves its own bulk of it. At the temperature of 52°, it becomes liquid ether.

Muriatic ether in its liquid state is colourless like water, very liquid, has no action on vegetable blues, and has the same smell and taste as in the gaseous state. At the temperature of 41°, Thenard ascertained its sp. gr. to be .874. It is much more volatile than alcohol, or even sulphuric ether. None of the usual tests indicate the presence of muriatic acid in it. When burnt, however, a considerable proportion of this acid is disengaged, a fact first observed by Gehlen, and since fully confirmed by Thenard. From Thenard's analysis, it appears that this singular compound is composed of

Muriatic acid - - -	29.44
Carbon - - - -	36.61
Oxygen - - - -	23.31
Hydrogen - - - -	10.64
	100.

Dr. Thomson is disposed to consider it as a compound of one volume of olefiant gas, and one volume of muriatic acid gas, condensed into one volume; or, what is the same thing, of four atoms olefiant gas, and one atom of muriatic acid. On this supposition, its constituents will be

Five atoms hydrogen	= 6.25
Four atoms carbon	= 30.00
One atom chlorine	= 45.00
	81.25
And the weight of its } atom will be - - }	= 81.25

Hydriodic Ether.—This ether was discovered by M. Gay Lussac. He formed it by mixing together two volumes of absolute alcohol, and one volume of hydriodic acid of the sp. gr. 1.7, and distilling in a water-bath. Hydriodic ether, after being well washed with water, is perfectly neutral. Its odour is strong, and analogous to that of other ethers. In a few days it acquires a reddish colour, which is instantly removed by mercury or potash. Its sp. gr. at 72° is 1.9206. It boils at the temperature of 148½°. It is not inflammable, but merely gives out purple vapours when put upon burning coals. When passed through a red-hot tube, it is decomposed, an inflammable carburetted gas is obtained, hydriodic acid evolved, and some charcoal deposited. This ether has not been analysed; but Dr. Thomson is disposed to believe, from analogy, that it has a composition similar to that of muriatic ether, or that

it is composed of four atoms olefiant gas, and one atom of hydriodic acid.

Acetic Ether.—The original experiments of Lauraguais and Scheele have been lately repeated by other chemists, and particularly by Thenard. Thenard succeeded in forming this ether, by repeatedly distilling together very concentrated acetic acid and alcohol. No gaseous product was evolved. The superfluous acid was neutralized by potash, and the ether finally obtained by a cautious distillation of the resulting liquid from acetate of potash. Acetic ether thus procured is limpid and colourless. Does not redden vegetable blues. Possesses a peculiar taste, quite different from that of alcohol. Its sp. gr. at $44\frac{2}{3}^{\circ}$ is .866. It boils at the temperature of 160° . It burns with a yellowish-white flame, and acetic acid is evolved during its combustion. At the temperature of 62° , it requires more than seven times its weight of water to dissolve it. It appears from these and other properties to be a compound of acetic acid and alcohol.

Formic Ether.—This was first formed by Gehlen. It may be prepared precisely in the same way as acetic ether, merely substituting the formic for the acetic acid. Formic ether has an agreeable odour, similar to that of peach blossoms. Its taste is likewise similar, leaving an impression of ants. At a temperature of 63° , its sp. gr. is .9157. It burns with a blue flame, having yellow edges, and at the above temperature is soluble in nine times its weight of water. This ether has not been analyzed.

ETON, col. 3, l. 25, r. to be seen; l. 57, r. 314 and 2270.

EVANDRA, in *Botany*, from *ev* and *ανδρ*, alluding to its abundant stamens, in a tribe where three is the usual number.—Br. Prodr. Nov. Holl. v. 1. 239.—Clafs and order, *Dodecandria Monogynia*. Nat. Ord. *Calamaria*, Linn. *Cyperoidea*, Juss.

Eff. Ch. Spikelets generally single-flowered; scales imbricated, mostly empty. Stamens twelve or more. Nut cylindrical, crustaceous, without bristles at the base; kernel smooth. Tall bog-plants, from the south coast of New Holland. Scales blackish externally; upper ones silky internally. Somewhat allied to CHRYSITRIX. There are two species.

1. *E. ariflata*. Stem leafy. Spikelets paniced, awned.

2. *E. pauciflora*. Stem naked. Spikelets solitary or in pairs, without awns.

EUCHILUS, Brown in Ait. Hort. Kew. v. 3, 17, seems to us a PULTENÆA; see that article.

EUCHLORINE, in *Chemistry*. See OXYMURIATIC Acid.

EUCLID, in *Geography*, a township of Cayahuga, in Ohio, containing 283 inhabitants.

EUCLIDIUM, in *Botany*, from *ev*, *well*, and *κλιδος*, *to shut up*, because of the firmly-closed seed-vessel.—Br. in Ait. Hort. Kew. v. 4, 74.—Clafs and order, *Tetradynamia Siliculosa*. Nat. Ord. *Siliculosæ*, Linn. *Crucifera*, Juss.

Eff. Ch. Pouch tumid, of two cells, with evident futures but not bursting. Seeds solitary. Cotyledons flat.

1. *E. ffricicum*. Syrian Euclidium. Ait. n. 1. (Anafatica ffrica; Linn. Sp. Pl. 895. Jacq. Austr. t. 6.)—Pouch rough. Style awl-shaped, permanent. Leaves lanceolate, stalked.—Native of the warmer parts of Europe. What the other species may be we are not informed.

EUDÆSMIA, from *ev*, *well*, and *δυσμος*, *confined*.—Brown Bot. of Terr. Austr. 67.—Clafs and order, *Polyadelphia Polyandria*. Nat. Ord. *Hesperidea*, Linn. *Myrti*, Juss.

Eff. Ch. Calyx four-toothed, superior. Petals closely united into a deciduous lid, with four furrows. Stamens

in four sets, alternate with the calyx-teeth, combined at the base. Capsule of four cells, opening at the top. Seeds numerous.

1. *E. tetragona*. Br. as above, t. 3.—In exposed barren places near the shore, about Lucky bay, on the fourth coast of New Holland, flowering and bearing fruit in January. Br. A *shrub*, three to five feet high, with square, bordered *branches*. Leaves stalked, ovate-oblong, mostly opposite, coriaceous, four or five inches in length, entire, glaucous, dotted with resinous points. *Umbels* axillary, stalked, of three or four *flowers*, whose numerous white *stamens* spread conspicuously after the lid is fallen. We believe this fine plant is living in the green-house of the Comtesse des Vandes, at Baywater.

EUDIOMETER. See LABORATORY.

EUDIOMETRY. Add—See LABORATORY.

EVELYN, l. 2, insert after Surrey—October 31st; l. 4, for Christchurch r. Baliol college; l. 5, insert—spent much of his time. At the close of his article, add—For a farther account of the life and writings of this excellent person, we refer to the "Memoirs," published from original MSS. in 2 vols. by William Bray, eq. Lond. 1818.

EVESHAM, col. 2, l. 10 from the bottom, r. 674 houses, and 3068 inhabitants.

EVESHAM, in America, add—In 1810, it contained 3445 inhabitants.

EUPOMATIA, in *Botany*, from *ev*, *well*, and *πυματις*, *to shut up with a cover*.—Brown Bot. of Terr. Austr. 65.—Clafs and order, *Monadelphia Polyandria*. Nat. Ord. *Coadunata*, Linn. *Annonacea*, De Cand. Br.

Eff. Ch. Calyx a superior, entire, deciduous lid. Corolla none. Inner itamens dilated, imbricated, without anthers. Styles none. Stigmas numerous, depressed. Berry globose, bordered, with many seeds.

1. *E. laurina*. Br. as above, t. 2.—In mountainous woods, and about great rivers, at Port Jackson, flowering in December and January. A slender *shrub*, from five to ten feet high, very smooth. Leaves alternate, on short stalks, obovate-oblong, acute, entire, coriaceous, four or five inches long. *Flower-stalks* axillary, short, bearing two or three small leaves, and one *flower*, whose numerous, pale yellow, perfect *stamens* spread, in a radiant manner, after the lid is gone, displaying the broad imperfect ones, united with them below, overlapping the *stigmas*. These superfluous intruders are observed, by Mr. Brown, to be usually eaten away by insects. Berry three-quarters of an inch broad. Seeds oval, wrinkled.

EURYALE, the name of one of the Gorgons, adopted here to express the thorny menacing habit of the plant. It might likewise be understood as alluding to the ample area of the leaves.—Salib. in Ann. of Bot. v. 2, 73. Ait. Hort. Kew. v. 3, 295.—Clafs and order, *Polyandria Monogynia*. Nat. Ord. *Rhoeadeæ*, Linn. *Hydrocharideæ*, Juss. *Nymphaeæ*, Salib.

Eff. Ch. Calyx of four leaves, superior. Petals numerous. Stigma sessile, peltate. Berry crowned with the calyx. Seeds numerous, unicated.

1. *E. ferox*. Prickly Euryale. Ait. n. 1. Roxb. Corom. v. 3, 39, t. 244. Annelæ spinosa; Andr. Repof. t. 618.—Native of lakes and ponds in India, to the east of Calcutta. Roxb. This has the habit of a *Nymphaea*. The floating peltate leaves, cloven at the base, are from one to four feet wide; purple beneath; their ribs, veins, and stalks, like the *flower-stalks*, calyx, and fruit, armed copiously with sharp prickles. Flowers comparatively small, purple, with yellow stamens. Fruit about two inches in diameter. Seeds, or nuts, the size of a large pea, each in a loose coloured tunic.

tunic. This noble plant has flowered in the duke of Marlborough's aquarium at White Knights. *Annelæa* was the name originally intended by Dr. Roxburgh.

EUSTREPHUS, from *eu*, *well*, and *στρεφω*, *to turn*, or *twine*.—Brown Prodr. Nov. Holl. v. 1. 281. Ait. Hort. Kew. v. 2. 272.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Asphodelæ*, Br.

Efl. Ch. Corolla in fix deep segments; three innermost fringed. Anthers erect. Stigma triangular. Capfule pulpy, of three cells, and three valves, with partitions from their centre. Seeds fveral; fcar crefted.

Twining leafy *frubs*, from the warmer parts of New Holland, with alternate, ribbed, entire *leaves*; fimple, aggregate, drooping *flower-ftalks*; pale purple elegant *flowers*; yellow *fruit*, and rather large black *feeds*.

1. *E. latifolius*. Ovate Fringe-bloffom. Ait. n. 1. Br. n. 1. Curt. Mag. t. 1245.—Leaves more or lefs ovate. Filaments combined at the bafe. Tips of the anthers twifled in fading.—Native of New South Wales. *Dr. White*.

2. *E. angustifolius*. Linear Fringe-bloffom. Br. n. 2.—Leaves linear-lanceolate. Filaments diftinct. Tips of the anthers always ftraight.—Found within the tropic, as is alfo the firft fpecies. *Mr. Brown*.

EUTAXIA, Br. in Ait. Hort. Kew. v. 3. 16, we fcuple to feparate from DILLWONIA: it is our fourth fpecies there defcribed.

EUTHALES, from *eu*, *well*, and *αλεω*, *to flourifh* or *blloffom*.—Br. Prodr. Nov. Holl. v. 1. 579. Ait. Hort. Kew. v. 1. 363.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Goodenovia*, Br.

Efl. Ch. Calyx inferior, tubular, in five unequal fegments. Tube of the corolla adhering to the germen beneath, fplit on one fide above; limb two-lipped. Anthers diftinct. Stigma with a two-lipped cover. Capfule of four valves; two-celled at the bafe. Seeds imbricated, compreffed.

1. *E. trinervis*. Three-ribbed Euthales. Br. n. 1. Ait. n. 1. (Velleia trinervis; Labill. Nov. Holl. v. 1. 54. t. 77. Goodenia tenella; Andr. Repof. t. 466. Curt. Mag. t. 1187.)—From the fourth coat of New Holland. An herbaceous perennial plant, with hairy radical *leaves*, forked radical *flower-ftalks*, and handfome golden *flowers* with a dark-purplefifh, central, divided fpot.

EWELL, l. 7, r. 1811, 225 houfes, and 2135 inhabitants.

EXARRHENA, in *Botany*, from its prominent ftamens, in which it feems chiefly to differ from *Myofotis*.—Br. Prodr. Nov. Holl. v. 1. 495.—The only fpecies is *E. fuaaveolens*, found in Van Diemen's ifland, a hairy herb, with decurrent *leaves*, and fragrant white *flowers*.

EXECUTION, in *Painting*, col. 4, l. 2, r. Janus.

EXETER, col. 4, l. 23 from the bottom.—The number of inhabitants in the city of Exeter and county of the fame, by the return of 1811, was 2879 houfes, and 18,806 inhabitants.

EXETER, in America, l. 17, r. 8759.—In Washington county, l. 3, r. 2236, and add—Alfo, a county of New York, containing 9477 inhabitants.—Alfo, a township of Berks county, in Pennsylvania, having 1194 inhabitants.

EXHALING VESSELS. See *Exhalant System* under HEART.

EXMOUTH, l. 18, r. 459 houfes, 2301 inhabitants; l. 19, r. 371.

EXPANSION, col. 3, l. 31, for expands r. contracts.

EXPANSION of the Gafes. See GAS.

EXPONENTIAL EQUATION, *dele* the reference.

EXPOSURE, col. 2, l. 2, for fouthern r. northern.

EXPRESSION, PHYSIOGNOMICAL. See EMOTION, and GESTURE.

EXPRESSION, in *Painting*, col. 9, l. 37, for woman r. women.

EXTRACT—EXTRACTIVE *Principle*, in *Chemiftry*. Great confufion exifts in different chemical authors refpecting thefe terms. Formerly the term *extract* was applied to all thofe fubftances which were extracted from plants by means of water or fpirits; but of late it has been confined by many to a fubftance which is fuppofed to exift in many plants, and which may be obtained tolerably pure from the bark of the cinchona officialis, according to the experiments of Schrader. Other chemifts, however, ftill ufe the term *extract* in its original fenfe; hence Dr. Thomfon, to prevent ambiguity, has chofen to diftinguifh the principle of Schrader by the term *extractive*. The following are the properties of *extractive*, according to Dr. Thomfon.

1. Soluble in water, and the folution is always coloured.

When the water is flowly evaporated, the extractive matter is obtained in a folid ftate, and tranfparent; but when the evaporation is rapid, the matter is opaque.

2. The tafte of extractive is always ftrong, but it is very different according to the plant from which it is obtained.

3. It is infoluble in abfolute alcohol and in ether, but folvable in alcohol when it contains water.

4. By repeated folutions and evaporations, the extractive matter acquires a deeper colour, and becomes infoluble in water. This change is confidered as the confequence of the abforption of the oxygen of the atmofphere, for which the extractive principle has a great affinity. But if the folution be left to itfelf, expofed to the atmofphere, the extract is totally deftroyed in confequence of a kind of putrefaction which fpeedily commences.

5. When chlorine is poured into a folution containing extractive, a very copious dark yellow precipitate is thrown down, and the liquid retains but a light lemon colour. Thefe flakes are confidered as oxygenized extractive; it is now infoluble in water, but hot alcohol diffolves it.

6. The extractive principle unites with alumina, and forms with it an infoluble compound. Accordingly, if fulphate or muriate of alumina be mixed with a folution of extractive, a flaky infoluble precipitate appears, at leaft when the liquid is boiled; but if an excefs of acid be prefent, the precipitate does not always appear.

7. It is precipitated from water by concentrated fulphuric acid, muriatic acid, and probably by feveral other acids. When the experiment is made with fulphuric acid, the fumes of vinegar generally become fenfible.

8. Alkalies readily unite with extractive, and form compounds infoluble in water.

9. The greater number of metallic oxyds form infoluble compounds with extractive. Hence many of them, when thrown into its folution, are capable of feparating it from water. Hence alfo the metallic falts moftly precipitate extractive. Muriate of tin poffeffes this property in an eminent degree. It throws down a brown powder, perfectly infoluble, compofed of the oxyd of tin and vegetable matter.

10. If wool, cotton, or thread, be impregnated with alum, and then plunged into a folution of extractive, they are dyed of a fawn-brown colour, and the liquid lofes much of its extractive matter. This colour is permanent. The fame effect is produced if muriate of tin be employed inftead of alum. This effect is ftill more complete if the cloth be foaked in chlorine, and then dipped into the infufion of the extractive. Hence we fee that the extractive matter

matter requires no other mordant than oxygen to fix it on cloth.

11. When distilled, extractive yields an acid liquid impregnated with ammonia.

It cannot be doubted, continues Dr. Thomson, that there are many different species of extractive matter, though the difficulty of obtaining each separately has prevented chemists from ascertaining their nature with precision. Watery extracts, when obtained by slow evaporation to dryness, always have an acid taste, and redden litmus. They all yield a precipitate while liquid on the addition of ammonia. This precipitate is a compound of lime and insoluble extractive. Lime always causes them to exhale the odour of ammonia. It has been ascertained, that the extractive principle is more abundant in plants that have grown to maturity than in young plants.

All the extracts prepared by apothecaries are compounds of the extractive principle with several others, even as many as eight or more, according to Dr. Thomson. In short, this department of vegetable chemistry is at present in a very confused and imperfect state.

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EYE, *Physiology of the*, col. 6, l. 26 from bottom, for an inch r . one-tenth of an inch.

EYE, *Humours of, Chemical Properties of*. Some experiments have been made on these fluids, the results of which deserve to be briefly mentioned.

Aqueous Humour.—Mr. Chenevix found the sp. gr. of the aqueous humour of the sheep at 60° to be 1.009. This fluid scarcely affects vegetable blues while fresh. On exposure to heat, a slight coagulum is formed. Tannin occasions a precipitate in it, both before and after boiling. Nitrate of silver likewise produces a precipitate, but no other metallic salt. According to Berzelius, 100 parts of it consist of

Water	-	-	-	98.10
Albumen, a trace	-	-	-	
Muriates and lactates	-	-	-	1.15
Soda with animal matter, soluble	}	-	-	.75
only in water				
				100.

Vitreous Humour.—This possesses very nearly the same properties as the aqueous. Even its sp. gr. is the same, or only a very little heavier. According to Berzelius, it is composed of

Water	-	-	-	98.40
Albumen	-	-	-	.16
Muriates and lactates	-	-	-	1.42
Soda with animal matter, soluble	}	-	-	.02
only in water				
				100.

CrySTALLINE LENS.—The sp. gr. of this is 1.100. When fresh it has little taste. It putrefies very rapidly. It is almost completely soluble in water. The solution is partly coagulable by heat, and gives a copious precipitate with tannin both before and after boiling. According to Berzelius, it is composed of

Water	-	-	-	58.0
Peculiar matter	-	-	-	35.9
Muriates, lactates, and animal	}	-	-	2.4
matter soluble in alcohol				
Animal matter, soluble only in	}	-	-	1.3
water, with some phosphates				
Portions of the remaining in-	}	-	-	2.4
soluble cellular membrane				
				100.

The peculiar matter of the lens possesses all the chemical properties of the colouring matter of the blood, except colour.

The humours of the human eye are composed of the same ingredients as those of the sheep; but they differ in their sp. gr. Thus the sp. gr. of the human aqueous and vitreous humour is 1.0053; that of the crystalline 1.0790. The humours of the eyes of oxen also resemble those of the sheep. The sp. gr. of the aqueous and vitreous humours is 1.0088; that of the crystalline 1.0765. The crystalline of the ox weighed thirty grains. When the whole was pared away, except six grains in the centre, the sp. gr. was found to be 1.194.

Sir H. Davy found the same constituents in the eyes of birds; but the sp. gr. of the vitreous humour in these animals is greater than the sp. gr. of the crystalline.

Pigmentum Nigrum.—This curious substance has been examined by Gmelin. From 500 eyes of oxen and calves he collected 75 grains. Its colour is blackish-brown. It is tasteless, and adheres to the tongue like clay. It is insoluble in water, alcohol, ether, oils, lime-water, and acetic acid. It dissolves in potash and ammonia by the assistance of heat, and is again precipitated by acids. Sulphuric acid dissolves it, and becomes black. Muriatic acid also forms an imperfect solution. Nitric acid dissolves it, and changes its colour to reddish-brown. When distilled it yields water, brown oil, and carbonate of ammonia. The residuum consists almost entirely of charcoal.

EYE, col. 2, l. 6, r . In the year 1811, the town and parish consisted of 326 houses, and 1893 inhabitants.

EYEMOUTH. Add—By the return of 1811, the parish contained 115 houses, and 962 inhabitants.

EYNSHAM, or ENSHAM, *l. ult.*—In 1811, the number of inhabitants was 1,418, and of houses 246.

F.

F A R

FABER, JACOBUS STAPULENSIS. See FEVRE.
FAHRENHEIT, l. 2, Hamburg or Dantzic.

FAIRFAX, l. 3, r. 13,111 inhabitants, of whom 5942 were slaves in 1810. At the close, add—Also, a town of Maine, in Kennebeck, containing 924 inhabitants.

FAIRFIELD, l. 4, r. 17; l. 5, r. 40,950; l. 6, r. 83; l. 17, r. 4,125; l. 23, add—divided into 15 townships, containing 11,361 inhabitants. For Kennebeck r. Somerfet; l. 26, r. 1348; l. 30, r. 1618; l. 36, add—containing 2279 persons; l. 43, r. 1973; l. 47, add—It contains 11,857 inhabitants, of whom 4034 are slaves.—Also, a township in Crawford county, in Pennsylvania, having 421 inhabitants.—Also, a township of Butler county, in Ohio, having 1414 inhabitants.—Also, a township of Columbiana county, in Ohio, having 852 persons.—Also, a township of Highland county, in Ohio, having 1167 inhabitants.

FAIRFIELD, *New*. See *New*, &c.

FAIRFORD. In 1811, the parish contained 295 houses, and 1444 persons; *viz.* 688 males, and 756 females.

FAIRHAVEN, l. 6, r. 645; add—Also, a small township of Maine, in Sumerfet county, having 116 inhabitants.

FAIRLEE. At the close, add—983.

FAIR VIEW, a township of York county, in Pennsylvania, containing 1298 persons.

FALHERZ. See *MINERALOGY*, *Addenda*.

FALLOWFIELD, *East and West*. Two townships in Chester county, in Pennsylvania; the former containing 991, and the latter 1157 persons.—Also, a township of Washington county, in Pennsylvania, having 1934 inhabitants.—Also, a township of Crawford county, in Pennsylvania, having 551 persons.

FALLS, a township of Bucks county, in Pennsylvania, having 1649 persons.—Also, a township of Mulkingum county, in Ohio, having 951 inhabitants.

FALMOUTH. At the close, add—By the return of 1811, the town of Falmouth contains 465 houses, and 3933 inhabitants.

FALMOUTH, in America, l. 3, r. 4105. Col. 2, l. 11, r. 2237.

FANNET, a township of Franklin county, in Pennsylvania, containing 1398 inhabitants.

FAQUIER, l. 3 and 4, r. 22,689 inhabitants, of whom 10,361 are slaves.

FAREHAM. In 1811, the parish contained 596 houses, and 3325 persons; *viz.* 1592 males, and 1733 females.

FARM, col. 5; l. 9 from the bottom, for *Led-farms* r. *Lta-farms*.

FARMER, RICHARD, col. 2, l. 12, for which he exchanged for *r.* for which he exchanged.

FARMINGTON, l. 7, r. 1639. After Boston, add—

F E A

Also, a town of Strafford county, in New Hampshire, having 1272 inhabitants; l. 15, r. 2748.

FARRIERY, denotes the business or practice of a farrier, which, in its more limited sense, pertains to the shoeing of horses, (see *SHOEING*), and the various circumstances attending it; but in its more extensive sense, and as it is often used and understood, it comprehends the whole veterinary art, as it relates to the management of animals in general, including the knowledge and proper treatment of their diseases. See each disease under its appropriate term.

FARRINGTON. In 1811, the parish of Great Farrington contained 327 houses, and 1843 persons; *viz.* 900 males, and 943 females: 175 families being employed in agriculture, and 131 in trade, manufactures, and handicraft.

FARSETIA, in *Botany*, a genus originally founded by Dr. Antonio Turra, of Vicenza, in a quarto dissertation, (published at Venice in 1765,) reduced by Linnaeus to *Cheiranthus*, is restored by Mr. Brown, in *Ait. Hort. Kew.* v. 4. 96. It commemorates Philip Farseti, a noble Venetian, celebrated for his botanical erudition. Mr. Brown gives the following

Ess. Ch. Pouch elliptic-oblong, sessile, compressed, with flattish valves. Cotyledons accumbent. Seeds several; either bordered, or some of the filaments are toothed. Six species are defined in *Hort. Kew.*

FARSISTAN, l. 6, after province, add—is divided into the Germafer and Sirhud, or the warm and cold climates. The former is that tract which extends from the sea to the latitude of Kazeroon, and runs parallel with the gulf, from the banks of the Tab to the confines of Laritan. The Sirhud, denoting boundary, and metaphorically applied to a cold region, comprehends most of the mountainous part of Fars, extending from the latitude of Kazeroon to that of the town of Yezdekhaft, situated on the bed of a former river, which separates this province from Irak Fars, &c.

FAVART, l. 23, for *retrouffé* r. *retrouffé*.

FAVERSHAM, col. 3, l. 30, r. in 1811—672—3872.

FAWN, l. 3, r. 1402.

FAYETTE, l. 4, r. 9; l. 6; 24,714 inhabitants, of whom 58, in 1810, were slaves.—Also, a county of Ohio, containing 1854 inhabitants. Col. 2, l. 4, r. 8039; l. 5, r. 2905; l. 9, r. 804; add—Also, a township of Alleghany county, in Pennsylvania, containing 2016 inhabitants.

FAYSTON, a town of Chillendon county, in Vermont, having 149 inhabitants.

FEARING, a town of Ohio, in Washington county, having 454 inhabitants.

FEATHERS, *dry-pulled, scalded, dele* the reference to **BED**.

FELAHI,

FELAHL, or DORAK, one of the principal towns of Chufitan or Kuzifitan, in Persia, founded by Sheikh Soliman when the ancient Dorak, one of the eight cities of Sufiana, was abandoned. It is situated in low marshy ground, on the banks of two of the branches of the Jerahi, surrounded with mud walls, sixteen feet thick and two miles in circumference, flanked at intervals with towers. The inhabitants, amounting to 8000, live chiefly without the walls in the fuburbs. This town is celebrated for the manufacture of the abba, or Arabian cloak, which is transported in great numbers all over Persia and Arabia.

FELSPAR. See FELSPAR and MINERALOGY, *Addenda*.

FELUGIA, or ANBAR, in *Geography*, a town in the pachalic of Bagdad, which, under the appellation of Perifabur, is ranked, in the history of the campaigns of Julian, as the head city in Assyria. The city was reduced to ashes, and on its ruins a palace was erected by Soliman the Great, pacha of Bagdad. Pilgrims going to Kerbela generally cross the river at this spot, on a bridge of boats.

FENCE, col. 2, l. 20, *dele* low. Col. 3, *dele* hedge, last word, and the comma in l. 2. Col. 21, l. 4, for thus above *r.* thus formed above; l. 34, 35, for under the plough *r.* into grafs.

FEREDUN, in *Geography*, a small district of Irak, in Persia, behind the S.W. ridge of the mountains of Khonfar, peopled with Georgians and Armenians, brought hither by Abbas the Great. The former, amounting to 1000 families, are Mahometans, who never intermarry with either Persians or Armenians. The capital of the district is Puashifh.

FERGUSON, a township of Centre county, in Pennsylvania, having 1666 inhabitants.

FERMANAGH, l. 2, *r.* 1954.

FERMENTATION, VINOUS, in *Chemistry*. The recent observations of chemists enable us to state with greater precision the changes which fugar undergoes during its conversion into alcohol, than could be done when this article was written for the Cyclopædia.

Sugar is compofed, according to Dr. Prout's analysis, of

Hydrogen	-	-	6.66
Carbon	-	-	40.00
Oxygen	-	-	53.33
			= 100.

which correspond with 1 atom of each element.

Alcohol, according to Dr. Thomson, is a compound of about

Hydrogen	-	-	13.04
Carbon	-	-	52.16
Oxygen	-	-	34.80
			100.

which correspond with 3 atoms of hydrogen, 2 atoms of carbon, and 1 atom of oxygen; and carbonic acid gas is composed of

Carbon	-	-	27.27
Oxygen	-	-	72.72
			= 100.

or of 1 atom of carbon and 2 atoms of oxygen.

Hence, if we suppose (for the sake of round numbers) 3 atoms of fugar to be decomposed during the process of

fermentation, they will be converted into 1 atom of alcohol and 1 atom of carbonic acid; for

	Hydrogen.	Carbon.	Oxygen.
1 atom alcohol consists of	3 atoms	+ 2 atoms	+ 1 atom
1 atom carbonic acid gas of		1 atom	+ 2 atoms
which make together	3	+ 3	+ 3

or three atoms of fugar.

Now this determination very nearly coincides with the actual experiments of Lavoisier, and the more recent determination of Thenard, respecting the proportional quantities of these two products obtained by the fermentation of fugar. Thus 100 parts of fugar (as deduced by Dr. Thomson from Thenard's experiments) were converted into

Alcohol	-	-	57.44
Carbonic acid	-	-	42.56
			100.

Whereas the proportions, according to the above calculations, ought to have been

Alcohol	-	-	51.12
Carbonic acid	-	-	48.88
			100.

A coincidence as near as could have been expected, considering the very difficult nature of the experiment.

With respect to the *modus operandi* of ferments, we have nothing to add, but that the subject still remains a mystery. See WINE, and YEAST.

FERRABAD, in *Geography*, a town of Mazanderan, in Persia, situated at the mouth of a river, 30 miles E. of the village of Meshed Sir, which carries on a small trade in rice, salt-fish, and pottery.

FERRISBURGH, a town of Addison county, in Vermont, having 1647 persons.

FERROCYANIC ACID, in *Chemistry*. See CYANOGEN. FERRURETTED *Chyazic Acid*. See CYANOGEN.

FEVRE, or FABRI, JAMES DE. *Add*—See FABER, JACOBUS STAPULENSIS.

FEZA, in *Geography*, a small town of Persia, 18 furlongs from the capital of Fars or Farfistan, having about 4000 inhabitants, on the banks of a small stream, which is totally absorbed in the irrigation of the gardens and fields adjoining the town.

FIBRIN, *Chemical Properties of*. See BLOOD.

FIBROLITE. See MINERALOGY, *Addenda*.

FICARIA. Refer to RANUNCULUS *Ficaria*.

FIDUCIAL EDGE. See PLAIN TABLE, and CIRCLE.

FIDUCIAL LINE. See LINE.

FIELD-SCABINS, *r.* FIELD-Scabious.

FIELD-Fortification, col. 6, l. 23 from the bottom, for at top *r.* at top and at bottom.

FIFESHIRE, col. 3, l. 32, *r.* 1811; l. 33, *r.* 17, 518—101, 272.

FIGURE, in *Heraldry*, col. 2, l. 12, for *passive r. passant*.

FIGURED, in *Manusures*, last line but three, for the turning *r.* then turning.

FINLEY, in *Geography*, a town of Washington county, in Pennsylvania, having 1636 persons.

FIRMAN. *Add*—In general, it denotes an order or mandate, and is applied to any imperial decree, or royal grant or charter,

FIRMNESS,

FIRMNESS, *l. ult.* after gold, add—or platina. Col. 2, 1. 7, for motion *r.* notion.

FIROZEABAD, an ancient city of Fars, in Persia, founded by Artaxerxes Babegon, which became the capital of Firoze Shah, the grandson of Nahirvan. Its ruins occupy a large space in a plain about 17 miles in length, and half as wide. Here are the remains of Attafh Kudda, or fire-temple of Firoze Shah.

FIRUZABAD. See the preceding article.

FISCARD, *l. ult. r.* 250. Col. 2, 1. 2, *r.* 1811—391—1572; *l.* 14, *dele* lately and received; *l.* 15, for Fridays *r.* Thursdays; *l.* 22, *dele* having been recently afflicted by the erection of a pier; *l.* 28, for about fifty *r.* several; *l.* 29, *r.* from 30 to 100 or more tons burned; *l.* 40 and 41, *r.* at a distance near St. David's is a vault, &c.

FISCHERA, in *Botany*, so named by professor Sprengel, in honour of his pupil Mr. Ferdinand Fischer, now curator of the Kazoumoffsky garden, near Moscow.—Spreng. Prodr. Umbell. 27. (Azorella; Labill. Nov. Holl. v. 1. 73.)—Clafs and order, *Pentandria Dignia*. Nat. Ord. *Umbellatae*.

Eff. Ch. Fruit ovate, solid, corrugated and mucicated. General and partial involucre of many leaves. Perianth of five deciduous teeth. Petals ovate, undivided.

1. *F. lanceolata*. Lanceolate Fischer. Spr. n. 3. (Azorella lanceolata; Labill. 74. t. 99.)—Leaves linear-lanceolate, keeled.—Native of Port Jackson, New South Wales, *Dr. White*; of Lewin's land, *Labillardiere*. Stem shrubby, twelve or eighteen inches high, with roughish branches. Leaves scattered, numerous, spreading, entire, smooth, an inch and a half long; tapering at the base. Umbels terminal, stalked, compound, many-flowered.

2. *F. ovata*. Ovate Fischer. Spr. n. 4. (Azorella ovata; Labill. 74. t. 100. Trachymene ovata; Spr. Umb. 8.)—Leaves elliptic-ovate, triple-ribbed.—From the same countries. Differs from the foregoing chiefly in the broader shorter figure of the leaves, and the more evident combination of their ribs. We suspect Labillardiere has confounded a more lanceolate variety of the present with his real *lanceolata*.

3. *F. linearis*. Linear Fischer. (*F. linearifolia*; Spr. n. 2. Azorella linearifolia; Cavan. Ic. v. 5. 57. t. 485.)—Leaves linear-awlshaped.—Native of Port Jackson. *Dr. White*. Like the two former in habit, but the small, narrow, heath-like leaves seem to distinguish it, if the foliage of this genus can at all be trusted for specific characters.

We conceive the compound umbels, totally different habit, more oblong less flattened fruit, and other characters above indicated, must keep these plants generically distinct, both from the original *Azorella*, (see BOLAX,) and from Mr. Rudge's TRACHYMENE, hereafter described, though the learned Sprengel now refers them to the latter. His *T. compressa* (Azorella compressa; Labill. t. 101.) appears not well to accord with either, in character or habit. The fruit is broader than long, tumid and reticulated, not rough. Umbels compound.

FISH, *Anatomy of, dele* all the references to plates.

Under *Kidnies and Urinary Bladder*, col. 2, 1. 46, *dele* the paragraph beginning—It may, and ending, place.—Under *Brain*, col. 4, 1. 12, *dele* after usual, and begin—immediately, &c. Under *Integuments*, col. 2, 1. 10 from bottom, *r.* renewed. Col. 5, *dele* after skin, 1. 3 and 1. 4. Under *Organs of Vision*, col. 5, 1. 15, for the refragibility of the humour *r.* it. Under *Electric Organs*, col. 2, 1. 15 from bottom, for hexagonal *r.* pentagonal; 1. 14, for one or two *r.* two or three.

FISHERY, PILCHARD, col. 2, 1. 24, for 35,000 *r.* 35,000.

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FISHERY, *Salmon*, col. 3, 1. 7, for strikes *r.* strike; 1. 8 from bottom, for killed *r.* kitted.

FISHERY, *Whale*, col. 2, 1. 29, after split, add—wood. Col. 4, 1. 17 from bottom, for forty-two *r.* sixty-six; 1. 5 for six harpooners *r.* one or two harpooners.

FITZBURG, in *Geography*, a town of Worcester county, in Massachusetts, having 1566 persons.

FITZJAMES, 1. 8 from bottom, for France *r.* Spain.

FITZWILLIAM, 1. 5, *r.* 1301.

FIXED BODIES, 1. 20, after silver, add—and platina.

FLAG, col. 2, 1. 7, since Nov. 1805, the red flag at the main-mast has been the first in rank after the union flag.

FLAHERTI, 1. 7 from bottom, after Scottish *r.* and Irish; 1. 5, *dele* Irish.

FLAME, col. 8, 1. *ult.* add—This experiment should be cautiously performed.

FLAX-DRESSING, col. 2, 1. 2. See a "Notice of a Method of Bleaching Flax in Half an Hour, without the Use of Acids or Alkalies." Anderfon's Bee, vol. x. p. 335. Col. 2, 1. 25, *r.* distance.

FLAX Foot-Brake, 1. 29, *r.* higher than the distance.

FLAX-Seed Jelly, col. 2, 1. 32, for oils *r.* foils.

FLEMING, 1. 5, *r.* 8947, and 549.

FLEMINGIA, in *Botany*, so called in just commemoration of Dr. John Fleming, the able president of the East India company's medical board at Bengal.—Roxb. Corom. v. 3. 44. Ait. Hort. Kew. v. 4. 349.—Clafs and order, *Diadelphica Decandria*. Nat. Ord. *Papilionaceae*, Linn. *Leguminosae*, Juss.

Eff. Ch. Calyx five-cleft. Standard striated. Legume sessile, oval, turgid, of two valves, with two spherical seeds.

Six species are defined in Hort. Kew. all from the East Indies. *F. striata*, Roxb. t. 248, and *semialata*, t. 249, have handsome axillary spikes of crimson flowers: *strobilifera*, which is *Hedyfarum strobiliferum* of Linnæus, has simple leaves; all the rest are ternate.

FLETCHER, 1. 2, *r.* 382.

FLEUR-DE-LIS. See FLOWER-DE-LUCE.

FLEUR DE LIA, *r.* FLEUR DE LIFFE.

FLINDERSIA, in *Botany*, in honour of capt. Flinders; commander of the botanical expedition in which Mr. Brown was employed.—Br. Bot. of Terr. Austr. 63.—Clafs and order, *Pentandria Monogynia*. Nat. Ord. *Cedrelee*, Br.

Eff. Ch. Calyx five-cleft, inferior. Petals five. Nectary cup-shaped, bearing the stamens, with five intermediate barren filaments, opposite to the petals. Capsule woody, of five valves, and five cells, with as many loose partitions. Seeds winged, two in each cell.

1. *F. australis*. Br. t. 1.—A tree found on the east coast of New Holland, lat. 23°. Leaves ternate or pinnate, entire. Panicles cymose, downy. Capsules mucicated.

Arbor radulifera, Rumph. Amb. v. 3. 201. t. 129, is supposed to belong to this genus.

FLOAT-STONE. See MINERALOGY, *Addenda*.

FLOOR, in *Building*, col. 2, 1. 37, for heading points *r.* heading joints.

FLORAL GAMES, 1. 10, add—It is said that Clementina-Isaura, countess of Thoulouse, published an edict that assembled all the poets of France with artificial crowns, dressed with flowers, &c. Warton's Hist. of Poetry, vol. i. p. 467.

FLORIDA, col. 2, 1. 1, after Appalachiola, add—and Pearl river, N. by 31° N. lat. and S. by Bayou Iberville, Amite river, and lakes Maurepas and Pontchartrain; extending over 4850 square miles of surface. Soon after the incorporation of this part of W. Florida into the state of Louisiana, it was divided into the four parishes of Baton Rouge, New Feliciana, St. Helena, and St. Tammany. The rivers are, the Mississippi, the Comite, Amite, Tickfah,

Tangipoo, Chifuneté, Bogue Chito, and Pearl. The Comite rises in Wilkinson county, in the Mississippi territory, and, after a course of forty miles, falls into the Amite. The Amite rises in the same territory in Amite county, and having joined the Iberville, falls into lake Maurepas, after a course of 100 miles. The Tickfah rises in the same territory, and after entering W. Florida, becomes much augmented, and pursuing a fourth course of fifty miles falls into lake Maurepas. The Tangipoo rises in the same territory, and running nearly S. 70 miles, falls into lake Pontchartrain. The Chifuneté rises in W. Florida, and pursuing a course of about 60 miles, enters into lake Pontchartrain. The thriving town of Madisonville lies on its banks. The Bogue Chito has its source in the Mississippi territory, and after a S.E. by S. course, enters the PEARL River; which see.

FLORIDA, a town of Berkshire county, in Massachusetts, containing 392 inhabitants.

FLORIN, col. 2, l. 19, after divisions, add—A florin is a silver coin in Holland, Flanders, and Germany, called also “Guilder,” or “Gulden.” Accounts are kept in Holland in guilders or florins of 20 stivers, each subdivided into 16 pfenings. A six-dollar is worth 2½ stivers, and a pound Flemish is equal to 6 guilders; hence, the six-dollar being = 3s. 4d. Flemish, the gilder is = 3s. 4d. Flemish. A gold gilder, with which accounts are kept in the coin-trade, is worth .28 stivers. Among the coins are stamped gold guilders at 28 stivers, untamped do. at 26 stivers. A gold gilder of 28 stivers must weigh 407 Dutch asses, or 301 English grains. In Germany, they have gold florins, or guildens, which are chiefly current in the countries on the banks of the Rhine, passing generally for 2 six-dollars current, and they are to contain 18½ carats of fine gold, 3½ carats of fine silver, and 1½ carats of copper. The Hanoverian gold florins contain 18½ carats of gold, 3½ carats of silver, and 1½ carat of copper. The gold florin is a gold coin in Hanover, and other parts of Germany; but the gold gilder in Holland is a silver coin. See TABLE of Coins under COIN and EXCHANGE.

FLOYD, l. 4, r. 3453 and 113.

FLUATES, in *Chemistry*. See FLUORIC Acid.

FLUGEL-MAN, in *Military Language*, a well-drilled intelligent soldier, advanced in front of the line to give the time in the manual and platoon exercises. The term *flugel* is derived from the German, and signifies a wing; the man having been originally posted in the front of the right wing.

FLUIDS, *Animal, Chemical Properties of*. The blood is the general source of all other animal fluids, most of which, more or less, resemble it in their properties. The operation by which other fluids are formed from the blood is termed *secretion*. See BLOOD and SECRETION.

Berzelius divides secreted fluids into two classes; namely, the *secretions* properly so called, or the fluids intended to fulfil some ulterior purpose in the animal economy; and the *excretions*, which are directly discharged from the body. The fluids of the former class, according to this distinguished chemist, are all *alkaline*; of the latter, all *acid*. The excretions are, the urine, the perspirable fluid, and the milk; all the other fluids appear to belong to the former class. The alkaline secreted fluids may be divided into two very distinct species. The former of these contains the same quantity of water as the blood, so that the change induced by the nervous influence seems to be confined to that of altering the chemical form of the albuminous materials, without affecting their relative proportions to the water and other substances dissolved in the blood. The bile, spermatic fluid, &c. are of this kind. The latter species consists of fluids, in which the influence of the nervous system has separated a large por-

tion of the albuminous matter, and left the remaining liquid proportionally more watery. The saliva, the humours of the eye, and the effused serum of membranes, are of this species; and in these, the quantities of salts, and in general also of alkali, are the same as in the blood.

The influence of the chemical agent of secretion is therefore, according to Berzelius, chiefly spent upon the albuminous materials of the blood, which seem to be the source of every substance that peculiarly characterises, and is the principal constituent of each secretion, and which is *sui generis*. All the other parts of the secretion seem to be rather accidental, and to be found there only, because they were contained in the blood out of which the secretion was formed.

The *excretions* are of a more compound nature. They all contain a free acid, which is the *lactic*, and in the urine this is mixed with the uric acid. Urine seems to contain only a single peculiar characteristic matter, but milk has as many as three, namely, butter, curd, and sugar of milk. The perspired fluid appears to have no peculiar matter, but to be a mere watery fluid with hardly a vestige of the albumen of the blood, and in short to be the same as the other excreted fluids would be if deprived of their peculiar matter.

An account of most of the animal fluids will be found under their proper heads. The following is a tabular view of the analyses of what have been termed *albuminous fluids*, many of which have been omitted.

Name of Fluid.	Albumen.	Incoagulable matter, &c.	Salts.	Water.
Fluid from spina bifida	.5	.7	1.0	97.8
Liquor pericardii	5.5	2.0	.5	92.0
Ditto	3.0	1.0	1.0	95.0
Fluid from hydrocephalus	.12	.28	1.0	98.6
Fluid from hydrocele	6.85	1.1	0.8	91.25
Liquor amnii	.16	.1	1.4	98.34
Fluid from ascites	4.25	1.0	1.0	93.75
Fluid from a blister	6.0	.14	1.0	92.86
Ditto *	18.	—	4.0	78.0
Albumen ovi	12.0	2.7	0.3	85.00

The above are the results of Dr. Boftock's experiments, with the exception of the fluid from a blister marked *, which is taken from Margueron.

With respect to the nature of the *incoagulable matter and salts*, they are the same as those constantly found in the serum of the blood; we refer our readers therefore to what we have said on this subject under the article BLOOD.

FLUOBORIC ACID, in *Chemistry*. See FLUORIC Acid.

FLUORIC ACID. Since this article was written for the Cyclopaedia, many important additions have been made to our knowledge respecting fluoric acid, which deserve to be mentioned here.

Pure fluoric acid, according to Gay Lussac and Thenard, may be obtained by distilling together in lead vessels a mixture of one part of white fluor spar in a state of powder, and two parts of concentrated sulphuric acid. The lead receivers must be kept as cool as possible by a mixture of common salt and snow or ice.

Fluoric acid thus obtained is, at 32°, a colourless liquid, like water. It remains a fluid between —4° and 60°. Its boiling point has not been determined, but it is low. When exposed to the air it smokes violently, giving out a smell similar to that of muriatic acid, but much stronger. It is very speedily dissipated in the open air, and can only be preserved in metallic vessels. Those best adapted for the purpose are made of pure silver, with air-tight silver stoppers. This acid, according to Davy's experiments, when as concentrated as possible,

possible, contains no water. In this state, its specific gravity is 1.0609. When united to a certain portion of water, its specific gravity becomes as high as 1.250. When a drop is let fall into water, a hissing noise is heard, similar to that occasioned by a hot iron. When a few drops of water are let fall into fluoric acid, it enters into ebullition. A large proportion of water may be added without destroying its fuming property. Care must be taken not to breathe the fumes of this acid, as they are very deleterious. When a drop of it falls upon the skin, it acts as a powerful corrosive, and occasions a sore which does not soon heal.

Respecting the nature of this acid, the opinion of the older chemists, and even of Gay Lussac and Thenard, was, that it is composed of an unknown basis and oxygen. M. Ampere, however, started the notion that it is analogous to muriatic acid, or a compound of hydrogen, and a supporter of combustion, to which the name of *fluorine* has been given; and this opinion has been since supported by Sir H. Davy, and though its truth has not been absolutely demonstrated, yet upon the whole perhaps it is the most probable. On this supposition, fluoric acid is a compound of one atom fluorine, and one atom hydrogen. See *SIMPLE BODIES*.

Fluoric acid combines with all the bases forming fluates.

Fluate of Ammonia.—This salt may be formed by saturating pure fluoric acid with ammonia. It is neutral when first formed, but becomes acid when evaporated. It does not crystallize, but when heated, flies off in thick white vapours.

Fluate of Potash.—This salt may be formed in the same manner as the last. It has a very sharp taste, crystallizes with difficulty, is very deliquescent, and of course soluble in water. When heated, it undergoes first the aqueous, and afterwards the igneous fusion. Sulphuric acid decomposes it, driving off fluoric acid in vapour.

Fluate of Soda.—This salt may be formed as above. It has much less taste than fluate of potash. It is not altered by exposure to the air, and is rather more soluble in hot than in cold water. On cooling, therefore, it separates in small crystals, or more frequently in the form of a solid and transparent crust on the surface of the water.

Fluate of Lime.—This salt exists abundantly native. It is called FLUOR SPAR (which see), and is the substance from which this acid is always obtained. It is composed, according to Davy's analysis, of

Fluorine	-	20.	-	100.
Calcium	-	26.25	-	131.25

Fluate of Barytes.—This salt is tasteless, insoluble in water, but soluble in excess of fluoric acid, and likewise in nitric and muriatic acid. It is composed of

Fluorine	-	20.	-	100.
Barium	-	87.5	-	437.5

Fluate of Strontian.—This salt possesses the same properties as fluate of barytes.

Fluate of Magnesia.—This is a tasteless powder, insoluble in water, and scarcely soluble in acids.

Fluate of Ytria, *Fluate of Alumina*, and *Fluate of Zirconia*, are likewise white insoluble powders. The

Fluate of Glucina is soluble in hot water, and precipitates in small crystals as the water cools.

It is extremely probable, as Dr. Thomson remarks, that the above salts are in reality *fluorides*, or compounds of *fluorine*, with the metallic bases of the earths.

The metallic fluates are not upon the whole an interesting class of bodies. The *fluates of iron, manganese, zinc, and tin*, are white insoluble powders. The *fluate of cobalt* is of a red colour. The *fluate of lead* exists in the form of brilliant plates. The *fluate of copper*, of small blue-coloured soluble

crystals. The *fluate of mercury* of small lamellar yellow crystals. The *fluate of silver* is very soluble in water, and does not crystallize. It cannot be formed by the direct union of fluoric acid and silver; but it is formed when fluate of mercury is made to act upon silver.

Fluoboric Acid.—Fluorine has the property of combining with boron, and forming an acid which has received the above appellation. It may be formed by mixing together in a retort one part of finely pounded fused boracic acid, and two parts of fluor spar in powder, and twelve parts of sulphuric acid. The heat of a lamp is then to be applied, and the acid comes over in the form of a gas, which must be received over mercury. For this process we are indebted to Dr. John Davy, but the acid itself was first discovered by Gay Lussac and Thenard in 1808.

Fluoboric acid thus obtained is colourless, and possesses the mechanical properties of common air. Its smell is similar to that of muriatic acid, and its taste is exceedingly acid. It instantly gives a red colour to vegetable blues. Its specific gravity, as determined by Dr. Davy, is 2.3709. Water absorbs about 700 times its bulk of this gas, and becomes slightly viscid, like sulphuric acid, and like it requires a high temperature to make it boil. It also chars animal and vegetable substances, and is capable of forming an ether when distilled with alcohol. It combines with the different bases, and forms a class of salts called *fluoborates*, which have been little examined. On the supposition that it is a compound of *fluorine* and *boron*, which seems to be the most probable opinion, its composition will be

Fluorine	-	20.	-	100.	-	228.57
Boron	-	8.75	-	43.75	-	100.

Fluosilicic Acid.—Fluorine has also the property of combining with *silicon*, and forming a powerful acid. This compound was first discovered by Scheele, but it is to Dr. J. Davy that we are principally indebted for the correct account of its properties. It may be formed by putting a mixture of equal parts of pounded fluor spar and glass into a retort, and pouring over the mixture sulphuric acid sufficient to convert the whole into a paste. Heat is then to be applied, and the acid speedily comes over in the form of a gas, and may be collected over mercury. Fluosilicic acid gas is colourless, and possesses the mechanical properties of common air. Its smell resembles that of muriatic acid. It smokes when allowed to escape into the atmosphere. It instantly reddens vegetable blues. Its specific gravity, according to Dr. Davy, is 3.5735. Water absorbs about 263 times its bulk of it, but at the same time it is partly decomposed, and silica is deposited. When passed through liquid ammonia, the whole of the silica is deposited in the form of silica: this enabled Dr. Davy to effect its analysis, the result of which appears to shew that it is a compound of one atom silicon and one atom fluorine.

The *fluosilicates* have not been much examined. The *fluosilicate of lime* exists abundantly native, and has not hitherto been distinguished from fluor spar. It may, however, be easily recognised by heating it in metallic vessels with sulphuric acid, when it yields fluosilicic acid gas, while fluor spar does not.

FLUORINE. See *FLUORIC ACID*.

FLUOSILICIC ACID, FLUOSILICATES. See *FLUORIC ACID*.

FLUTE TRAVERSIERE. See *TRAVERSIERE*.

FLUVANNA, l. 5, r. 4775, of whom 2142 are slaves.

FOAL-BIRTH. See *AGE of the HORSE*, and *HORSE*.

FOLKINGHAM, or FALKINGHAM, l. 5 and 6, r. 106 houses, and 659 inhabitants.

FOLKSTONE, l. 15. In 1811 this town contained 765 houses, and 3697 persons; viz. 1673 males, and 2024 females: 23 families being employed in agriculture, and 157 in trade and manufactures.

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FOOD, col. 9, l. 1, for animal *r.* gramineal or gramineous.

FORCE, col. 28, *dele* the paragraph from 1. 3 to l. 6. Col. 38, under Force, l. 1, infert—6; l. 2, .69. Under Continuation, l. 4, 1'; under *Day's work*, l. 4, r. 2. Col. 39, under *Performance of Men by Machines*,—Continuance, l. 1, 145th; l. 2, 2'. Col. 41, under *Work of Mules*, l. 1, r. Cazand; l. 23, r. 72 horses, and burns a chaldron, &c.

FORCEPS, col. 2, l. 30 from bottom, *r.* Rueff; l. 19, *r.* Mauriceau Pratique.

FORDINGBRIDGE, l. 11, *r.* 1811; l. 12, *r.* 445—2259; l. 13, *r.* 281.

FORDOUN. In 1811 this parish contained 513 houses, and 2535 persons; viz. 1197 males, and 1338 females.

FORDYCE, a parish of Bamff county, in Scotland, containing 641 houses, and 2767 inhabitants.

FORFAR, l. 21, *r.* 1811; l. 22, *r.* 759—5652.

FORFARSHIRE. Add—By the return of 1811, this county had 16,135 houses, occupied by 107,264 persons; 48,151 being males, and 59,113 females: 4980 families employed in agriculture, and 13,616 in trade and manufactures.

FORFICULA, col. 2, under *AURICULARIA*, add—The popular dread in which this insect is held, from an apprehension of its entering the cavity of the ear, and piercing the tympanum, is now generally considered as an ancient and vulgar error.

FORMIC ACID, in *Chemistry*. The distinct nature of this acid appears now to be generally admitted by chemists. In its sensible properties, it approaches the acetic acid. But Suerfen has shewn, that it has the property of neutralizing much less of alkaline bodies than acetic acid. Gehlen also has shewn, that the formiates of soda and copper, differ altogether from the acetates of the same bases. Berzelius has lately analysed this acid with his usual precision: according to him, it is composed of

Hydrogen	2.84	} which nearly cor-	1 atom hydrogen.		
Carbon	32.40			} respond with	2 atoms carbon.
Oxygen	64.76				

Hence it appears to resemble oxalic acid closely in its composition.

FORRES, l. 4, after Moray, add—or Elgin; l. 12, *r.* 1811—672; l. 13, *r.* 2925, and 295 families, &c.

FORTH, col. 2, l. 7, for Camburkenneth, *r.* Camburkenneth.

FORTIFICATION, col. 7, l. 4 from bottom, for Four *r.* Your.

FORTIFICATION, *Profile of a*, l. 14, for 3 toises 18 feet *r.* 3 toises or 18 feet.

FOSSÉ, col. 2, l. 44, for thus *r.* then.

FOSSIL COPAL. See *MINERALOGY, Addenda*.

FOSTER, l. 2, *r.* 2613.

FOTHERINGHAY, l. 28, *r.* 1587. Col. 2, l. 15 and 16, *r.* and the whole parish contains 55 houses, and 313 persons.

FOUNDERY—*The manner of casting bells*, col. 2, l. 6, for $\frac{1}{2}$ *r.* $\frac{1}{2}$.

FOURTH, col. 2, l. 3, *r.* Fourth, *Great Sharp*.

FOURTH, *Greatest Sharp, r. Great*.

FOWEY, col. 2, l. 20 from bottom, *r.* 1811; after

houses—in the borough and parish was 227, containing 1319 inhabitants.

FOWLER, a township of Trumbull county, in Ohio, having 224 inhabitants.

FOX, GEORGE, col. 2, l. 25, *r.* led people.

FOXBOROUGH, l. 4, *r.* 870.

FOYERS, l. 9, *r.* moffy; l. 11, *r.* breach; l. 15, *r.* astonished rents; l. 16, *r.* ceafelefs; l. 17, after wide, infert—a comma.

FRAGUIER, col. 2, l. 31, after farther on."

FRAISED RAILS, l. 12, for rails *r.* posts; and in l. 11, for rails *r.* fraifes.

FRAMINGHAM, l. 3, *r.* 1670.

FRANCE, col. 26, l. 16, add—See *French REVOLUTION*. Col. 33, l. 5, for theds *r.* fluds.

FRANCESTOWN, l. 5, *r.* 1810 and 1451.

FRANCO, col. 5, l. 11 from bottom. N. B. the tails should not have been black.

FRANCONIA, in America, l. 4, *r.* 358. Add—Also, a township of Montgomery county, in Pennsylvania, having 656 inhabitants.

FRANKFORT, l. 3, *r.* 1493; l. 4, for village *r.* borough.—Col. 2, l. 1, infert—1233 inhabitants; add—Also, a town of Suffex, in New Jersey, containing 1637 inhabitants.—Also, a town of Cumberland county, in Pennsylvania, having 807 inhabitants.

FRANKLIN. Add—The following is an authentic copy of Franklin's epitaph, transcribed from his correspondence, in his own hand-writing. "The body of B. Franklin, like the cover of an old book, its contents torn out, and stripped of its lettering and gilding, lies here, food for worms. But the work shall not be wholly lost; for it will, as he believed, appear once more in a new and more perfect (elegant) copy, corrected and amended (revised and corrected, P. C.) by the Author. He was born, Jan. 6, (Jan. 17, original), 1706. Died 17—"

FRANKLIN, in *Geography*, l. 3, *r.* 19; l. 4, *r.* 16,427; l. 14, *r.* 23,083; l. 16, containing 159 inhabitants; l. 20, *r.* containing 5730 inhabitants, of whom 709 are slaves; l. 24, *r.* 6914; l. 25, *r.* 1794; l. 26, after Franklin, containing 1099 persons, of whom 407 are slaves; l. 27, *r.* 10,166—5330; l. 41, *r.* 10,815—1656; l. 45, *r.* 1398; l. 54, *r.* with 1542 inhabitants; l. 55, for three *r.* five; after York county, having 706 inhabitants, in Huntingdon county, with 571, in Franklin county, with 1781, in Fayette county, with 1623, in Greene county, with 1943 inhabitants; l. 58, *r.* 1161; l. ult. after Ohio, add—with eight townships, and 3484 inhabitants.—Also, a township of Portage county, in Ohio, having 230 inhabitants.—Also, a township of Rofs county, in Ohio, having 725 persons.—Also, a township of Ohio, in Scioto county, having 217 persons.—Also, a township of Warren county, in Ohio, having 2302 persons.—Also, a county of New York, containing 2617 inhabitants.—Also, a town of Somerset county, in New Jersey, containing 2539 inhabitants.—Also, a town of Bergen county, in New Jersey, having 2839 inhabitants.—Also, a county of the territory of Mississippi, containing 2016 inhabitants, of whom 735 are slaves.

FRANKS, l. 3, *r.* 1114.

FREDERICK I. col. 2, l. 14, after Urban III. infert—claim of.

FREDERICK, l. 12, *r.* 34,437; l. 13, *r.* 3671. Col. 2, l. 2, *r.* 22,574 inhabitants, of whom 6117 are slaves.

FREDERICK, a township of Montgomery county, in Pennsylvania, having 828 inhabitants.

FREEHOLD, l. 4, *r.* 1810—4784; l. 7, *r.* 1810—3843.

FREEMAN,

FREEMAN, a township of Maine, in Somerfet county, having 237 inhabitants.

FREEMAN, l. 5, r. 2184.

FREEZING, l. 15, r. 11.

FRENCH Creek, in *Geography*, a township of Mercer county, in Pennsylvania, having 183 inhabitants.

FRICTION, *Calculation of the Quantity of*, col. 2, l. 22, r. a third part of its own weight.

FRIENDSHIP, in *Geography*, a town of Maine, in the county of Lincoln, having 480 inhabitants.

FRODSHAM, l. 11 from the bottom, r. 1811; l. 10, r. 262, and 1344.

FROME, l. 17 from the bottom, r. 1811—1722; l. 16, r. 9493, and *dele* But this estimate is glaringly defective.

FRUIT-FLIES, col. 2, l. 14, r. these Inails.

FRUIT-Stones, l. 5 from the bottom, for cuts r. coats; l. ult. r. these seeds, &c. were carried off.

FRYBURGH, l. 2, for York r. Oxford; l. 4, r. 1004.

FUNGI, *Chemical Properties of the*. Braconnot has lately detected three distinct new principles in this class of plants. Two of these are acids, one of which he has denominated *boletic acid*, the other *fungic acid*; the third is a principle neither acid nor alkaline, to which he has given the name of *fungin*. We shall briefly describe here the leading properties of each of these principles.

Boletic Acid.—This was obtained from the juice of the *boletus pseudo-ignarius*. Its colour is white; it is not altered by exposure to the air, and its crystals are irregular four-sided prisms. Its taste is similar to that of tartar. It is soluble in 180 times its weight of water at a temperature of 68°, and in 45 times its weight of alcohol. The aqueous solution reddens vegetable blues. It combines with the different bases forming *boletates*, which have been but little examined. The *bolete* of ammonia crystallizes in flat four-sided prisms, and is soluble in 26 times its weight of water at 68°. The *bolete* of *potash* is very soluble in water, and crystallizes with difficulty. The *bolete* of lime crystallizes in flat four-sided prisms, and is soluble in about 110 times its weight of water at 72½°. No one hitherto appears

to have repeated the experiments of Braconnot on this acid.

Fungic Acid.—This was extracted from the *boletus juglandis*, and other fungi. This acid is colourless, does not crystallize, has a very four taste, and when evaporated to dryness, deliquesces on exposure to the air. The *fungates* of *potash* and *soda* do not crystallize, are very soluble in water, but not in alcohol. The *fungate* of ammonia crystallizes in regular six-sided prisms. The *fungate* of lime is not altered by exposure to the air, and is soluble in about 18 times its weight of water at 73°.

Fungin.—This substance approaches woody fibre in its properties, but seems to be sufficiently distinguished from it by various characters, particularly by constituting a nourishing article of food, and by being less soluble in alkaline leys.

FUNGUS of the *Antrum*, l. 13, for he r. she.

FURCRÆA, in *Botany*, after M. Fourcroy, the great chemist.—Venten. in *Ult. Annal.* v. 19. 54. *Ait. Hort. Kew.* v. 2. 302.—Class and order, *Hexandria Monogynia*. Nat. Ord. *Coronarie*, Linn. *Bromeliæ*, Juss.

Eff. Ch. Petals six, superior, spreading. Filaments shorter than the corolla, obovate in their lower part. Style triangular, thickened at the base.

F. gigantea, De C. Pl. græs. (*Agave fœtida*, Linn.) and *F. tuberosa*, (*A. tuberosa*, Willd. Sp. Pl. v. 2. 194.) are the only species.

FURIGES, col. 3, l. 22, r. those serpents.

FURR, in *Heraldry*, the 4th paragraph, r. Furrs either consist of one colour (which is white, but cannot be used in arms singly), or more than one; and these either two, or more than two.

FURRINGS, in *Architecture*. Add—Joists are furred, by which operation the uneven joists of an old floor are levelled for the reception of the flooring boards.

FURZE, col. 4, l. 18, for *l. 16.* r. *3l. 12.*, the furze being cut only every other year.

FURZE-Mill, col. 2, l. 20, for melted cake r. melted coke.

FUSION, col. 2, l. 20 from the bottom, *dele* all and except gold.

G.

G, l. 21, after *fung*, &c. add—It has been asserted, however, by an ingenious correspondent, that he finds this so far from the fact, that G hard is easily founded with any of the vowels, either before or after it, whilst the tongue is probably kept at the bottom of the mouth; nor does he believe that the pressure here described is at any time necessary for the pronunciation of this letter. It does indeed take place in two of the three examples here given, *viz. gate*, *go*, and *geld*; but it is for the formation of the letters *t* and *l*. This pressure takes place also with the G soft.

GADUS. Obf. Some species, *viz. Molva*, *Albidus*,

Tau, *Lota*, *Mustela*, *Tricirratu*, and *Cimbrius*, all *bearded*, are arranged in the same division, the character of which is *without beards*.

GAGE, in *Carpentry*, l. 9, for a staff r. the stick; for to strike r. or strike; l. 10, for staff r. stuff; l. 11, for it r. the tooth.

GAINSBOROUGH, l. 9 from bottom, for quadrangular r. quadrangle.

GALANAR, l. 3, add—See ALPINIA, *Addenda*.

GALAPAGOS, col. 1, l. 5 from bottom, for 68° r. 86° or 89°; *dele* the paragraph.

GALARDIA, in *Botany*, Lanarck Dict. v. 2. 590. Illustr.

Illustr. t. 708. Schreb. Gen. 573. Willd. Sp. Pl. v. 3. 2245. Ait. Hort. Kew. v. 5. 129. Pursh 572. Juss. 189. (Virgilia; L'Herit. Monogr.)—Clafs and order, *Syngenesia Polypetalia*. Nat. Ord. *Compositæ*.

Eff. Ch. Recept. hemispherical, chaffy. Seed-down of many chaffy scales. Calyx imbricated, many-leaved, flat. Radiant florets deeply three-cleft.

1. *G. bicolor*. Two-coloured Galardia. Willd. n. 1. Ait. n. 1. Pursh n. 1. (Virgilia helioides; L'Herit. t. 1, 2. Sm. Exot. Bot. v. 1. 71. t. 37.)—Stem branched. Leaves lanceolate. Scales of the seed-down awned, entire.—Found in dry sandy soil, from Canada to Florida. Annual. Flowers handsome, orange, variegated with red and purple.

We have already announced this genus under the VIRGILIA now established. There are two more species, *G. fimbriata* and *aristata*, from N. America.

GALEOPTHECUS, COLUGO, in *Zoology*, a genus of the order Primates, the characters of which are, that it has no front teeth in the upper jaw; that those in the lower are six, short, broad, distant, and pectinated; that the canine-teeth are very short, triangular, broad, sharp, and serrated; that the grinders are four, truncated and mucronated with conical protuberances; and that it has a flying-skin surrounding the body, limbs, and tail. For the description of this genus with appropriate figures, naturalists are indebted to Dr. Pallas; and it may be found in the Transactions of the Academy of Peterburgh for the year 1780. The galeopthecus volans, or flying colugo, is the lemur volans of the Linnæan system, and the flying macaco of Pennant's quadrupeds. It is a native of the Molucca and Philippine islands, where it feeds principally on fruits, and almost constantly resides on trees. It has two young ones, which are said to adhere to its breasts by the mouth and claws. Its whole length is about three feet, and of the same breadth when expanded; the tail is slender, and about a span long. Its expansive skin, which enables it to fly, is continued on each side from the neck to the fore-feet; thence to the hind-feet, and again to the tip of the tail. It is covered with fur, like the body of the animal; the upper side of which is generally of a deep aëch colour: the back, in animals that are full grown, is crossed transversely with blackish lines, having towards the edges a tinge of yellow; and the whole under-side, both of the body and membrane, is of a yellowish colour. The head is long, the mouth small, and the tongue fleshy, broad, rounded, attenuated on the edges, and ciliated with papillæ, and also slightly beset with papillæ on its surface. The legs are clothed with a soft yellow down, and on each foot are five toes, united by a common membrane, and terminating in very sharp crooked claws. The animal is called by the Indians caguang, colugo, and gigua. It is a gregarious animal, flies chiefly in the evening, and its body is said to be about the size of a cat. M. Geoffroy says there are two varieties; viz. one of the colour usually described; the other of a fine cinereous or ferruginous colour, vivid on the back and paler beneath, and without any variegations. It is suggested, that these may be merely sexual differences. Dr. Shaw has availed himself of Pallas's description and figure in the first vol. of his *Zoology*, to which we refer.

GALINSOGEA, in *Botany*, after the superintendent of the Madrid garden. "Ruiz and Pav. Prodr. 110." Ait. Hort. Kew. v. 5. 122.—Clafs and order, *Syngenesia Polypetalia*. Nat. Ord. *Compositæ*.

Eff. Ch. Recept. chaffy. Seed-down of many chaffy scales. Calyx imbricated.

1. *G. parviflora*, Cavan. Ic. t. 281.

2. *G. trilobata*, ib. t. 282.—Both natives of South America.

GALIUM, col. 2, l. 34, for dried *r.* fresh.

GALLATIN, l. 2, r. 3159, and 664.

GALLIC ACID, in *Chemistry*. This acid has been recently analysed by Berzelius. He found it composed of

Hydrogen	-	-	-	5.90
Carbon	-	-	-	56.64
Oxygen	-	-	-	38.36
				100.00

According to which analysis, the constitution of gallic acid is as follows:

3 atoms hydrogen	-	-	3.75
6 atoms carbon	-	-	45.
3 atoms oxygen	-	-	30.

and the weight of its atom will be 78.75

Gallic acid has been found in the following plants, in the different proportions stated.

Elm	-	-	7	Sallow	-	-	8
Oak, cut in winter	-	-	8	Mountain-ash	-	-	8
Horfe-chefnut	-	-	6	Poplar	-	-	8
Beech	-	-	7	Hazel	-	-	9
Willow (boughs)	-	-	8	Ash	-	-	10
Elder	-	-	4	Spanish chefnut	-	-	10
Plum-tree	-	-	8	Smooth oak	-	-	10
Willow (trunk)	-	-	9	Oak, cut in spring	-	-	10
Sycamore	-	-	6	Huntingdon or	-	-	10
Birch	-	-	4	Leiceifer willow	-	-	10
Cherry-tree	-	-	8	Sumach	-	-	14

GALLICIA, New, l. 5, *r.* Zacatecas.

GALLIAPOLIS, a township of Ohio, in the county of Gallia, containing 448 inhabitants.

GALVANISM, col. 3, l. 25, after inch, insert—a part.

GALVANISM, *Medical*. See VOLTAISM, and particularly ELECTRICITY, *Medical*.

GALVANOMETER, an apparatus constructed by Mr. Pepsy, by an alteration in Bennet's electrometer, adapted for measuring very minute quantities of electricity, and which perhaps could not be rendered sensible by any other means. This apparatus consists of a glass cylinder, covered with a lid, which is composed of two circular plates of brass, attached to a cork that fits into the cylinder. To the lid is fixed a thin slip of silver, the end of which hangs down in the body of the cylinder, and has a pair of gold leaves attached to it; and the whole is so contrived as to be capable of being moved nearer to, or farther from, the pieces of zinc which start up from the bottom of the cylinder. The pieces of zinc are so contrived, that the parts of them which project upwards from the bottom of the cylinder may be fixed at different distances from each other by means of a slide and screw. See a description and figure of this instrument in Boitock's "History of Galvanism," 8vo. 1819.

GAMING, col. 3, l. 30, r. 8 Geo. I.

GARDENING, l. 17, r. Loudon.

GARDINER. Add—containing 1029 persons.

GARDNER, l. 4, r. 815.

GARGLE, a disease of horned cattle, which consists of an external hard swelling in the dew-lap, which afterwards spreads to the breast and throat. For the cure, profuse bleeding is recommended; and then an opening is to be made in the dew-lap at the seat of the swelling, into which

are

are introduced the leaves of bear's-foot pounded; the opening is then sewn with two or three stitches, and thus will be produced a running which will cure the disease; or a common rowel will answer the purpose.

GARRARD. Add—It contains 8926 inhabitants, of whom, in 1810, 2000 were slaves.

GARSTANG, l. 3, r. 178 and 790.

GARUGA, in *Botany*, a very barbarous Indian name.—Roxb. *Corom.* v. 3. 5. Ait. *Hort. Kew.* v. 3. 37.—Class and order, *Decandria Monogynia*. Nat. Ord. *Melie*, Juss.

Ess. Ch. Calyx bell-shaped, five-cleft, bearing the stamens and the five equal petals. Stigma five-lobed. Drupa with several nuts.

1. *G. pinnata.* Roxb. t. 208.—A tree found on the mountains of India. *Leaflets* serrated. *Flowers* paniced, yellow. *Fruit* aulere, used for pickling. *Wood* soft.

GAS, col. 2, l. 25, after atmosphere, add—will be found under AIR, ATMOSPHERE, &c.; deleted under the head of PNEUMATICS.

GAS, in *Chemistry*. Great revolutions have taken place in the chemistry of the *gases* since this article was written for the Cyclopaedia. Not only have their number been increased, but the laws of their combination, expansion by heat, &c. have been further investigated, and in many instances found very different from those stated under the above article. Several of these particulars have been already given under the article ATOMIC THEORY, a few others remain to be mentioned here. The following table from Dr. Thomson includes the gases at present known.

1. *Simple gases.* Oxygen, chlorine, iodine vapour, hydrogen, azote, sulphur.
2. *Compound gases.*
 - a. Simple gases combined. Hydriodic acid, protoxyd of chlorine, protoxyd of azote. Muriatic acid, deutoxyd of azote, steam, ammonia.
 - b. Oxygen and a solid base. Sulphuric acid, sulphureous acid. Carbonic oxyd, carbonic acid.
 - c. Hydrogen and a solid base. Cyanogen, sulphuretted hydrogen, olefiant gas, carburetted hydrogen, hydroguret of phosphorus, bihydroguret of phosphorus.
 - d. Fluorine, chlorine, and cyanogen with a base. Fluoboric acid, chlorocyanic acid, hydrocyanic acid, chlorocarbonic acid.
 - e. Two solid bases. Sulphuret of carbon.
 - f. Triple or quadruple compounds. Hydriodic ether, chloric ether, sulphuric ether, muriatic ether, alcohol, oil of turpentine.

Combination of Gases with one another.—The important law first observed by Gay Lussac respecting the combination of gaseous bodies, and alluded to in our original article, is now, we believe, nearly universally admitted. This law is, that gaseous bodies always unite with reference to their volumes; that is to say, that either equal volumes of different gases combine together, or one volume of the one, with two, three, or more of the other, and not with any intermediate proportion; and further, that when a gaseous result is obtained by such union, the volume of this is either equal to the united volumes of the two gases, or to half,

one-fourth, or some other submultiple of the original volumes.

The combinations of gases with one another have been arranged by Dr. Thomson under the following heads.

1. Gases that unite by mere mixture, such are: Oxygen with nitrous gas, forming nitrous or nitric acid. Ammonia with vapour, forming liquid ammonia—with muriatic acid, forming muriate of ammonia—with fluoboric acid, forming fluoborate of ammonia—with fluosilicic acid, forming fluosilicate of ammonia—with carbonic acid, forming carbonate of ammonia—with sulphureous acid, forming sulphite of ammonia—with sulphuretted hydrogen, forming hydrofulphuret of ammonia.
2. Gases that may be mixed without any striking combination, though they are capable of uniting in certain circumstances, such are: Oxygen with hydrogen, forming water—with carbonic oxyd, forming carbonic acid—with azote, forming nitric acid—with chlorine, forming chloric acid—with sulphureous acid, forming sulphuric acid—with nitrous oxyd, forming nitric acid. Hydrogen with chlorine, forming muriatic acid—with iodine, forming hydriodic acid—with cyanogen, forming hydrocyanic acid. Chlorine with carbonic oxyd, forming chloro-carbonic acid.
3. Gases which mutually decompose each other when mixed together, such are: Oxygen with phosphuretted hydrogen. Chlorine with ammonia—with phosphuretted hydrogen—with carburetted hydrogen—with olefiant gas—with sulphuretted hydrogen—with nitrous gas. Sulphuretted hydrogen with nitrous gas—with sulphureous acid.
4. Gases which mix without spontaneous decomposition, but which may be made to decompose each other in particular circumstances, as on the approach of an ignited body, when electric explosions are passed through them, &c. These are more numerous than the preceding, and are as follow: Oxygen with sulphuretted hydrogen—with carburetted hydrogen—olefiant gas—vapour of ether—vapour of alcohol. Nitrous oxyd with hydrogen—with phosphuretted hydrogen—sulphuretted hydrogen—carbonic oxyd—carburetted hydrogen—olefiant gas—vapour of ether—vapour of alcohol—sulphureous acid. Nitric acid with hydrogen, and probably all the preceding combustible gases and vapours—with sulphureous acid. Nitrous gas with hydrogen—with sulphureous acid. Hydrogen with sulphureous acid—with carbonic acid. Vapour of water with carburetted hydrogen—with olefiant gas.

Combination of Gases with Liquids. Gases may be considered with reference to their combination with water and with other fluids. With respect to water, by far the most important of all fluids, gases may be divided into two classes; those that are absorbed in a small proportion, and those that are absorbed in a great. Almost all gases belong to the first class. In the following list of this class, the gases are arranged in the order of their absorption, beginning with the least absorbable: azotic gas—hydrogen gas—arsenical hydrogen—carburetted hydrogen—carbonic oxyd—phosphuretted hydrogen—oxygen gas—nitrous gas—olefiant gas—nitrous oxyd—carbonic acid—sulphuretted hydrogen.

The following laws seem to be pretty well established respecting the absorption of gases by water.

1. When the pressure, temperature, and purity of the water, are the same, water absorbs a determinate quantity of every individual gas.

2. Water of the fame temperature always takes up the same bulk of each gas, whatever be its density.

3. The proportion of any gas absorbed by water depends greatly upon the nature of the gaseous residue.

4. The proportion of gases absorbed by water is considerably influenced by the temperature.

All the very absorbable gases belong to the class of supporters, acids, or alkalis. The following is a list of such of them as have been hitherto examined, arranged in the order of their absorbability. Chlorine, cyanogen, sulphureous acid, fluosilicic acid, muriatic acid, fluoboric acid, ammoniacal gas.

When water is saturated with the above gases its bulk is augmented. Thus one cubic inch of water saturated with

	Cubic Inches.
Chlorine becomes	1.002 +
Sulphureous acid	1.040
Muriatic acid	1.500
Ammoniacal gas	1.666

With respect to the absorption of gases by other fluids less is known. It appears, however, that in general alcohol and oils absorb a much greater proportion of gases than water.

Our limits will not permit us to enter upon this subject so much as its importance demands, we must therefore content ourselves with presenting our readers with the following table of the proportions of different gases absorbed by water, according to the best experiments.

TABLE I.—Gases combining with Water in small Proportion.

At a temperature of 60°, 100 Measures of Water	absorb, according to		
	Henry.	Dalton.	Saussure.
Sulphuretted hydrogen	106	100	253
Carbonic acid	108	100	106
Nitrous oxyd	86	100	—
Olefiant gas	—	12.5	15.3
Nitrous gas	5	3.7	—
Oxygen gas	3.7	3.7	6.5
Phosphuretted hydrogen	2.14	—	—
Carburetted hydrogen	1.4	3.7	5.7
Azotic gas	1.53	1.56	4.1
Hydrogen	1.61	1.56	4.6
Carbonic oxyd	2.01	1.56	6.2

TABLE II.—Gases combining with Water in large Proportion.

One Measure of pure Water	absorbs, according to				
	Dalton.	Saussure.	Thomson.	Gay Lussac.	Davy.
Chlorine	2	—	—	—	—
Cyanogen	—	—	—	4½	—
Sulphureous acid	—	43.78	33	—	—
Fluosilicic acid	—	363+	—	—	—
Muriatic acid	—	—	516	—	—
Fluoboric acid	—	—	—	—	700
Ammoniacal gas	—	—	780	—	—

Combination of Gases with Solids.—The simple gases are only four, oxygen, chlorine, hydrogen, and azote. Oxygen

combines with all the simple bodies known. Chlorine, with by far the greater number. Hydrogen, with carbon, phosphorus, and sulphur, and some of the metals. Azote, as far as is known, with carbon only.

Of the union of compound gases with solids little is known, and such combinations are very rare.

With respect to the weights of the atoms, specific gravities, composition, &c. of the different gaseous bodies that have been well ascertained, they will be found in the titles appended to the article *Atomic Theory*, to which, therefore, we refer our readers. Other particulars, such as their chemical properties, &c. will be found under their respective heads.

Expansion of Gases by Heat. (See EXPANSION).—To what has been there advanced we may add, that it is now considered as established, that all elastic fluids expand equally and uniformly by heat; and the following table gives us nearly the bulk of a given quantity of air at all temperatures, from 32° to 212°, by the aid of which the expansion of gases for all other temperatures may be easily ascertained.

Temp.	Bulk.	Temp.	Bulk.	Temp.	Bulk.
32°	1000000	59°	1056249	86°	1112499
33	1002083	60	1058333	87	1114583
34	1004166	61	1060416	88	1116666
35	1006249	62	1062499	89	1118749
36	1008333	63	1064583	90	1120833
37	1010416	64	1066666	91	1122916
38	1012499	65	1068749	92	1124999
39	1014583	66	1070833	93	1127083
40	1016666	67	1072916	94	1129166
41	1018749	68	1074999	95	1131249
42	1020833	69	1077083	96	1133333
43	1022916	70	1079166	97	1135416
44	1024759	71	1081249	98	1137499
45	1027083	72	1083333	99	1139583
46	1029166	73	1085416	100	1141666
47	1031249	74	1087499	110	1162499
48	1033333	75	1089383	120	1183333
49	1035416	76	1091666	130	1204166
50	1037499	77	1093749	140	1224999
51	1039583	78	1095833	150	1245833
52	1041666	79	1097916	160	1266666
53	1043749	80	1099999	170	1287499
54	1045833	81	1102083	180	1308333
55	1047916	82	1104166	190	1329166
56	1049999	83	1106249	200	1349999
57	1052083	84	1108333	210	1370833
58	1054166	85	1110416	212	1374999

GASOMETER. See LABORATORY.

GASTRIC JUICE. See DIGESTION.

GASTROLOBIUM, in *Botany*, Br. in Ait. Hort. Kew. v. 3. 16, a papilionaceous genus, with ten separate stamens, named from the tumid, or *bellying legume*. We have had no opportunity of examining it.

GATES, l. 4, r. 5965 and 2790.

GATTON, l. 3, for 112 r. 99.

GAZANIA, in *Botany*, perhaps from *γάζα, riches*, in allusion to the splendour of the flowers.—Gertn. v. 2. 45 t. 173. Br. in Ait. Hort. Kew. v. 5. 140. Lam. Illustr. t. 702.—Class and order, *Syngenesia Polyg.-frustranea*. Nat. Ord. *Compositæ*.

Eff. Ch. Receptacle without scales. Seeds very hairy. Seed-down of chaffy hairs. Calyx of one leaf.

G. rigens, (*Gorteria rigens*; Linn. Sp. Pl. 1284. Curt. Mag. t. 90.); *G. pavonia*, (*Gorteria pavonia*; Andr. Repof. t. 523.); and *G. subulata*, Br. are the only species; all natives of the Cape of Good Hope. See *GORTERIA*.

GEAUGA, in *Geography*, a county of Ohio, containing 8 towns, and 2017 inhabitants.

GEDDINGTON, l. ult. This parish consists of 141 houses—r. 651.

GELATINE, in *Chemistry*. This animal principle has been lately analysed by Gay Lussac and Thenard, according to whom it consists of

Hydrogen	-	7.914
Carbon	-	47.881
Oxygen	-	27.207
Azote	-	16.998

100.

Gelatine does not exist in the blood, nor in any known animal fluid ready formed, but appears to be produced by the action of boiling. See *BLOOD*.

GELONIUM, in *Botany*, Roxb. in Willd. Sp. Pl. v. 4. 831. Ait. Hort. Kew. v. 5. 406.—Clafs and order, *Dioecia Icosandria*. Nat. Ord.

Eff. Ch. Male, Calyx of five leaves. Cor. none. Stam. twelve or more. Female, Cal. and Cor. like the male. Styles none. Stigmas three, jagged. Capfule of three cells, three valves, with three seeds.

1. *G. bifarium*. Willd. n. 1. Ait. n. 1.—Leaves elliptical, rather acute.

2. *G. lanceolatum*. Willd. n. 2.—Leaves oblong-lanceolate, obtuse.—East Indian trees, with alternate leaves, the tubular stipula of a *Ficus*, and axillary flowers.

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GENESEE, l. 5, r. 1810, and 12,588 perfons.

GENEVA, NEW, a township of Fayette county, in Pennsylvania, having 232 inhabitants.

GENEVIEVE, l. 7, add—and district. In 1810, it contained 4620 inhabitants, of whom 988 were slaves. This town is famous for its lead-mines, which occupy an extent of country, commencing about 30 miles W. of the Mississippi, and extending W. and N.W. It was the discovery of these lead-mines that gave rise to the famous Mississippi scheme, projected by Law in 1719, which ruined hundreds of families in France, as they were then supposed to be a silver-mine: and though the bubble burst immediately, yet Du Pratz, who wrote thirty-nine years afterwards, persisted in the error, and speaks of a silver-mine on the Marameg in his account of Louisiana. The Marameg is now called the Marrawal, on a branch of which, called the Negro-Fork, the mines of St. Genevieve are situated. These mines have been worked since about the year 1725, and they belong to a number of proprietors mostly held by grants from the Spanish governors, formerly residing about St. Louis. Bradbury's Travels, &c.

GEODORUM, in *Botany*, from *gea*, the earth, and *dora*, a gift, because, contrary to the nature of most of its nearest allies, this genus grows on the ground, not on trees.—Jackson in Andr. Repof. 626. Br. in Ait. Hort. Kew. v. 5. 207.—Clafs and order, *Cynandria Monandria*. Nat. Ord. *Orchideæ*.

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Eff. Ch. Lip hooded, fessile, not articulated with the column. Calyx and petals uniform, spreading, rather ascending. Anther a terminal deciduous lid. Masses of pollen two, each with a posterior lobe.

G. purpureum, (*Limodorum nutans*; Roxb. Corom. v. 1. t. 40. Malaxis nutans; Willd. Sp. Pl. v. 4. 93.); *G. citrinum*; Andr. t. 626; and *G. dilatatum*, (*L. recurvum*; Roxb. t. 39.); all East Indian plants, are the only described species. Their leaves are elliptical, many-ribbed; clusters or spikes on radical stalks, pendulous, handsome.

GEOLOGY. (See *GEOLOGY*.) At the period when that article was written, geology as a science had scarcely excited any considerable degree of interest in this country; and those who were desirous of acquiring a knowledge of the structure of the earth directed their attention more to the exposition of it which Werner had given, than to the actual state of the earth itself. Indeed such was the supposed infallibility of the German professor, and the attachment to theory, that for several years the researches of geologists were undertaken chiefly to make facts coincide with preconceived systems; but in proportion as our knowledge of facts extended, the difficulty of reconciling them with received theories became more and more apparent, and some of the warmest advocates of these theories began to perceive the necessity of describing phenomena as they really exist, without any further attempt to bind nature in the fetters of an artificial system.

The system of Werner (see *SYSTEMS of Geology*) pretumes, that all the principal beds of rock, or rock formations, are universal, or, in other words, that each of these rocks encircles the whole earth, like the rind of an onion, and that they are placed over each other in a regular succession, which is the same in every part of the globe. This regular succession is a necessary consequence of another position in the Wernerian system, that the materials of all the different beds of rock were held in solution by water, which covered the globe universally, and at successive periods deposited its contents as the waters retired; hence the *retiring of the waters* is an important part of the system, and is often referred to in some of the articles relating to geology, in the early volumes of the Cyclopædia. Had the strata been deposited from water covering the whole globe, their order of succession in each country would doubtless be the same; but this is not confirmed by experience. The strata are not universal formations, but are of limited extent, and vary much in different parts of the world, and even in different districts of the same country. See *ROCKS* and *STRATA*.

Some of the universal formations of Werner occur only in one place, as the topaz rock. The absurdity of describing this rock among such universal formations is so manifestly absurd, that it is astonishing such an arrangement could ever have been admitted. To explain the difference in the order of succession observed in different countries, the German geologist had recourse to what were called *subordinate formations*. These are strata of different kinds, which, it was admitted, might occur in other rocks without any regular order of succession.

By this admission, all variations from the order of succession of rock formations laid down by Werner were supposed to be accounted for. The strata which were not arranged in the Wernerian order were called *subordinate formations*; by such a verbal device, geologists thought they could reconcile to their theory all opposing facts. Mr. Bakewell, in his Introduction to Geology, was, we believe, the first person in this country who ventured publicly to state that many of the supposed universal formations of Werner were local, but of greater or less extent, and that the same regular order of succession was not universal in different countries.

GEOLOGY.

This, we believe, is now admitted by all those who have had the most extensive range of observation.

"The secondary strata are local formations, and some of the upper strata were evidently formed in detached lakes or inland seas. A still more comprehensive view will prove that even all the stratified rocks above the red sand-stone and alpine lime-stone are also local formations, which had their origin in detached hollows or seas of great extent, but which were limited to certain portions of the globe. The observation of travellers in different parts of the world incontrovertibly prove that these formations are local. I am even inclined to consider the red sand-stone and alpine lime-stone as local formations, but of greater extent than any of the strata above them. If this view of the subject were admitted, geologists would be relieved from the great difficulties under which the science labours at present, and it would go far to establish a simple and perspicuous system, which will at once account both for the similarity and diversity of rock formations in various parts of the world. If the mountains were once much higher than at present, it must be admitted, that before the formation of the secondary strata the valleys and hollows were deeper in a far greater proportion, because to the height of the surrounding mountains we must add the whole depth of the secondary strata which were then wanting. By whatever process the secondary strata were formed, the existence of organic remains in them incontrovertibly proves that they were deposited in succession, and the regular manner in which they are spread over each other further proves that the greater part of them were deposited in a fluid medium. As there are incontrovertible proofs that water once covered nearly all the existing continents, it follows, that when the ocean retired, or, which is the same thing in effect, when the dry land emerged from the sea, vast inland lakes or seas would be left at the bottom, of which the secondary strata were formed. As the sea retired further, the higher grounds being left dry, these inland seas or lakes would become contracted, and a number of smaller lakes would occupy the lowest cavities and depressions, in each of which separate depositions of strata might take place. The lower strata would be the most widely spread, and the upper would constitute detached or insulated formations of greater or less extent, in which there might be a great similarity in some situations, and a great diversity in others. Now such is found to be the fact." (Bakewell's Introduction to Geology, 2d ed. chap. x.) This view of the subject, we think, receives much support from the position of the mountain ranges in Europe, as may be seen in Mr. Arrowsmith's excellent map, in which the physical geography is distinctly marked. These ranges form the borders of numerous basins, which must evidently have once been the boundaries of inland seas when the ocean retired from the present continents.

Though great diversity may prevail in the succession of the strata in different parts of the world, yet there are certain rock formations that we may regard as universal, without asserting that they were formed at the same epoch in very distant countries; for it is only where organic remains of the same species occur in rocks that we may infer that their formation was cotemporaneous. In the present state of our information, we may regard granite as the lowest and most extensive rock, forming the foundation of all other rocks or strata, where we have opportunities of tracing their succession. With granite we include gneiss, and also mica-slate, which may be regarded as granite in a schistose form, but with one or other of the ingredients nearly wanting, or occurring in a very small proportion. (See ROCKS, GRANITE, GNEISS, and MICA-SLATE.)

Clay-slate (see SLATE) generally covers the granite, gneiss, or mica-slate, and may be regarded as a universal formation, or, perhaps more correctly, as a general covering of granite, gneiss, and mica-slate. The slate formation contains various anomalous beds of porphyry, compact felspar, lime-stone, hornblende, serpentine, and sienite. (See PORPHYRY, FELSPAR, &c.) No observable regularity has yet been discovered in the succession of these latter rocks in different countries, and some of them may often be observed passing by gradation into each other. They have generally a crystalline structure in the vicinity of granite (see ROCKS), and have not been observed to contain organic remains.

The beds of rock which cover slate appear, many of them, to be a coarser kind of slate, with an intermixture of quartz, or other minerals, until at last they lose the character of slate, and become sand-stone. This coarse slate, in its passage from slate to sand-stone, forms that kind of rock which has been denominated grey wacke or waccé. Various beds of lime-stone occur in the coarser slate. Of these, the most considerable in England is called the mountain lime-stone: it has a subcrystalline structure; it abounds in organic remains in many parts, and contains metalliferous veins, principally of lead and zinc. This lime-stone lies below all the principal coal formations in England and Wales. (See STRATA.) Between this lime-stone, and a dark grey compact lime-stone called lias, occur the coal strata, with the various beds of sand-stone and shale. The order of succession of these beds is not similar in different districts. The lias stratum is the most remarkable in England, both for its regularity and extent, and the organic remains which it contains. The same stratum occurs in Flanders. The strata above the lias were first correctly described by Mr. Farey, whose account we have given in the article STRATA. (See STRATA.) The strata above the lias occur with remarkable regularity over a great part of the eastern side of England, described by Mr. Bakewell, in his Geology, as the 'low district,' extending in a waving line from Dorsetshire to the county of Durham, and delineated in his map. These strata consist of a succession of beds of roe-stone, or oolite, (see ROE-STONE,) and coarse lime-stone, with thick beds of sand and clay, over which occurs the chalk. These beds are arranged with great regularity compared with the beds that occur between the lias and the mountain lime-stone; but the order of succession and thickness, particularly of the oolite, is variable; for in many parts, beds of vast thickness occur which are not found in other situations, and in some situations the oolite is entirely wanting, and the green sand, instead of covering it, rests immediately on the lias. See Mr. Bakewell's section of the strata, *Plate III. fig. 2. Geology.*

A tabular arrangement of the strata of England, given by Mr. Buckland, professor of mineralogy at Oxford, has recently been published, which we shall present to our readers. At the same time we must observe, that they would be greatly mistaken were they to suppose that the whole of these rock formations had ever been observed in any one situation in England or elsewhere, or that the strata preserve the thickness here given throughout their whole extent. There is no part of England, we believe, in which all the strata here enumerated could be found, were it possible to perforate through them. The table may be regarded as an approximation to the true order of succession whenever several of these formations occur in the same district, and the localities annexed will make it both interesting and useful. Persons who study nature in their closets are disposed to believe, that the thickness of the strata

strata between the chalk near London, and the granite of Devonshire, is much greater than what it really is, taking it for granted that the dip of the strata is always regularly to the east; but this is not the case. A stratum of any considerable extent has waves and irregularities, by which it is generally spread over a large space compared with its true thickness and supposed angle of inclination. A stratum not more than twenty yards in thickness may extend in the line of its dip ten miles or more, and may appear to have a considerable dip when observed in certain situations; and were we to calculate its thickness from the extent of ground which it covers, and from the dip, we might infer that it exceeded two thousand yards or more. More accurate observations will convince us, that the numerous fractures or bendings of the strata in the line of their dip generally spread them over a much wider space than the angle of inclination and thickness would lead us to believe; and the comparison which has been made of sliding a number of books under each other to represent the supposed thickness of the whole strata of England is utterly inapplicable to the case. In sections of particular districts, to represent the arrangement and dip of the strata, it is impossible to delineate the irregularities and wavings of the strata on a small scale. In the section of England by Mr. Bakewell, (see *Plate III. fig. 1. Geology*), the various strata from the German ocean to Cross-fell are represented rising regularly from under each other, like a number of books in a slanting position, it being impracticable to represent on such a small scale all the irregularities of each stratum. In *Plate III. fig. 2.* the section is on a larger scale, and the lias stratum, *d, d, d, d,* is represented rising from under the green sand *b, b, b,* near Bridport in Dorsetshire, and continued to the valley, *M,* at Axmouth; whereas had not the strata been dislocated by a great number of fractures, as represented in the section, the lias stratum *d* would have terminated or cropped out east of the letter *L*, which represents the situation of the town of Lyme. The aggregate thickness of all the beds of lias cannot be more than two hundred yards, and the regular inclination is at least one yard in twenty, which would make the lowest bed of lias crop out about four thousand yards, or two miles and a quarter west of its first appearance near Bridport.

Plate III. fig. 6. Geology, represents the waving structure of the beds of slate, provincially called shillet in Devonshire. In some situations, as near Moreton, beds of black lime-stone are interposed, and take the twisted form of the slate. Now in passing from Exeter to Dartmoor over the fractured edges of the strata, as represented *fig. 6.* the traveller may cross portions of the same stratum *a, a, a,* repeatedly at a considerable distance from each other, and were he to suppose each of these portions to be a separate stratum, and to calculate accordingly, the thickness of the whole bed of slate, from the red ground on the east, to Dartmoor on the west, he would make it not less than ten miles; whereas in all probability it may not exceed three or four hundred yards. On a smaller scale, the strata are often extended over a large space by fractures in many of the coal districts; by which a bed of coal is brought near the surface several times in the line of its dip, as represented *Plate I. fig. 1. Geology*, and described in the article *COAL.* See *COAL*, and *VEINS, Mineral.*

It too frequently happens, that geological observers measure nature by the standard of their own limited experience in passing through a country, and describe certain rock formations as destitute of organic remains, because they have not found them in travelling through a district. The alpine part of Westmoreland and Cumberland near

the lakes consists of grey wacke, clay-slate, compact felspar, porphyry, sienite, trap, clinkstone, and granite; a thin bed of stratified lime-stone is interposed, and runs through a space of fifteen miles, containing organic remains of coralloids, though the rocks which cover this lime-stone, to a great depth, and the rocks on which it rests, contain no observable vestiges of organic life. Their relative position in the valley of Long Sleddale in Westmoreland, is represented *Plate III. fig. 5. Geology.* The slate which covers the lime-stone appears to dip at an angle of seventy degrees; but on more attentive examination it will be found, that what might be mistaken for regular strata are merely the schistose laminae of the slate arranged in the direction of the cleavage, the dip of the slate being in reality the same as that of the lime-stone on which it rests. Under the lime-stone occurs a bed of horn-stone, resembling compact felspar, but infusible; this is eighty yards thick, and rests on other beds of schist, as represented *Plate III. fig. 5. Geology.* This schist and horn-stone contain no organic remains, and appear to be connected with the granite, which makes its appearance in the adjacent valley at no great distance. The discovery of organic remains under rock formations of great extent which are destitute of them is a circumstance of great interest to the geologist wherever it occurs, and proves the necessity of caution in deciding whether certain rocks were formed prior to the existence of organic beings. Basaltic or trap rocks, whose situation is not conformable with the general dip or position of the strata, and which bear a near similarity to volcanic rocks in appearance and composition, are described under the articles *TRAP*, *ROWLEY-RAGG*, *WHINSTONE*, and *VEINS, Mineral*; and also the article *BASALT, Addenda*; which see. *Plate IV. fig. 2. Geology*, represents the arrangement of a series of columnar and amorphous beds of basalt placed over regular strata in an unconformable position, and intersected by veins or dykes of basalt *b b*, in which the structure is columnar; but the columns or basaltic prisms in these dykes are arranged horizontally.

Fig. 4. represents a basaltic rock on the coast of the county of Antrim, which incloses a bed of chalk that it appears to have broken and enveloped; an effect which seems to require that the basalt should once have been in a melted state like lava. The basalt is represented in the *fig.* immediately beneath the above, as it occurs in veins in another situation on the same coast, cutting through the chalk, and changing it to a certain distance into crystalline lime-stone or marble. See *TRAP* and *WHINSTONE.*

Plate IV. fig. 1. Geology, represents the section of a regular metallic vein, which divides into two, and meets again, leaving an intervening space, filled with earthy minerals called rider. The vein is represented as separated from the rock by a thin lining of clay *c c*, which generally accompanies veins. The intersection of metallic veins in the same plate represents two veins containing the same kind of ore, and having the same dip as *a, a, a, a,* intersected by a vein of a different kind *b b*, which has cut through and displaced the former; in these instances, the vein *bb* is supposed to be of posterior formation to the veins *a, a, a, a.* In the same *fig.* is shewn the displacement of a vein without any intersection of other veins. (See *VEINS, Metallic.*) For an account of volcanic rocks, see the articles *VOLCANO* and *VOLCANIC PRODUCTS*, and also *SYSTEMS of Geology.* For an account of the organic remains in rocks, see *PETRIECTIONS, ROCKS, STRATA*, and *FLETZ ROCKS.* For an account of the organic remains of extinct species of large quadrupeds in alluvial soil, see *MAMMOTH, MASTODON, MEGALONIX*, and *MEGATHERIUM, Addenda.*

GEOLOGY.

A Tabular Arrangement of all the Rock Formations in England.

CLASS I.—Primary Rocks.

Granitic Formation.

N ^o 1. Granite Gneiss Mica-slate Quartz-rock Marble Trap Serpentine Porphyry Sienite	}	Order of succession variable; thickness unknown.
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CLASS II.—Transition Rocks.

Grey Wacke Formation.

N ^o 2. Lime-stone Trap Porphyry Grey wacke-slate Grey wacke	}	Order of succession variable; thickness unknown.
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CLASS III.—Secondary Fletz Rocks.

Structure usually stratified, but the Strata much dislocated and inclined.

N ^o 3-	Localities.	Greatest observed thickness of the strata.	
		Feet.	
Old red sand-stone First sand-stone Mountain, or metalliferous lime-stone Mill-stone grit Principal coal measures	Red, often micaceous sand or sand-stone, containing subordinatedly conglomerate pebbles from the older rocks Calcareous concretions in beds and inflated masses Porphyry and trap in beds and masses Often a compact coralline marble, alternating with beds of shale, chert, grit-stone, and trap Coarse siliceous sand-stone, with pebbles of white quartz	Van Mountain, Brecon - - 2000 Heavytree, Exeter Thoverton, near Exeter Derbyshire, four beds, and three of trap } 1782 Crofs-fell, 19 of lime-stone, 50 of grit-stone, 60 of shale } 2749 Yorkshire, and Derbyshire - - 260 Newcastle, 82 beds of grit-stone, shale, and coal, of which nine of coal are wrought } 1482	
	Strata often lie horizontally on the Edges of the inclined Beds of the last Formation.		
	N ^o 4. Second sand-stone, or grand gypsum, and salt formation	Magnesian lime-stone New red sand-stone, second sand-stone of Werner	Yellowish, fine-grained, and sometimes of a pink hue Fine-grained, red siliceous, sometimes with pebbles of quartz, and alternating with red marl, containing salt and gypsum Knaresborough, Boffover, and Sunderland } 300 Salop, Lancashire, Staffordshire, Devon, Cambridge, Plains of Cheshire, and Worstershire } 400

		Localities.	Greatest observed distance of the strata.	Feet.
N ^o 7.				
Chalk formation	Chalk, marl, malm, or grey chalk	{ Without flint or chert, passing into grey sand Into grey clay	{ Benfon, Oxon, Wiltshire, and Lewes, Suffex Folkstone	{ 200
	Lower chalk	{ With few flints sometimes hard	{ Warmminster, Wilts, and Flam-borough-Head, Yorkshire	{ 300
	Upper chalk	{ With many flints, passing into the former, soft enough to mark with	{ Salisbury Plain, and Downs of Suffex	{ 300
N ^o 8.				
Formations above chalk	Plastic clay	{ Potters' clay, alternating with beds of sand and gravel	{ Blackheath, Reading, Alum-Bay, Isle of Wight	{ 1131
	London clay	{ Lead, coloured with septaria, containing calcareous matter	{ Isle of Sheppey, and Bognor Rocks	{ 550
	Fossils same as in the calcaire grossiere of Paris	{ - - - - -	{ Hardwell-Cliff, near Christ-Church, Hants	
	Lower fresh-water beds	{ Sandy argillaceous lime-stone, contains fresh-water shells	{ Headen Hill, Isle of White	{ 63
	Upper marine beds	{ Clay-marle, with marine shells	{ Ditto	{ 36
Upper fresh-water beds	{ Yellow argillaceous lime-stone, with clay-sand and fresh-water shells	{ Ditto	{ 1222	
N ^o 9.				
Trap	Fletz trap	{ Basalt wacke, amygdaloid green-stone	{ Giants' Caulfeway	{ 1040
N ^o 10.				
Alluvium	Deluvian detritus	{ Fragments of neighbouring and distant rocks, and with bones not mineralized	{ Generally in valleys	
	Fluviatile detritus	{ Post deluvian, accumulations of mud, sand, and salt Gravel, sand, and mud	{ Deltas of great rivers Channels of torrents and rapid currents	

In the preceding part of the present article we have stated, that this arrangement of the strata may be taken as an approximation to the truth with certain limitations. It must be observed also, that the trap rocks, N^o 9, most frequently occur covering or between many of the lower secondary rocks, precisely similar to what would have been the case had they been formed like volcanic rocks at different and distant epochs. The occurrence of basalt in or over chalk, or any of the formations above the lias, is extremely rare. See SYSTEMS of Geology.

GEORGE, ST., l. 15, add—The hundred of St. George's, in Delaware, contains 2880 inhabitants, of whom 314 are slaves.—Also, a town of Maine, in the county of Lincoln, having 1168 inhabitants.

GEORGE-Town, col. 2, l. 14, r. 1998; l. 29, add—Also, a district of North Carolina, containing 15,679 inhabitants, of whom 13,867 are slaves.

GEORGE, a township of Fayette county, in Pennsylvania, having 2086 inhabitants.

GEORGIA, in America, l. 2, r. 1760.

GERMAN, l. 2, r. 2079.

GERMAN-Town, col. 2, l. 1, r. Mason county, in Kentucky, containing 36, &c.; add—Also, a town of Ohio, in the county of Montgomery, having 1256 inhabitants.

GERRY, l. 3, r. 839.

GEYSERS, celebrated fountains situated on the side of a hill, about 16 miles to the N. of Skalholt; for an account of which we refer to the article UXAHVER.

GEZANGABEEN, or *Persian Manna*. This substance has been lately ascribed by Capt. E. Frederick, of the Bombay Establishment, to be the production of insects. It is obtained, according to the same gentleman, from a small shrub somewhat resembling the broom, on which the insects reside, by beating the bushes with a stick. When first separated, it is a white sticky substance, not unlike hoar frost, of a very rich sweet taste. It is purified by boiling, and then mixed up with rose-water, flour, and pistachio-nuts into cakes, and in this form constitutes the sweetmeat, called in Persia *gezangabeen*, and which by the Persians is highly valued. This substance, in its original state, is said to liquify at a temperature of about 68°. The Persians, however, themselves consider this substance as a spontaneous exudation from the tree on which it is found; hence the term *gezangabeen*, a term meaning literally *juice of the gez*, which is the Persian name of the tree producing it. Thomson's Annals of Philology, vol. xiii. See MANNA.

GHAUT. See GAUT.

GHONI, a large market-town of Mingrelia, carrying on some trade, situated between the Arafcha and the Hippas.

GHURZI, a well-built and populous town of Mingrelia, on the left bank of the Taghuri.

GILBERT, col. 2, l. 32, r. 1759.

GILDER, or GUILDER. See FLORIN.

GILEAD, in *Geography*, a town of Maine, in the county of Oxford, having 215 inhabitants.

GILES, a county of Virginia, containing 3475 persons, of whom 242 are slaves.

GILL, l. 4, r. 762.

GILLINGHAM, l. 4 and 5, r. 875, and 5135.

GILMANTOWN, l. 4, r. 4338.

GILSON, or GILSUM, l. 2, r. 513.

GIRARDEAU, CAPE, a district of Louisiana, containing 3888 inhabitants, of whom 589 are slaves.

GIRVAN, l. *penult.* and *ult.*—In 1811, the number of houses was 533, and of inhabitants 3097, of whom 358, &c.

GISBOROUGH, or GUIBOROUGH, l. 5, r. 1811—435; l. 12, r. 2094.

GLAMORGANSHIRE, last parag.—Glamorganshire is divided into ten hundreds, exclusive of the two towns of Cardiff and Swansea, and 118 parishes, which, in 1811, contained 85,067 inhabitants; 41,365 being males, and 43,702 females: of whom 7915 families were employed in trade and manufacture, and 8217 in agriculture.

GLANCE COAL. See MINERALOGY, *Addenda*.

GLASGOW, col. 2, l. 11 from the bottom, add—By the parliamentary returns of 1811, the city and burgh of Glasgow contained 17,543 houses, and 100,749 inhabitants; 45,275 being males, and 55,474 females: of whom 17,669 families were employed in trade and manufactures, and 544 in agriculture.

GLASS, *Laws relating to*, l. 14, add—By 49 Geo. III. c. 63, the former duties upon crown glass and broad glass were repealed, and new duties were imposed. This act also contains directions and regulations with regard to the construction and use of the annealing arch or oven.

GLASTONBURY, col. 2, l. 42, r. 1811—448; l. 43, r. 2337—121.

GLASTONBURY, in America, l. 2, r. 76; l. 5, r. 2766.

GLOUCESTER, col. 6, l. 6, r. 1811; l. 7, r. 1509—8280; *dele* the next paragraph, and insert—3726 being males, and 4554 females; of whom 1312 families were employed in trade and manufactures, and 12 families in agriculture.

GLOUCESTER, in America, l. 3, r. 5943; l. 21, r. 2319. Col. 2, l. 2, for Woodbury insert—Weymouth; l. 9, r. 19744; l. 10, r. 74; l. 17, after Philadelphia, add—having 555 inhabitants.—Also, a town of the same county, having 1726 inhabitants.—l. 25, r. 10,427 inhabitants, of whom 5978 were slaves in 1810.

GLOUCESTER, *New*, a town of Maine, in the county of Cumberland, having 1640 inhabitants.

GLOUCESTERSHIRE, col. 2, l. 26, insert after amounted to—52,042, of inhabitants 285,514, of whom 133,192 were males, and 152,322 females; 29,988 families being employed in trade and manufactures, and 20,782 in agriculture.

GLOVER, l. 3, r. 378.

GLUCINA, in *Chemistry*, the name of an earth. (See GLYCINE.) Dr. Thomson, from the experiments of Berzelius and others, estimates the weight of the atom of glucina at 22.5.

GLUCINUM, the metallic basis of *glucina*. When glucina was heated by sir H. Davy with potassium, that metal was converted into potash, and grey metallic particles were observed mixed with the potash, which when put into

water gradually evolved hydrogen gas, and were converted into glucina. This is all we know at present respecting this metal.

GLUTEN, supposed to be the active principle of yeast. See YEAST.

GLUTTON, r. *URSUS Gulo*.

GLYN, l. 4, r. 3417, of whom, in 1810, 2845 were slaves.

GLYPHIS, in *Botany*, from γλυφω, *to emboss*, expressing the appearance of the warty crust.—Achar. in Tr. of Linn. Soc. v. 12. 36. t. 2, 3.—A genus of crustaceous Lichens, of which four species are described and figured, found on the barks of different tropical trees. See CHONDROCTON.

Eff. Ch. Warts flatfish, of the substance of the crust. Receptacles superficial, numerous, irregular, black, solid, each with a depressed disk, and tumid margin.

The species are, *G. labyrinthica*, t. 2. f. 1. Ach. Syn. 107: *tricofa*, f. 2: *ciatricofa*, f. 3: *favulofa*, t. 3. f. 1.

GODALMING, l. 2, r. 672, and 3543.

GOFSTOWN, l. 5, r. 2000.

GOLD. See GOLD, and MINERALOGY, *Addenda*.

GOLD, in *Chemistry*. A few particulars lately ascertained respecting this metal deserve to be briefly noticed here.

Sulphur is stated in the Cyclopædia to exert no action on gold, and this is true in ordinary cases. But if an alkaline hydrofulphuret be dropped into a solution of gold, a black powder falls to the bottom, which is found to be a fulphuret of gold; and which, according to the experiments of Bucholz and Oberkampff, is composed of

	Bucholz.	Oberkampff.
Gold	-	100
Sulphur	-	24.39

With respect to the oxyds of gold, there are still very great confusion and uncertainty. According to Berzelius, who is one of the most recent experimentalists on gold, the purple oxyd is a compound of 100 gold + 12.077 oxygen; and the protoxyd of 100 gold + 4.026 oxygen. On this supposition, the weight of an atom of gold, as estimated by Dr. Thomson, will be 248.75, and this determination agrees tolerably well with Oberkampff's analysis of the fulphuret of gold above-mentioned. Still, however, these results are by no means satisfactory.

GOLDSINNY, r. *GOLDFINNY*.

GOMPHOSUS, in *Ichthyology*, a genus of fishes of the Thoracici order, instituted by count de Cèpe from the MSS. of Commerçon; the characters of which are, that the jaws are lengthened into a tubular snout, and that the teeth are small, those in front being larger. There are two species, both natives of the Indian seas, *viz.* *G. caruleus*, or *G.* entirely of a blue colour, about the size of a tench, with a blackish cast on the pectoral fins; body arched above, and in a greater degree beneath; snout about one-seventh of the whole fish; upper jaw larger than the lower; the sides of the mouth smooth and blue, head and gill-covers plain, the rest of the body covered with scales, the lateral line through its whole course marked with small streaks like Chinese characters: and *G. variegatus*, or variegated with red, yellow, and blue; a beautiful fish, observed by Commerçon about the coasts of Otaheite.

GOOCHLAND, l. 4, r. 10,203 inhabitants, of whom 5664 were slaves in 1810.

GOODYERA, in *Botany*, dedicated by Mr. Brown, to the worthy memory of Mr. John Goodyer, a Hampshire botanist, celebrated in various parts of Gerard's Herbal, (see ed. 2. 1018, 228, &c.)—Br. in Ait. Hort. Kew. v. 5.

197.—This genus founded on *Satyrium repens*, Linn. we have not as yet ventured to separate from NEOTTIA; see that article.

GORHAM, l. 4, r. 2632.

GOSHEN, in America, l. 4, r. 692; l. 7, containing 86 inhabitants; l. 8, r. 1273; l. 10, r. 1641. At the close, add—Also, a town of Cheshire county, in New Hampshire, having 563 inhabitants.—Also, a town of Lincoln county, in Georgia. See LINCOLN.—Also, a township of Columbian county, in Ohio, having 277 inhabitants.—Also, a town of Ohio, in Tuscarawa county, having 320 inhabitants.

GOSPURT, col. 2, l. 30, r. 1811—7788; l. 31, r. 1439.

GOSPURT, in America, l. 3, r. 72.

GOTHEBORG, col. 2, l. 5, r. amounted in 1811 to 24,858 persons, &c.

GOULDSBOROUGH. Add—the town contains 471 persons.

GRABS, the name of vessels peculiar to the Malabar coast, generally with two masts, and of 180 tons burthen, but sometimes with three masts, and about 300 tons burthen. They are so constructed as to draw little water, being very broad in proportion to their length, becoming narrow from the middle to the end, and having a prow projecting like that of a Mediterranean galley: others are constructed with a strong deck fixed with the main-deck of the vessel, from which, however, it is separated by a bulk-head that terminates the fore-castle; on the main-deck under the fore-castle are mounted two pieces of cannon, of nine or twelve pounders; the cannon of the broad-side are from six to nine pounders.

GRAFTON, l. 4, r. 1365; l. 8, r. 35; l. 9, r. 28,462; l. 12, r. 931; l. 18, r. 946.

GRAIN, as a weight, l. 11, de bread.

GRAINS of *Paradise*. See AMOMUM and CARDAMOM.

GRAINGER, l. 6, r. 6397 and 537.

GRAMPOUND, l. *penult.* r. 601 and 96.

GRANBY, l. 5, r. 850; l. 8, r. 2696.

GRAND ISLE. Add—It contains 3445 inhabitants by the census of 1810.

GRAND Junction Canal, l. 16 from bottom, for began r. begun.

GRAND View, a township of Ohio, in Washington county, having 463 inhabitants.

GRANLEY, a township of Effex county, in Vermont, having 120 inhabitants.

GRANTHAM. In 1811, the borough and parish contained 673 houses, and 3646 persons; viz. 1677 males, and 1969 females: 61 families being employed in agriculture, and 430 in trade and manufactures.

GRANVILLE, l. 2, r. 15576; l. 3, r. 7746; l. 9, r. 1504.

GRANVILLE, a township of Licking, in Ohio, having 674 inhabitants.

GRAPHITE. See PLUMBAGO, and MINERALOGY, *Addenda*.

GRAVESEND, col. 2, l. 3, r. 3119; l. 4, r. 525.

GRAY, l. 3, r. 1310.

GRAYSON, l. 2, r. 4941 inhabitants, of whom 270 were slaves in 1810; add—Also, a county of Kentucky, containing 2301 inhabitants, of whom 103 were slaves in 1800.

GREEN, l. 6, r. 19,536 inhabitants, of whom 367 were slaves; l. 10, r. 12,544; l. 14, r. 6603, of whom 1354 were slaves; l. 16, r. 4567 and 1842; l. 19, r. 1277; l. 23, r. 1497; l. 24, for Franklin county, add—Also, a

township in Washington, r. GREEN, adding after slate—with 1708 inhabitants; then add—Also, a township of Ohio, in Fayette county, with 290 inhabitants.—In Gallia county, with 421.—In Hamilton county, with 916.—In Jefferson county, with 875.—In Ross county, with 1183.—In Scioto county, with 507.—In Trumbull, with 559.—In Columbiana county, with 338 inhabitants; all in the district of Ohio.

GREEN Briar, l. 4, r. 5914 inhabitants, of whom 494 were slaves in 1810.

GREEN Earth. See MINERALOGY, *Addenda*.

GREENE, l. 2, r. 9713 and 655; l. 7, containing, together with Greenborough town, 11,769 inhabitants, the county having 4992, and the town 244 slaves, included in the above number; l. 12.—By the census of 1810, it contains six townships, and 5870 persons.

GREENE, in Pennsylvania. See GREEN.

GREENE, in Maine. See GREEN.

GREENE, a town of Adams' county, in Ohio, having 393 inhabitants.

GREENFIELD, l. 5, r. 1165; l. 7, r. 980; add—Also, a township of Bedford county, in Pennsylvania, having 855 inhabitants.—Also, a township of Ohio, in Fairfield county, having 743 inhabitants.

GREENLAND, in America, l. 3, r. 592.

GREENLAW, col. 2, l. 2, r. In 1811, it contained 253 houses, and 1260 inhabitants.

GREENOCK, l. 3, after Glasgow, add—The parish, including East, Middle, and West Greenock, contained, in 1811, 1138 houses, and 19,042 persons.

GREENSBOROUGH, in Georgia. See GREEN; l. 6, r. 566.

GREENSBURGH. Add—It contains 132 inhabitants, including 47 slaves.

GREEN-STONE, in *Geology, grunstein*, Werner, a species of granular trap or basalt, composed of hornblende and felspar, and described in our article TRAP. (See TRAP.) It has recently been discovered, that the mineral called augit, or pyroxene by Haiüy, is a constituent part of many rocks of green-stone, which confirms still further the similarity between volcanic and basaltic rocks. See VOLCANIC *Produdis*.

GREENSVILLE, l. 4, r. 6853 inhabitants, of whom 4599 were slaves in 1810.

GREENVILLE, l. 3, r. 13,133 and 2353.

GREENUP, a county of Kentucky, containing 2369 persons, of whom 484 were slaves in 1810.

GREENWICH, col. 4, l. 28 from bottom, r. 16,947 and 2315.

GREENWICH, in America, l. 3, r. 1225; l. 6, add—containing 2858 persons; l. 9, in 1810, 2528; l. 13, add—in 1810, 858 inhabitants; l. 12, r. 3533. Add—Also, a township in Berks county, in Pennsylvania, having 1104 inhabitants.

GREENWICH, *East*, l. 3, r. 1530.

GREENWICH, *West*, a township in the same county and state, containing 1619 inhabitants.

GREENWOOD, l. 1, r. Northumberland; l. 2, r. 1028; add—Also, a township in Cumberland county, having 1102 inhabitants.

GREGORY, DAVID, l. *ult.* It appears by the inscription on his monument in St. Mary's church, Oxford, that he died Oct. 10, A.D. 1708; and not, as the writer of his life in the Biog. Brit. says, in 1710, whence this date is cited. He died at an inn at Maidenhead, in his way to London from Bath, and was buried in this town.

GRENATITE. See MINERALOGY, *Addenda*.

GREY *Antimony Ore.* See MINERALOGY, *Addenda.*

GRIESBACH, JOHN JACOB, in *Biography*, an eminently learned divine of Germany, was born in 1745, in Hesse-Darmstadt; and at the Gymnasium at Frankfort, and the university of Tubingen, acquired that acquaintance with the learned languages, for which he was so distinguished, and which he applied to the most valuable biblical purposes. He sought further means and opportunities for improvement at Halle and Leipsic. In order to acquaint himself with the variety of religious sects, and for the purpose of consulting public libraries, he commenced in 1769 an extensive tour, visiting Holland, England, and Paris. In 1770 he returned to Frankfort, with a view of arranging the stores which he had collected. In 1773 he was appointed professor extraordinary of divinity at Halle; and in 1774-1775 appeared his first great work, which was a critical edition of the historical books of the New Testament in Greek. From Halle he removed to Jena in 1775, and became third professor of divinity. Having previously published several critical dissertations in reference to biblical subjects, he completed, in 1777, his edition of the whole Greek Testament in 2 vols. As his reputation increased, his appointments and labours multiplied. But the great object to which his attention was principally devoted, was the completion of his edition of the New Testament, which appeared in 1803, 4, 6, and 7, in 4 vols. A larger edition, begun in 1796 and finished in 1806, was adapted for sale in England as well as in Germany; and was liberally encouraged by the munificence of the late duke of Grafton. In 1811 professor Griesbach's health began to decline, and in 1812 he was under a necessity of giving up the province of lecturing; and a disorder in the chest terminated his life on the 24th of March 1812, in the 68th year of his age. His corporeal form was athletic, his aspect grave and somewhat austere; but he possessed a kind heart, excellent moral principles, an independent spirit, and universal philanthropy. *Gen. Biog.*

GRIMSBY, l. 19 from bottom, after Grimby insert—(both borough and parish); l. 18, r. 619 and 2747.

GROGGINESS, in *Farrery*, a stiffness in the foot of a horse occasioned by battering the hoof on hard ground, which is often succeeded by swelling of the leg and contraction of the sinews. A horse that bears altogether upon his heels in trotting is denominated "groggy;" and the defect is generally incurable.

GROTON, l. 3, r. 549; l. 6, r. 449; l. 8, r. 1886; l. 11, r. 4451.

GROTTO, col. 2, l. 36. Add—The grotto in Savoy is a prodigious work, said to have been begun by Cæsar, but principally executed by Charles II. duke of Savoy in 1760. It is a passage cut through the mountain near the delightful valley of Echelles to the length of 5000 yards, and in perpendicular height above 100 feet; it is wide enough for two carriages to pass. About half way is a complete tunnel, running in another direction, 1000 feet long, and 36 feet high, cut by order of Buonaparte for the conveyance of cattle. Six years, both night and day, were devoted to the completion of it.

GRYLLUS. Under genus GRYLLUS, species CRYS-TATUS, add—See LOCUST and ACRIDOPHAGI.

GUADALAJARA, col. 2, l. 3, after annually, add—The population is estimated at 75,000, but according to Humboldt 190,500 in 1803, and that of the administration 5,630,500. N. lat. 20° 50'. W. long. 105°.

GUAIAACUM, *Chemical Properties of.* Guaiacum was

formerly considered as a resin, though in its properties it differs considerably from resins. Guaiacum always assumes a green colour when exposed to the light in the open air. When heated, it melts and diffuses at the same time rather a fragrant odour. Its sp. gr. is 1.2289. It is very sparingly soluble in water, but imparts to that fluid a greenish-brown colour, and a sweetish taste. Alcohol dissolves it with facility, and forms a deep brown coloured solution. Sulphuric ether also dissolves it, but not in such large proportions as alcohol. It is readily soluble in alkaline solutions. Most of the acids also act upon it with considerable energy; thus sulphuric acid dissolves it, and forms a deep red solution. Nitric acid dissolves it completely with effervescence, and when the solution is evaporated, it yields a very large proportion of oxalic acid, but no artificial tannin. Muriatic acid acts but slightly on guaiacum. When guaiacum is submitted to destructive distillation, it yields a little acidulous water, a considerable proportion of brown empyreumatic oil, some gaseous products, and a quantity of charcoal is left on the retort nearly equal to one-third of the original weight of the guaiacum.

GUANAJUATO, l. 2, r. Quaraçtaro, and between 21° 30' and 22° 30' N. lat., and 100° and 105° W. long., extending from N. to S. 75 miles, from E. to W. 85 miles. Humboldt estimates the population of the administration at 517,300, and of the capital, in N. lat. 21°. W. long. 105°, at 41,000.

GUANARA, at the end, r. Depons' &c.

GUAXACA, l. 5, after distance, add—between 16° and 18° N. lat., 98° and 112° W. long.; from E. to W. 230 miles, from N. to S. 175 miles.—l. 32, after persons—that of the province 534,800. At the close—W. long. 96° 25'.

GUERNSEY, a county of Ohio, containing 9 townships, and 3050 inhabitants.

GUGAH, a town of Scind, in the Persian empire, built at the foot of a hill, at the bottom of which runs a small creek in N. lat. 24° 45'. E. long. 68° 7', and containing 600 inhabitants.

GUILDER, or GILDER. See FLORIN.

GUILDFORD, last lines, r. 495 and 2974.

GUILDHALL, l. 3, r. 544.

GUILFORD, l. 2, r. 1961; l. 4, r. 1872.

GUM, *Chemical Properties of.* The best test for gum in solution, according to the experiments of Dr. Thomson, is silicated potash. When added to a very dilute solution of gum, it produces a white flaky precipitate. Gum arabic is composed, according to

	Gay Lussac and Thenard.	Berzelius.
Of Hydrogen	- - 6.93	- 6.788
Carbon	- - 42.23	- 41.906
Oxygen	- - 50.84	- 51.306
	100.	100.

The varieties of gum are very numerous, and probably differ considerably in their chemical properties, though few of them have been examined. (See CERASIN.) It has been remarked by Mr. Barrow, and probably also by others, that all trees which yield gum have an astringent bark.

GUNPOWDER, col. 2, l. 31 from the bottom, after 1326, add—or, as others say, 1354, (Watson's Chem. Eff. vol. i.)

GUN-SHOT WOUNDS. At the end, add—See WOUNDS.

GURIEL, r. a small country of Asia.

GURMSYL, or GURMESSER, meaning a warm climate, a district of Mekran, which is a narrow tract, about five

days' journey N.W. of Noosfley, probably the bed of a river, half a mile wide, between two high banks, fertile in grain, and being watered by the Heermund river, needs little cultivation. The inhabitants are notorious robbers, composed of the outcasts of the surrounding country.

GYMNADENIA, in *Botany*, Br. in Ait. Hort. Kew. v. 5. 191, (*Orchis conopsea* of Linneus, &c.), is separated from ORCHIS, (see that article,) merely because the glands supporting the pollen, are, as the name expresses, *naked*, or not enclosed in any hood; a character which appears to us not essential.

GYMNETRUS, in *Ichthyology*, a genus of the 'Thoracici order of fishes; the characters of which are, body very long, compressed; teeth numerous, fubulate; gill-membrane four or five rayed; and deltitute of anal-fin. The species are, *G. Ascanii*, or silvery *G.* speckled longitudinally with brown points. A native of the northern seas, and probably first described by Afcanius, in his "Icones rerum naturalium," and length ten feet, diameter about six inches; head

short, mouth small, and eyes rather large. This fish is said to be generally seen either preceding or accompanying the shoal of herrings in the northern seas, and therefore is particularly known by the appellation of "king of the herrings." Of this there is a variety, as Dr. Shaw suggests, called the Ruffelian Gymnetrus.

G. argenteo-ceruleococcus, or a blueish-silvery *G.* with oblique, linear, brown bands, and rounded spots, red fins, and four central processes. A native of the Indian seas, and occasionally seen in those of Europe.

G. cepedian is a doubtful species, of a gold colour, shaded with brown. See Shaw's *Zoology*, vol. iv. pt. ii.

GYMNIAS. Add—The site of Gymnias, according to Rennell's "Illustrations of the History of the Expedition of Cyrus, &c." was a town and village, named by others Camufour, and by others Coumbas and Kumakia, which stands on the northern bank of the river Erak, about 31 miles below its source, and on the eastern border of Persia, in the country of the Phasiani.

H.

HACKENSACK, in *Geography*, a town of Bergen county, in New Jersey, having 1918 inhabitants.

HACKNEY, l. 3 from the bottom, *r.* given by Mr. Decuyer. By the returns of 1811, the parish of St. John, Hackney, contains 2699 houses, and 16,771 inhabitants: but this, like the other villages in the neighbourhood of London, is daily increasing.

HADDAM, l. 3, *r.* 2205; l. 5, *r.* 2537.

HADDINGTON, l. 7, *r.* 1811—1671, and 4370.

HADDINGTONSHIRE, col. 2, l. 36, *r.* 1811—5882, and 31,164.

HADLEY, l. 4, *r.* 509—2592—1811.

HADLEY, l. 5, *r.* 1247.

HAIGH, l. ult. *r.* 1811—213—1118.

HAIR, *Chemical Properties of*. See INTEGUMENTS, and WOOL.

HALES-OWEN, in *Geography*. In 1811, the parish contained 1360 houses, and 6888 persons; 3451 being males, and 3437 females: 127 families employed in agriculture, and 1261 in trade, manufactures, and handicraft.

HALESWORTH, l. 4, for township *r.* parish; *r.* 342, and 1810.

HALIFAX, col. 2, l. 5 and 6, *r.* 1811—2151, and 9159; l. 3 from the bottom, *r.* 703; l. ult. *r.* 1758; after inhabitants, add—Also, a township of Dauphin county, in Pennsylvania, having 1365 inhabitants. Col. 2, l. 5 and 6, *delete* the numbers; l. 8 and 9, *r.* 15,620—6624; l. ult. *r.* 22,133 inhabitants, of whom 9663 were slaves in 1810.

HALLATON, l. 3, *r.* 147, and 598.

HALLOWELL, l. ult. *r.* 2068.

HALSTEAD, l. 5 and 4 from the close, *r.* 1811—722—3279.

HALTON. In 1811, this township contained 151

houses, and 894 persons; 463 being males, and 431 females.

HALTWHISTLE. In 1811, this township contained 142 houses, and 751 persons; 368 being males, and 383 females.

HAM, l. 6, *r.* 1811—182, and 1267; l. ult. after marsh, add—The number of houses, in 1811, was 1344, and of inhabitants 8136.

HAMBATO, l. 3, after Quito, add—See RIOBAMBA.

HAMDEN, l. 4, after Wincasset, add—See HAMPDEN; l. 6, *r.* 1716.

HAMILTON, in Scotland. This town and parish, in 1811, contained 768 houses, and 6453 persons; 2928 being males, and 3525 females: 243 families employed in agriculture, and 1131 in trade, &c.

HAMILTON, l. 3, *r.* 780; l. 6, after Northampton, add—the latter having 1044, the second having 1263 inhabitants; l. 8, add—and others, *r.* 15,258. Add—Also, a township of Ohio, in Trumbull county, having 326 persons.—Also, a township of Ohio, in Warren county, having 1238 inhabitants.

HAMILTONIA, in *Botany*, Ait. Hort. Kew. v. 5. 480. See PYRULARIA.

HAMLETS, TOWER, a particular district in the county of Middlesex, commanded by the constable of the Tower, or lieutenant of the Tower-hamlets, for the service and preservation of that royal fort.

The *Royal Tower-Hamlets* comprehend the militia raised in the district of the Tower, which is divided into two battalions, *viz.* 1st and 2d, officered like other corps belonging to that establishment, and subject to the same regulations.

HAMMERSMITH, l. 3, *r.* 1811—978—7391.

HAMPDEN. Add—containing 1279 inhabitants.

HAMP-

HAMPSHIRE, col. 2, l. 14, r. 1811; l. 15, r. 43,210; l. 16, r. 245,080—118,855; l. 17, r. 126,228.

HAMPSHIRE, in America, l. 7, r. 64—76,275; l. 16, r. containing 9784 inhabitants, of whom 929 are slaves.

HAMPSTEAD, col. 2, l. 8 from the end, r. 1811—842—5480.

HAMPSTEAD, in America, l. ult. r. 1810—738.

HAMPTON, l. ult. r. 1811—229—1984.—In America, l. 2, r. 1274.

HAMPTON, *Éaß*, l. 3, r. 660; l. 9, r. 1810; l. 10, r. 990; l. 18, r. 1840; l. ult. r. 570.

HANCOCK, l. 7, r. 31,031; l. 13, r. containing together with its town 13,330 inhabitants, of whom the slaves in the county are 6278, and in the town 78; l. 19, r. 1049; l. 23, r. 1184; l. 26, r. 311.

HANIFAH, ABOU, in *Biography*, a celebrated Mahometan doctor of the 8th century, who was the founder of the sect denominated Hanifites, and who was imprisoned at Bagdad by the caliph Almanfor, because he would not subscribe to the doctrine of absolute predestination. He was born at Cufa in the year 700, and died in prison in the 70th year of his age. After his death his doctrine acquired reputation; and in the year 1002 a mausoleum was erected to his memory, and also a college for the votaries of his sect. This brief account of him may not be unamusingly clofed with the following anecdote:—Having received from an adversary a rude blow on his face, he said to the person who thus assaulted him, "I could return you outrage for outrage, but I will not; I could accuse you to the caliph, but I will not; I could pray to God to avenge the affront, but I will not: if the day of judgment were now come, I would pray to God that I might enter heaven with you." D'Herbelot, *Bibl. Orient.*

HANOVER, col. 3, l. 6, after Pennsylvania, add—with 63 inhabitants; l. 9, add—the former having 1387, and the latter 2461 persons; l. 14, r. 1171; l. 16, add—containing 2135 inhabitants; l. 22, add—having 3843 inhabitants.—Also, a town of Burlington county, New Jersey, having 2536 persons.—l. 25, r. containing 15,082 persons, of whom 8454 are slaves.

HANOVER, a township of Ohio, in Columbiana county, having 735 inhabitants.—Also, a township of Ohio, in Licking county, having 651 inhabitants.

HANOVER, *New*. Add—Also, a county of New Orleans, having 11,465 persons, of whom 6442 are slaves.

HANOVER, *Upper*, a township in Montgomery county, in Pennsylvania, with 725 inhabitants.—Also, a township in Northampton county, in the same state, having 939 persons.—Also, a township in Beaver county, in the same state, having 1090 persons.

HARAN. Add—This is a town of the pachalic of Orfa, inhabited by wandering Arabs, who were led hither by a plentiful supply of water, and situated in N. lat. 36° 52', E. long. 36° 5', on a flat sandy plain. See CHARRÆ.

HARBOROUGH, col. 2, l. 30, r. 1811—335—1704.

HARDEN. See HARDIN.

HARDIN, or HARDEN, r. 7330—893; add—Also, a township of Preble county, in Ohio, having 802 inhabitants.

HARDISTON, a town of Suffolk county, in New Jersey, having 1702 persons.

HARDWICK, l. 2, r. 734; l. 4, r. 1657; l. 6, add—containing 2561 persons.

HARDWICKIA, in *Botany*, so called in honour of a most able and indefatigable botanist and zoologist, Col. Thomas Hardwicke, P. L. S. long resident in the East Indies. Roxb. *Corom.* v. 3, p. 6.—Clafs and order, *Decan-*

dria Monogynia. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Juss.

Éfl. Ch. Calyx none. Petals five, nearly equal. Legume with one seed.

1. *H. binata.* Roxb. t. 209.—Native of the mountains of the coast of Coromandel. A large and handsome tree, yielding valuable timber. *Leaves* alternate, stalked, binate; leaflets unequally elliptical, entire, smooth, from one to three inches long. *Flowers* numerous, rather small, yellowish, in axillary and terminal panicles. *Legume* lanceolate, an inch and a half long. *Seed* wedge-shaped, inserted at the summit.

HARDY, l. 2, r. 5525, of whom 749 are slaves.

HAREWOOD, l. 5, r. In 1811, its five townships contained 259 houses, and 1315 persons.

HARFORD, l. 3, r. 21,258—4431; add—Also, a township of Luzerne county, in Pennsylvania, having 478 inhabitants.

HARLEM, l. 2, r. 939.

HARLESTON, l. 17, r. 1811; l. 18, r. town and Reddenhall; r. 277—1516.

HARLOW. In 1811, the parish contained 256 houses, and 1695 persons; 883 being males, and 812 females: 191 families employed in agriculture, and 102 in trade, manufactures, and handicraft.

HARMONY. Add—It contained, in 1810, 80 persons.—Also, a township of Ohio, in Champaign county, having 595 inhabitants.—Also, a township of Maine, in the county of Somerset, having 351 inhabitants.

HARP, col. 2, l. 10 from the bottom, for lyre r. liar.

HARPERFIELD. Add—Also, a township of Geauga county, in Ohio, having 490 inhabitants.

HARPSWELL, a township of America, in Maine, and county of Cumberland, having 1190 inhabitants.

HARRAN. See HARAN.

HARRINGTON, l. 3, r. 469; at the close, add—It contains 2187 inhabitants.

HARRISON, l. 6, r. 9958 inhabitants, of whom 458 were slaves in 1810; l. 9, r. 7883, of whom 989 were slaves.

Add—Also, a town of Maine, in Cumberland county, having 439 inhabitants.—Also, a township of Ohio, in Pickaway county, having 291 inhabitants.—Also, a county of Indiana, containing 2338 inhabitants; of whom, in 1810, 15 were slaves.—Also, a township of the said county, the other being Exeter.—Also, another county in the same territory, which, with its township, Washington, contains 1257 persons, including 6 slaves.

HARROW, col. 2, l. 9, infer—The town, with the hamlet of Roxath and Sudbury, contains 283 houses, and 1689 inhabitants.

HARROWGATE, l. *penult.* add—The township of Bilfon and Harrowgate contains 286 houses, and 1583 persons.

HARTFORD, l. 3, r. 1831; l. 6, r. Oxford for Cumberland; l. 7, r. 720; l. 12, r. 19; l. 13, r. 44733.

HARTFORD *City*, l. 11, r. 3955. Add—Hartford, except the city, a township of Hartford county, Connecticut, contains 2048 inhabitants.

HARTFORD, *Éaß*, l. 4, r. 3240.

HARTLAND, l. 5, r. 2352. Add—Also, a town of Hartford county, in Connecticut, having 1284 inhabitants.

HARWARD, a town of Worcester county, in Massachusetts, containing 1431 inhabitants.

HARWICH, l. 3 and 4, r. 1811—564—3732.

HARWICH, in America, l. 4, r. 1942.

HARWINGTON, l. 2, r. 1718.

HASLEMER, l. 4, r. 146—756.

HASLINGDEN, l. 3 and 4, r. 962—5127.
 HASSELQUIST, l. 5, r. 1722. Col. 2, l. 26, r. 1747;
 l. 32, r. 1749.
 HASTINGS, l. 4, r. 5268—34,826.
 HATFIELD, l. 3, r. 409—2066.
 HATFIELD, l. ult. r. 1811—2677—501.
 HATFIELD, l. ult. r. 805 inhabitants. Add—Alfo, a town-
 fhip of Montgomery county, in Pennsylvania, containing
 652 inhabitants.
 HATHERLEIGH, l. ult. r. 1811—1380, and 223.
 HAVANT, l. 6, r. 1811; l. 7, r. 357, and 1824.
 HAVEN, EAST, l. 3, r. 1209; l. 5, add—containing 30
 inhabitants.
 HAVEN, *Fair*, a town of Rutland county, in Vermont,
 having 645 inhabitants.
 HAVEN, *New*, col. 2, l. 2, for 14 r. 18; l. 3, r. 1810
 —37,064 inhabitants, of whom 50 are slaves; l. 17, after in,
 add—1810, 5772 perfons; l. 26, add—For fome further
 particulars, fee NEW HAVEN and UNITED STATES.
 HAVEN, *New*, a township of New Haven, which, the city
 excepted, contains 1195 inhabitants.
 HAVERFORD, l. 2, r. 754.
 HAVERFORDWEST, l. 19, r. and alfo feven fairs in the
 year for, &c.; *dele* on the 7th of July; l. 41 and 42, r.
 1811—3093, and 630.
 HAVERHILL, l. 5, r. 1811—242—1216. Do. in
 America, col. 2, l. 13, r. 2682.
 HAUYNÉ. See MINERALOGY, *Addenda*.
 HAWARDEN, l. 7, r. 1811—832—4436.
 HAWICK, col. 2, at the clofe, add—By the return of
 1811, Hawick contained 1163 houfes, and 7645 perfons.
 HAWKE, l. 3, r. 412.
 HAWKINS, l. 1, r. East Tennesse; l. 4, r. 7643; l. 5,
 r. 930.
 HAWKSHEAD, l. 18 from the bottom, r. 1811—
 149—676.
 HAWLEY, l. 2, r. 1031.
 HAY, l. 4, r. The parliamentary return of 1811 fates
 the number of inhabitants to be 1099, and that of houfes
 231. It has one market on Thurfday, and five fairs. A
 woollen manufacture has lately been eftablifhed here.
 HAYLING, l. 7, r. 1811—110—620.
 HAYNES, a township of Centre county, in Pennsylvania,
 having 1791 inhabitants.
 HAYTI, a name given by the natives to the ifland of
St. Domingo (which fee). The dimenfions are differently
 fated by different writers. Some fay, that it extends 140
 or 150 miles in breadth from N. to S., and about 400 miles
 in length from E. to W. Mr. R. Edwards affigns 390 for
 the length; Rainsford fays, that it is more than 450. The
 abbé Raynal represents it as 200 leagues in length, and 60,
 in fome places 80, in breadth. When the French had this
 ifland, a proclamation, announcing its independence, was pub-
 lifhed, figned by Deffalines, Chritophe, and Cherveaux,
 dated Nov. 29, 1803. The liberated blacks now determined
 on difcarding the appellation which the ifland had received
 from Europeans, and revifing the name of Hayti, by which
 it was designated by the aboriginal inhabitants when firft
 vifited by Columbus. On the 11th day of the year 1804, the
 general and chiefs of the army, in the name of the people
 of Hayti, figned a formal declaration of independence, and
 took a folemn oath to renounce France for ever, pledging
 themfelves to each other, to their pofterity, and to the uni-
 verfe, to die rather than fubmit again to her dominion. At
 the fame time, they appointed Deffalines governor for life,
 with power to enact laws, to make peace and war, and to
 nominate his fucceffor. One of the firft acts of his govern-
 ment was to arrange the return of negroes and mulattoes

from the United States of America. He alfo treated with
 the Britifh agent for Jamaica, offering to open his ports to
 flave fhips, and to allow the people of Jamaica the exclu-
 five privilege of felling negroes in Hayti; intending
 thefe not for flavery, but for military fervice. Some of the
 French inhabitants had remained upon the general evacua-
 tion of the ifland, confiding in the favour and mercy of
 Deffalines. But their confidence was misplaced; for in a
 few weeks he meditated their deftruction, and iffued man-
 dates, no lefs perfidious than cruel, for a general mafacre.
 He then proceeded to the fubjugation of the few Spaniards
 who inhabited the eaftern part of the ifland, and with laying
 fiege to the city of Domingo, which was poffeffed by a
 fmall detachment of French troops. In this fiege he was
 unfeceffful; and after his return from it, he affumed the
 title of emperor. The empire was divided into fix military
 divifions, with a general over each, independent of one ano-
 ther. The generals of divifion and brigade compofed the
 council of ftate, and they had a minifter of finance, another
 of war, and a secretary of ftate. All perfons decided their
 differences by arbitration, military crimes were fubjected to
 fpecial jurifdiction: no predominant religion was admitted,
 nor was the ftate to provide for the maintenance of any reli-
 gious intitution. Marriage was declared to be an act purely
 civil, and divorce in fome cafes was allowed. In a cenfus,
 taken in 1805, of the inhabitants of the part of the ifland
 under the power of Deffalines, the returns were about
 380,000, to which fome incidental omiffions 20,000 were
 added, making the whole number 400,000. The regular
 army confifted of 15,000 men, of whom 1500 were cavalry.
 Considerable attention was paid to the fubject of education.
 The young Haytians were generally taught to read and write.
 Deffalines, whilft he poffeffed feveral good qualities, was ferocious
 and cruel; and at length his atrocious acts of tyranny
 caufed an infurrection of the army, which was followed by
 his premature death by violence, on the 17th of October,
 1806. Chritophe, who, fince the expulfion of the French,
 had been fecond in command, immediately affumed the
 fupreme power. He had been a flave in *St. Domingo* at the
 revolution in 1791, and an early friend and faithful
 adherent of Touffaint, whom he refembled in character.
 Difcarding the pompous title of emperor, he modeftly de-
 fignated himfelf “chief of the government of Hayti.” He
 made feveral enactments, and iffued proclamations favourable
 to commerce. Petion, however, foon appeared as a candi-
 date for the fovereign power; the ftruggle between him and
 Chritophe was fierce, and in a battle fought January 1ft,
 1807, between the two armies, Petion was defeated, and
 faved himfelf by flight. In a council convened at Cape
 François, a new conftitution was publifhed Feb. 17, 1807,
 in which flavery was for ever abolifhed in Hayti; and the
 government was vefted in a chief magiftrate for life, who
 appointed his fucceffor. The council of ftate confifted of
 nine members, two-thirds of whom were generals; fo that
 the government approached nearly to an oligarchy. The ftrug-
 gle for fovereignty ftill continued, and was carried on for
 feveral years; many battles being fought, in fome of which
 Chritophe, and in others Petion was victorious. In the
 fpring of the year 1811, Chritophe changed the title of
 prefident for that of king, and the royal dignity was efta-
 blifhed by a conftitutional act in his perfon and family. In
 July 1816, after Louis XVIII. was reftored to the throne,
 commiffioners were fent to *St. Domingo*, entrusted with the
 administration of all the affairs of the ifland, both civil and
 military. Thefe commiffioners addreffed letters to Chritophe,
 which gave offence. Although the two governments
 which rule the northern and fouthern diftricts have not efta-
 blifhed any relations of mutual amity, they have remained

HEAT.

in a state of perfect tranquillity, and have devoted their attention to the cultivation of their respective territories, and to the civilization and improvement of their people. Schools upon a Lancasterian plan have been established. From the zeal manifested by both chiefs in this noble cause of public instruction, and the progress already made in carrying their wife and benevolent designs into effect, there is great reason to hope, that in a few years the island of Hayti will exhibit a population as generally educated as that of any country on the face of the globe. See History of the Island of St. Domingo, &c. London, 8vo. 1818.

HEARING, col. 2, l. ult. infer after ear.—(see EAR.)

HEAT, col. 2, l. 2, infer after CALORIMETER—in the sequel of this article.

HEAT. Many important additions have been made to our knowledge respecting heat and its effects, which our limits will only permit us to mention very briefly here. In doing this, we shall follow the same arrangement as that adopted in the original article, and confine ourselves chiefly to the results.

Capacity for Heat, or Specific Heat.—In the year 1813, a most elaborate set of experiments was published by Delaroché and Berard, on the specific heat of the gaseous bodies. The results of former experimentalists respecting this part of the subject were not, as we remarked, very satisfactory; but from the care with which the present experiments were made, philosophers in general appear inclined to admit their accuracy.

Specific Heat of the Gases referred to Air.			Specific Heat of the Gases referred to Water.		
	Same Bulk.	Same Weight.		Same Bulk.	Same Weight.
Air	1.0000	1.0000	Water	1.0000	1.0000
Hydrogen	.9033	12.3401	Air	—	.2669
Carbonic acid	1.2583	.8280	Hydrogen	—	3.2936
Oxygen	.9765	.8848	Carbonic acid	—	.2210
Azote	1.0000	1.0318	Oxygen	—	.2361
Oxyd of azote	1.3503	.8878	Azote	—	.2754
Olefiant gas	1.5530	1.5763	Oxyd of azote	—	.2369
Carbonic oxyd	1.0340	1.0805	Olefiant gas	—	.4207
			Carbonic oxyd	—	.2884
			Aqueous vapour	—	.8470

From the recent experiments of Dulong and Petit it appears, that the capacity of solid bodies follows the same law as that of liquids, that is to say, it increases with the temperatures measured by an air-thermometer. They would be even increasing according to these experimentalists, if we were to employ a mercurial thermometer. See the section *Expansion by Heat* below. Thus,

The mean capacity of iron, from 0° to 100° = 0.1098
 0 to 200 = 0.1150
 0 to 300 = 0.1218
 0 to 350 = 0.1255.

In the following table, for the other metals they have only given the measures taken at 100°, and at 300°.

	Mean Capacity between 0° and 100°.	Mean Capacity between 0° and 300°.
Mercury	0.0330	0.0350
Zinc	0.0927	0.1015
Antimony	0.0507	0.0549
Silver	0.0557	0.0611
Copper	0.0949	0.1013
Platinum	0.0355	0.0355
Glass	0.1770	0.1900

Combustion, Heat produced by.—A great number of laborious experiments were made by the late count Rumford on this subject, the general results of which we shall briefly mention, as they differ in some degree from those of his predecessors. Thus, according to him, 1 lb. of

Olive-oil when burnt melted	lbs. Ice.
Rape-oil	93.073
Wax	124.097
Tallow	126.242
Alcohol	111.582
Sulphuric ether	67.470
Naphtha	107.027
	97.834

This philosopher likewise extended his experiments to the combustion of woods, with the view of ascertaining which gave out most heat, and under what circumstances. The general results were, that the wood of the lime-tree gives out most heat, and that of the oak the least, during combustion. The extreme limits of his long table, which we regret we cannot give, were, that 1 lb. of lime-wood, highly dried over a chaffing-dish, melted 54.210 lbs. of ice, while 1 lb. of oak, similarly dried, melted only 39.728 lbs.

Expansion of Bodies by Heat.—The law, as recently established by Dulong and Petit, respecting the expansion of the gases has been given under GAS. We confine our attention here, therefore, to the expansion of liquids and solids. The experiments of Dulong and Petit shew, that the expansion of bodies by heat is not uniform, and that the laws of expansion, as laid down by Mr. Dalton, are not to be depended upon. Thus in the following table of the absolute dilatation of mercury, it will be found that the expansion above the boiling point of water increases as the temperature increases according to the air-thermometer, which from the uniform expansibility of the gases is the only one that indicates equal measures of temperature.

TABLE I.—Expansion of Mercury.

Temperatures deduced from the Dilatation of Air.	Mean absolute Dilatation of Mercury.	Temperatures indicated by the Dilatation of Mercury supposed uniform.
0°	0	0°
100	$\frac{1}{273.5}$	100
200	$\frac{1}{273.5}$	204.61
300	$\frac{1}{273.5}$	314.15

TABLE II.—Expansion of Glass.

Temperatures deduced from the Dilatation of Air.	Mean apparent Dilatations of Mercury in Glass.	Absolute Dilatation of Glass in Volume.	Temperatures deduced from the Dilatation of Glass supposed uniform.
100°	$\frac{1}{273.5}$	$\frac{1}{273.5}$	100°
200	$\frac{1}{273.5}$	$\frac{1}{273.5}$	213.2
300	$\frac{1}{273.5}$	$\frac{1}{273.5}$	352.9

In the above table, on the dilatation of glass, the third column shews that its expansion is not uniform, but increases, except between 0° and 100°, where it is the same as stated by Lavoisier and Laplace. The last column contains the degrees which would be indicated by a thermometer formed

of a glass plate, whose increase in length would serve as a measure of temperatures.

TABLE III.—*Expansion of Metals.*

Temperature deduced from the Dilatation of Air.	Mean absolute Dilatation of Iron.	Temperature indicated by a Thermometer made of a Bismuth Rod.	Mean absolute Dilatation of Copper.	Temperature indicated by a Thermometer made of a Copper Rod.	Mean absolute Dilatation of Platinum.	Temperature indicated by a Thermometer made of a Platinum Rod.
100°	777.55	100°	777.55	100°	777.55	100°
300°	777.55	372.6	777.55	328.8	777.55	311.6

When we compare these results with those obtained from glass, it is seen that the expansibility of solids referred to an air-thermometer is increasing, and that it is unequal to in each of them.

Our readers will observe, that MM. Dulong and Petit used the centigrade thermometer. See further on this subject under REFRIGERATION.

See an Essay which gained the prize voted by the Academy of Sciences in 1818, entitled *Recherches on the Measure of Temperatures, and on the Laws of the Communication of Heat*, by MM. Dulong and Petit.

Animal Heat.—The above determinations of the specific heats of oxygen gas and carbonic acid by Delaröche and Berard, very much diminish the probability of Dr. Crawford's theory of animal heat. But the most formidable objections to this theory result from the experiments of Mr. Brodie. This gentleman found that when artificial respiration is kept up in the lungs after decapitation, the usual proportion of carbonic acid gas is formed, and the circulation continues nearly as usual, yet that in these animals the heat diminishes more rapidly than in the dead animal in which artificial respiration is not kept up. From these experiments, Mr. Brodie concludes that the production of animal heat is owing to the action of the brain; and not to respiration. See RESPIRATION.

HEATH, in *Geography*, a town of Hampshire, in Massachusetts, containing 917 inhabitants.

HEAVY SPAR. See MINERALOGY, *Addenda*.

HEBRON, l. 2, r. 563; l. 3, r. Oxford for Cumberland; l. 5, add after Portland—containing 1211 inhabitants; l. 8, r. 2002.

HEIDELBURG, l. 4, r. 3532; l. 6, r. 1433. Add—Also, a township in Pennsylvania, in Berks county, having 2808 inhabitants.

HEITSBURY, col. 2, at the close, r. the population of the borough and parish, returned in the year 1811, was 1023; the number of houses 198.

HELEN'S, ST., l. 9, r. 106—658.

HELLAM, a township of Pennsylvania, in York county, having 1410 inhabitants.

HELLENISTS, col. 2, l. 24, r. HELLENISM.

HELMSLEY, l. 5, r. 1811—261; l. 6, r. 1415.

HELMSTON, col. 2, l. 2, r. 2297—328.

HEMATIN, in *Chemistry*, the name given by Chevreul to the peculiar matter constituting the colouring matter of the *hamatoxyton campechianum*, or logwood.

Hematine may be obtained by digesting, for several hours, logwood-powder in water, of the temperature 125°. The liquid is then to be filtered, evaporated to dryness, and di-

gested for a day in alcohol of the sp. gr. 837. Filter the alcohol, concentrate it by evaporation, then add a little water, evaporate a little further, and leave it to itself. Crystals of hematine are deposited in abundance. Thus prepared, it is in the form of small brilliant crystals, of a reddish-white colour, and a slightly astringent bitter and acrid taste. It is readily soluble in boiling water, and the solution is of an orange-red colour when warm, which becomes yellow as it cools, but heat again restores the original colour. Acids render it at first yellow, then red; sulphureous acid destroys it altogether. The alkalis and alkaline earths give it a purplish-red colour, and if in excess appear to decompose it. Molt of the metallic oxides unite with hematine, and give it a blue colour. Gelatine throws it down in reddish flocks. The other properties of this substance do not appear remarkable.

HEMEL-HEMSTED. At the close, insert—The population of the parish, by the return of 1811, amounted to 3240, and the number of houses to 638.

HEMIONUS. See EQUUS.

HEMLOCK, in *Geography*, a township of Northumberland county, in Pennsylvania, having 879 persons.

HEMPFIELD. Add—The former contains 3431, and the latter 3444 inhabitants.

HENDERSON, in Kentucky, l. 2, r. 4544; l. 3, r. 1467. At the close, add—containing 159 persons, of whom 47 were slaves in 1810.

HENLEY-upon-Thames, l. ult. r. 1811—522—3117.

HENLEY in Arden, l. 5, r. 1811—242; l. 6, r. 1035.

HENNIKER, a town of Hillsborough county, in New Hampshire, having 1608 inhabitants.

HENRICO, l. 2, r. 9945; l. 3, 4846.

HENRY, l. 4, r. 5611 inhabitants, of whom 1755 were slaves in 1810; l. 6, r. 6652 inhabitants, of whom 1103 were slaves.

HEPATIC, in *Botany*, so named by the earlier botanists and physicians, from a resemblance in the lobes of the leaves to those of the human liver, is restored as a distinct genus from ANEMONE, (see that supplementary article,) by professor De Candolle, in his Syst. v. 3. 215, merely because the *involucrum* is placed very near to the flower, (some have thought it an actual perianth), and its leaves undivided. We hesitate to follow our learned friend in this measure, the certain species of *Hepatica* being scarcely more than one or two, so that nothing is gained as to convenience, nor is the character very declivé. These species are,

1. *H. triloba*. Common *Hepatica*. (*Anemone Hepatica*; Linn. Sp. Pl. 758. Sm. Fl. Græc. Sibth. t. 513, unpublished. Fl. Dan. t. 610, not 612.)—Leaves heart-shaped, with three entire lobes.—Native of Europe and North America. A common hardy garden plant, with blue pink, or white, single or double, very early, blossoms. The synonyms are numerous. De Candolle by a casual error cites Engl. Bot. t. 51.

2. *H. angulosa*. Angular, or Serrated, *Hepatica*. Lamarck Dict. v. 1. 169.—Leaves palmate, with five serrated lobes. Cultivated formerly at Paris, but now lost. It is much to be wished that we could learn more concerning this plant.

3. *H. integrifolia*, with ovate entire leaves and very hairy stalks, found by baron Humboldt in South America, is not clearly an *Hepatica*.

HEPATITE. See MINERALOGY, *Addenda*.

HERAT. Add—The ancient *Aria* or *Ariacoana*, capital of Ariana; l. 4, after name, insert—or Herirood; l. 5, after which, add—gives fertility to the plain, 30 miles long and 15 broad, upon which Herat is situated, and which,

which, though surrounded with lofty mountains, is highly cultivated, and covered with villages and gardens. The Herat, or Herirood, afterwards runs, &c.; l. 5, for It r. Herat embraces an area of four square miles, and, &c.; l. 6, add—This castle is of a square form, elevated on a mound, flanked with towers at the angles, and built of burnt brick. The city has a gate in each face, and two in that which fronts the north, and from each gate a spacious and well-supplied bazaar leads up towards the centre of the town. It is well supplied with water, every house almost having a fountain independent of those that are public on either side of the bazaars:—l. 23, add—The residence of the prince is a mean building, having a gallows in the centre of the square, which is situated in its front; and the chief mosque, once a noble edifice, enclosing an area of 800 square yards, is falling into decay. Herat is computed to contain 100,000 inhabitants, 10,000 being Patans, and the rest Afghans, a few Jews, and 600 Hindoos, the last-mentioned of whom are highly respected, and they only possess capital or credit; hence they derive a very considerable influence. The trade of this city, as we have already said, is extensive, and accordingly it is the emporium of the commerce carried on between Cabul, Cashmere, Bucharia, Hindoostan, and Persia. From the former, they receive shawls, indigo, sugar, chintz, muslin, leather, and Tartary skins, which they export to Meshed, Yezd, Kerman, Ispahan, and Tehraun, receiving in return chiefly dollars, tea, china-ware, broad-cloth, coffee, pepper, and sugar-candy; dates and shawls from Kerman and carpets from Ghaen. The staple commodities of Herat are, silk, coffee, and affaetida, which are exported to Hindoostan. The gardens are full of mulberry-trees, cultivated merely for the sake of the silk-worm, and the adjoining plains produce affaetida. The winters here are very severe, and the cold often injures the crops; but the fertility of the plain is such that it affords an immense produce both of wheat and barley, and almost of every kind of fruit known in Persia. The cattle are small, but not plentiful, and the broad-tail sheep are abundant. The revenue of this city is estimated at 4½ lacs of rupees. The prince in possession pays a tribute to his Persian majesty of 50,000 rupees a year. N. lat. 34° 12'. E. long. 63° 14'.

HEREFORD. At the close, add—By the return of 1811, Hereford contains 1583 houses, and 7306 inhabitants.

HEREFORD, a township of Berks county, in Pennsylvania, having 1140 inhabitants.

HEREFORDSHIRE, col. 2, l. 7 from bottom, r. 1811—18,572—94,073.

HERKIMER, a county of New York, containing 22,046 inhabitants, of whom 64 are slaves.

HERMINIUM, in *Botany*, a name by which Linnaeus its author seems, in *Phil. Bot.* 171, to allude to Hermes, or Mercury, but without any explanation.—*Linn. Gen. ed.* l. 271. Br. in *Ait. Hort. Kew.* v. 5. 191. *Sm. Compend. ed.* 2. 130.—Class and order, *Gynandria Monandria*. *Nat. Ord. Orchideae*.

Eff. Ch. Calyx spreading. Petals three-lobed, like the lip, which has no spur. Anther fixed, nearly terminal.

1. *H. monorchis*. *Mulk Herminium*. (*Ophrys monorchis*; *Linn. Sp. Pl.* 1342. *Engl. Bot.* t. 71.)—“Radical leaves two, lanceolate.”—Native of chalky pastures in Europe. A small plant, with yellowish mulky-scented flowers. No genus is better defined, but we know nothing of any other species indicated by Mr. Brown’s specific character.

HERO, *North*, l. 2, of Grand Isle county; l. 3 and 4, r. 1810—552.

HERO, *South*, l. 3, r. 826; l. ult. r. 623.

HERRIOT. See HARIOT.

HERTFORD, col. 2, l. 13 from the bottom, r. 1811—3900; l. 12, 2038—1862; l. 11, r. 592.

HERTFORD, in America, l. 2, r. 6052—2805.

HERTFORDSHIRE, col. 2, l. 28 and 29, r. 1811—20,345—111,654—55,023—56,631.

HESUS, in *Mythology*. See DRUIDS.

HEXHAM, l. 4. In the year 1811, Hexham parish, divided into four wards, or townships, comprehended 478 houses, and 3518 persons; and Hexham shire, including four quarters or townships, had 251 houses, and 1328 persons.

HEYNE, CHRISTIAN GOTTLÖB, in *Biography*, was born at Chemnitz, in September 1729, and rose from humble life, after struggling with many difficulties, on account of the penury of his condition, to an eminent rank, as a critical scholar and philologist. Although his parents were hardly able to derive a scanty subsistence from their labour, he was sent to school, and made such proficiency in learning, that in his tenth year he was able by teaching others to defray the expences of his own education, and by the assistance of a neighbouring clergyman, he entered himself at a grammar-school; and having acquired a competent knowledge of the Latin and Greek languages, he was sent to the university of Leipzig. Private teaching, however, was his resource for further supplies, and thus furnished he devoted himself to the profession of the law; and industrious in his study of the Roman law and history, he was qualified for reading lectures, which were much approved, on the Roman antiquities. Under the patronage and recommendation of count Bruhl, the Saxon minister, which he obtained by a Latin elegy, he was invited to Dresden, whither he repaired in 1752 with flattering expectations, which were eventually disappointed; so that he was reduced to a state of indigence and distress, without the means of providing either food or lodging. At length necessity compelled him to become a writer, and by one of his performances as a translator of a Greek romance, he acquired that taste for criticism which raised him to that eminence in this department of literature which he afterwards occupied. His next work was an edition of Tibullus, which was followed in 1756 with his first edition of Epictetus. But his prospects, which appeared promising in consequence of his access to the Bruhlean library, were again precluded by the incursion of the Prussians into Saxony, which occasioned the sudden removal of count Bruhl from Dresden, and the dispersion of his library. After some changes of situation, he repaired to Dresden in the year 1760; and in the following year married a lady, named Theresa Weifs, to whom he had for some time been affectionately attached. In 1763 he was invited to Gottingen to supply the vacant professorship of John Matthias Geiner. The subjects of his first academic lectures were, Horace, the Georgics of Virgil, and some parts of the Tragic writers. In 1766 he explained the Iliad, and afterwards the Greek antiquities. His leisure hours, after his first settlement at Gottingen, he employed as a writer and translator. Having been appointed, in 1763, first librarian to the university, he obtained, in 1770, the title of aulic counsellor, and became secretary to the Royal Society of Sciences, and editor of the *Literary Gazette*. In 1771, he collected the papers presented to the society for sixteen years, which had been neglected, and published the first volume of the “*Commentarii Novi*,” which was dedicated to the king. The first edition of his *Pindar* appeared in 1773. His “*Catalogue of the Library*,” begun in 1777, was completed in 1787, and extended to about 150 volumes in folio. But his opus majus, on which

he bestowed the greatest part of his attention and time, was his edition of Homer, which he began in 1787, and which was presented to the public in 1802. A second edition of his Virgil appeared in 1788; in the revival and improvement of which he derived great assistance from his literary friends, particularly Van Santan in Holland, and Jacob Bryant in England. During the autumn of this year, he made a tour to Switzerland, and formed an acquaintance with several of the most eminent literary characters in that country; and on his return he was offered the place of chief librarian at Dresden, and a professorship at Copenhagen, both which he declined. The principal object of his attention was the Royal Society of Gottingen, of which he was secretary; and which was enlarged by the admission into the number of its members of several French literati. By means of his reputation and influence, he preserved the society, in 1803, from the miseries incident to a state of war, and from any molestation on the part of the French army. After a tour to Armitadt in 1806, on a visit to one of his daughters recently married, his infirmities increased, so that in 1809 he resigned his office as professor of eloquence. In 1810 he was made a knight of the Westphalian order of the crown, and died in the month of July 1812. Few persons have been more diligent in the improvement of their time than Heyne, or devoted more time in the day to literary occupations, without secluding himself from domestic and social enjoyments. He was twice married; by his first wife he had one son and two daughters, one of whom was married to George Forster, son of the celebrated Dr. John Reinhold Forster, and on his death to Mr. Huber. By his second wife, who was daughter of George Frederick Brandes, alic counsellor, he had two sons and four daughters. His works were too numerous for recital within our limits. We refer for an account of them to the General Biography, Appendix.

Vol. XVIII.

HICKMAN, in *Geography*, a town of West Tennessee, containing 2583 persons.

HICKUP, l. 7, add—See **LUNGS**.

HIIETANS, the name of a people of North America, who traverse a region extending from the limits of the state of Louisiana to the Rio Gila, and to the eastern declivity of the Californian coast, within a short distance of the shores of the Pacific ocean. In following the herds of buffalo, which change their pasture with the seasons, they resemble the wandering tribes of Tartars and Arabs, who have no settled residence. Encamped where they find water and their prey, they remain as long as they can obtain a supply. The Hietans have domesticated the horse, and vie with the most civilized people in their management of this useful animal, in mounting it and applying its force to the purposes of chase or war. They are the only people, aborigines of this continent, who seem to have acquired the ability to withstand the shock of cavalry furnished with the principles of European tactics.

HIGHAM FERRERS, col. 2, l. 8, r. 1230, and 6627.

HIGHGATE, in America, l. 3, r. 1374.

HIGHWORTH, col. 2, l. ult. r. Highworth parish, in 1811, contained 480 houses, and 2514 inhabitants.

HILLSBOROUGH, in America, l. 6, r. 49, 249; l. 11, r. 1592.

HILLTOWN, l. 4, r. 1335.

HINEKLEY, col. 2, l. 5 from bottom, r. 1811—6098, and 1097.

HINDON. Add—By the returns of 1811, the borough and parish contained 170 houses, and 781 persons.

HINDSDALE, a town of Berkshire, in Massachusetts, containing 822 inhabitants.

HINESBURGH, a town of Chittenden county, in Vermont, having 1238 persons.

HINGHAM, l. 3 and 4, r. 241—1263.

HINGHAM, l. 1, r. Plymouth for Suffolk; l. 7, r. 2382.

HINSDALE, l. 4, r. 740.

HIRAN, l. 2, r. Oxford for York, and 336; add—Also, a township of Ohio, in Portage county, having 171 inhabitants.

HIRUNDO. At the close, for **SWALLOW** r. **MIGRATION**.

HITCHIN, l. ult. r. 1811, the hundred of Hitchin and and Pirton contained 1529 houses, and 7732 inhabitants.

HOCKSTETT. Add—See **BATTLE**.

HOCKING, a town of Fairfield county, in Ohio, having 1078 inhabitants.

HODSON, a township of Portage county, in Ohio, having 793 inhabitants.

HOLDEN, l. 3, r. 1072.

HOLDERNESS, l. 4, r. 835.

HOLLAND, in America, l. 4, r. 420. Add—Also, a town of Orleans county, in Vermont, having 126 inhabitants.

HOLLES, l. 4, r. 1529.

HOLLISTON, l. ult. r. 1810—989.

HOLLOW SPAR. See **MINERALOGY**, *Addenda*.

HOLLY, *Mount*, in *Geography*, a town of Rutland county, in Vermont, having 922 inhabitants.

HOLOCENTRUS, in *Ichthyology*, a genus of the Thraciaci order of fishes; the characters of which are, habit of the genus Perca; gill-covers scaly, serrated, and aculeated; and scales, in most species, hard and rough. The species enumerated and described by Dr. Shaw are as follow: *viz.*

1. *With forked or lunated tail.*

SAGO. Silvery-red H. with longitudinal yellow lines on each side, very beautiful, about a foot long, resembling a carp, but of a more square form, and becoming suddenly slender near the tail, eyes large and gold-coloured, scales large, and denticulated at the edges. Native of the Indian, American, and Mediterranean seas, and held in high estimation for the table.

SCHRAETSER. Brownish H. with four longitudinal black lines on each side, silvery abdomen and naked head; the *perca* schraetser of Gmelin's Linnæus. Native of the Danube, and of its tributary streams, esteemed for food.

RADULA. H. with the body lined with white specks; P. radula of Gmelin's Linnæus. Native of India.

GATERINA. Blueish H. with black specks and scattered spots; Sciena gaterina of Gmelin's Linnæus. Native of the Arabian seas, varying in size and colours.

VIRESCENS. Greenish H. with transverse dorsal semicurrent olivaceous bands, and head streaked with yellow. Native of the Indian seas.

QUINQUILINEATUS. Yellowish H. with brownish back, and body marked on each side by five longitudinal blue lines. Native of Japan.

BENGALENSIS. Subfulvous H., silvery beneath, and marked on each side of the upper part by five longitudinal blueish bands, margined with black. Native of Bengal.

TIGRINUS. White H. with the body transversely banded, and fins spotted with black. Native of the Indian seas, and esteemed for the table.

DECUSSATUS. White, with brown back, and body marked by

by two longitudinal and seven transverse brown bars. Native of the American seas.

STRIATUS. Subluteous H. with brownish back, body marked by transverse brown bands, dorsal fin ramentose behind, and marked by a black spot. Native of unknown regions.

ARGENTINUS. Brownish H. with silvery sides. Native of regions unknown.

NIGER. Black H. with extremely minute scales: found about the coast of Cornwall.

ACERINUS. With fourteen soft and seventeen spiny rays in the dorsal fin; perca acerina of Gmel. Linn. Native of the Euxine sea, and esteemed as food.

CÆRULESCENS. Bluish H. with all the fins yellow. Native of the Indian seas.

2. *With undivided or rounded tails.*

VARIEGATUS. Red H. with seven transverse black lines, and the head and abdomen varied with blue streaks: perca marina of Linn. Gmel. Native of the Mediterranean and northern seas.

COTTOIDES. With all the fins marked by two speckled lines. Native of the Indian seas.

PHILADELPHICUS. Perca philadelphia of Linn. Gmel.

GIGAS. Ochraceous H. with brown clouds, three-spined gill-covers, and eleven dorsal spines: perca gigas of Linn. Gmel. Native of the Mediterranean.

FORSKALII. Red H. with four broad transverse whitish bands: perca fasciata of Linn. Gmel. Native of the Red sea.

TAUVINUS. Linear-oblong H. with blackish ferruginous spots: perca Taurina of Linn. Gmel. Native of the Arabian seas.

ONGO. Brown H. with the body marked transversely by elongated spots, and the dorsal, anal, and caudal fins spotted with yellow. A native of Japan.

AURATUS. Gold-yellow H. with red specks. Native of the East Indies.

QUADRILINEATUS. Silvery H. with brownish back, and body marked above by four longitudinal black lines on each side. Native of the East Indies.

FASCIATUS. Green-yellowish H. with transverse brown bands divided beneath. Native of a region unknown.

PUNCTATUS. Yellow H. sprinkled over with black spots and red points. Native of the Brazilian seas.

CALCARIFER. Subargenteous H. with brownish back, large scales, and spotted gill-covers. Native of Japan.

SURINAMENSIS. Brownish H. with subluteous clouds, red head, and anterior gill-covers spine-ciliated. Native of Surinam.

AFER. Oblong-ovate brown H. with small scales and short tail. Native of the coasts of Guinea, in high estimation for food.

JAPANICUS. Red H. with small scales, and blue and yellow irides. Native of Japan.

MEIRA. White H. spotted on all parts with brown. Native of the Japanese seas.

TESTUDINEUS. Subluteous H. with slightly branching brown bands, blue-striped gill-covers, and blackish fins. Native of the northern seas.

MARGINATUS. Bluish H. with brownish back, red fins, and dorsal fin edged on the fore-part with black. Native place unknown.

SONNERATHI. Yellowish H. with three transverse silvery bands, edged with brown. Native of the Indian seas.

LANCEOLATUS. Silvery H. transversely banded with

brown, and with the dorsal, anal, and caudal fins sublanceolate. Native of the East Indies.

CÆRULEO-PUNCTATUS. Bluish H. with pale yellow clouds, and deep-brown fins spotted with blue. Native country unknown.

BICOLOR. Bluish H. with irregular white spots. Shaw's Zoology, vol. iv. pt. ii.

HOLT, l. 7, r. 216—1037.

HOLT, l. 1, r. for Grefford r. of the same name; l. ult. r. 1811—161—813.

HOLYHEAD, l. 5 from last, r. 1811—539—3005.

HOLYWELL. In 1811, the town of Holywell contained 1313 houses, and 6394 persons; viz. 2925 males, and 3469 females: 117 families being employed in agriculture, and 752 in trade, manufactures, and handicraft.

HOMER, col. 2, l. 23, for Cos r. Jos.

HONEY BROOK, a township of Chester county, in Pennsylvania, containing 1073 inhabitants.

HONITON, l. 16, after act, add—in the borough and parish; l. 17, r. 581 and 2735.

HOPE, col. 2, l. 13, add—Alfo, a town of the district of Maine, in the county of Lincoln, having 787 inhabitants.

HOPEA, in *Botany*, a fourth genus, (see our former HOPEA,) thus inscribed, in Roxb. Corom. v. 3. 7. t. 210. is very nearly allied to DIPTEROCARPUS, (see that article,) though different in the aspect of the flowers.

HOPEWELL, l. 5, after York, having 1577; after Huntingdon, 805; after Washington, 2193; l. 8, r. 1810; l. 9, r. 2565; l. 10, add—containing 1987 inhabitants.—Alfo, a township of Fairfield county, in Ohio, having 478 inhabitants.

HOPKINS, a county of Kentucky, having 2927 inhabitants, of whom, in 1810, 404 were slaves.

HOPKINTON, l. 2, r. 1345; l. 8, r. 1774.

HOPS, col. 10, l. 28, r. 3250.—*Laws relating to*, l. 5, insert—See also 45 Geo. III. c. 94. 49 Geo. III. c. 98. and the duties that are imposed on hops.

HORNBLLENDE. See MINERALOGY, *Addenda*.

HORNBLLENDE Slate. See MINERALOGY, *Addenda*.

HORNSEY, l. ult. r. In 1811, the parish consisted of 147 houses, and 704 inhabitants.

HORNSEY, l. 12 and 13, r. 1811—807, and 3349.

HORN-STONE. See MINERALOGY, *Addenda*.

HORSE, col. 11, l. 22, r. 23, 10d. Col. 12, l. 25 from bottom, r. 22f. 10s.; l. 21, r. 11f. 5s.; add—On the subject of duties on horses, see TAX.

HORSHAM, l. 32, r. In 1811, the borough contained 287 houses, and 1714 inhabitants; and the whole parish, including the borough part, contained 622 houses, and 3839 inhabitants.

HORSHAM, in America, l. 2, r. 938.

HOSPITAL, BRIDEWELL, col. 2, l. 18, r. which exceeded the receipt by, &c.

HOVEA, in *Botany*, in memory of Mr. Pantaleon Hove. (See POIRETIA).—Br. in Ait. H. Kew. v. 4. 275. (Poiretia; Sm. Tr. of L. Soc. v. 9. 304).—Class and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juff.

Ell. Ch. Calyx two-lipped; upper lip cleft, abrupt. Stamens all connected. Keel obtuse. Legume sessile, roundish, tumid. Seeds two crested.

H. linearis, (very near *H. lanceolata*, Curt. Mag. t. 1624,) a linear-leaved shrub, with blueish-purple flowers, and smooth legumes; and *H. longifolia*, whose leaves are longer, and legumes downy, are the only species in Hort. Kew., both

natives of New South Wales. Our *P. elliptica*, L. Tr. v. 9. 305 may be doubtful.

HOUGHTON-LE-SPRING, in *Geography*, a township in a parish of the same name, and in Easington Ward, in the county of Durham. In 1811, it contained 221 houses, and 1356 persons; viz. 663 males, and 693 females: 44 families being employed in agriculture, and 68 in trade and manufacture. The parish includes 18 townships.

HOWARD, a township of Centre county, in Pennsylvania, having 761 inhabitants.

HOWDEN. In 1811, this township contained 314 houses, and 1812 persons; viz. 830 males, and 982 females.

HOWELL, a township of Monmouth county, in New Jersey, having 2780 inhabitants.

HUBARDTON. See **HUBBARTON**.

HUBBARD, a township of Ohio, in Trumbull county, having 674 inhabitants.

HUBBARDSTON, l. 3, r. 1127.

HUBBARTON, or **HUBARDTON**, l. 2, r. 734.

HUDDERSFIELD, l. 27, r. 1811—1871—9671.

HULL, col. 5, l. 9 from bottom, r. 1811; l. 8, 4611; l. 7, 26,792—11,998—14,794.

HULL, in America, l. 1 and 2, for Suffex r. Plymouth; l. 3, r. 132.

HUMITE. See **MINERALOGY**, *Addenda*.

HUMMOCK, l. 12 from bottom, *delete* the reference (see that article).

HUMOURS of the Eye, *Chemical Properties of*. See **EYE**.

HUMPHRIES, in *Geography*, a county of West Tennessee, having 1511 persons, of whom 132 were slaves in 1810.

HUNGARY, col. 2, l. 33, after inhabitants (in 1810, 7398, 104).

HUNGERFORD, l. 2 from bottom, r. 1811—167—943.

HUNTINGDON, col. 3, two last lines, r. 1811—522—2397—450.

HUNTINGDON, in America, l. 7, r. 16,778; l. 14, r. 476; after Philadelphia, add—the township contains 1698 persons; l. 22, r. 2770.

HUNTINGDON, *North*, *South*, and *East*, three townships, &c. the former containing 2345, the second 1656, and the last 1267 inhabitants.

HUNTINGDON, a township in Luzerne county, in Pennsylvania, having 1114 inhabitants.—Also, a township of Adams' county, in the same state, having 1014 inhabitants.—Also, a township of Adams' county, in Ohio, containing 1375 persons.

HUNTINGDONSHERE, l. 14, r. 7566 houses, 42,208 inhabitants; 20,402 males, 21,806 females.

HUNTINGTON, l. 3, r. 514.

HUNTINGTON, in Connecticut. See **HUNTINGDON**.

HUNTSBURG, l. 3, r. 714.

HURD, *Richard*, in *Biography*, an eminent English prelate, was the son of a reputable farmer, in the parish of Teterhall, in the county of Stafford, and born in January 1719-20. After a preparatory school-education, he was sent to Emanuel college in the university of Cambridge, where he was graduated M.A., and was elected a fellow in 1742. In 1744 he received priest's orders. As a writer, he began his career by an anonymous work, which was, "Remarks on a late Book, entitled an Enquiry into the Rejection of the Christian Miracles by the Heathens, by William Weston, B.D. &c.;" and which was highly commended by Dr. Warburton. As a literary critic, he first laid the foundation of his future fame in 1749, by an ano-

nymous publication, entitled "Horace's Epistles to the Pisos, with an English Commentary and Notes;" and also of his fortune by a compliment paid in the preface to Warburton, whom he afterwards resembled, not only in his advancement, but in his mode of thinking and of writing. By his recommendation to Bishop Sherlock, he was appointed, in 1750, one of the Whitehall preachers. In 1751, he published a "Commentary on Horace's Epistle to Augustus," resembling in learning and ingenuity his former commentary. Both these Commentaries were reprinted in 1753, with two dissertations on dramatic poetry and poetical imitation. This volume was dedicated to Warburton in a high style of panegyric; and it was followed, in 1755, by a piece, entitled "Delicacy of Friendship," in which the anonymous author, known to be Hurd, paid homage to his patron by an attack on Dr. Jortin, who, in his "Six Dissertations," had not treated Warburton with that respect to which, in the estimation of his admirers, he was thought to be entitled. By this pamphlet he gained no reputation, and it is said, that in consequence of some remarks on his subservient disposition, he was desirous of suppressing it, though it has been since reprinted in a late edition of his works. His first church preferment was a college living at Thurcaiton in Leicester, to which he was inducted in 1756, and here he lived for several years in retirement. Soon after Hume's "Essay on the Natural History of Religion" was published, a pamphlet of "Remarks" upon it appeared, of which Hurd was thought to be the author, and which Hume notices in the following terms: "Dr. Hurd wrote a pamphlet against this work, with all the illiberal petulance, arrogance, and scurrility which distinguish the Warburtonian school." These Remarks have been thought to be the joint production of the master and disciple. Hurd's "Letter to Mr. Mason on the Marks of Imitation," published in 1757, is represented by his biographer as "one of the most agreeable and ingenious of the writer's works on elegant criticism." Our author's "Moral and Political Dialogues," which appeared in 1759, contributed to the increase of his literary reputation; and those in particular that relate to the English constitution evince the writer's attachment to Whig principles. In 1762 appeared, without his name, an amusing work, entitled "Letters on Chivalry and Romance," 12mo.; and in 1764 was published another dialogue on "The Uses of Foreign Travel." The several dialogues now recited were published in 1765, in 3 vols. 8vo. introduced with a preface on the manner of writing dialogue. The defence of his patron and friend had in the mean time occasioned a "Letter to the Rev. Dr. Leland of Dublin College;" in which he vindicates Warburton's idea of an inspired language, stated in his "Doctrine of Grace."

Hurd's preferences in the church had not corresponded to his growing literary fame; but in 1765 he was recommended by bishop Warburton and Mr. C. York to the office of preacher at Lincoln's-Inn; and in 1767 he was collated by the bishop to the archdeaconry of Gloucester. In the following year, he was graduated D. D. at Cambridge, and appointed to preach the lectures on prophecy, established at Lincoln's-Inn by Warburton; these were comprised in twelve discourses, which formed a volume of highly valuable theological literature, published in 1772, 8vo. with his explanation of the double sense of prophecy, called by him "a divine artifice." With that excess of ingenuity which in some cases seems to derogate from the simplicity of the gospel, some have been dissatisfied. Having established his reputation both as an elegant writer and an ingenious theologian, Dr. Hurd was promoted without solicitation to the see of Lichfield and Coventry in 1775; and in his first charge to the

the clergy of his diocese, the subject to which he directed their attention was the excellence of the liturgy, inculcating at the same time the duty of submitting all alterations to the wisdom of the church, and thus guarding against that disposition to reform which was manifesting itself among those who formed a considerable party pertaining to the establishment.

In the following year, the learned prelate had the honour of being preceptor to the Prince of Wales and his brother the duke of York. In the same year, he published a volume of sermons preached at Lincoln's-Inn; to which, in 1780, he added two additional volumes, containing a variety of elegant discourses, orthodox with regard to their theology, and conformable to the articles of the church, which he professes highly to venerate. His translation to the see of Worcester took place in 1781, when he was also nominated clerk of the closet; and though he was offered the primacy in 1783, he declined the acceptance of this high dignity. In his retired station at the episcopal seat of Hartlebury, he passed the remainder of his life in attending to the concerns of his diocese, pursuing his literary avocations, and collecting a noble library, which he bequeathed as an heir-loom to the see of Worcester. Of his minor publications, both before and after this period, we shall take no notice; but content ourselves with mentioning his edition of the works of his esteemed friend the bishop of Gloucester, presented to the public in 7 vols. 4to. in 1788; adding afterwards, viz. in 1794, an account of the life, writings, and character of the author. With this performance he terminated his literary labours; and after a gentle and easy decline, he expired, in his sleep, in May 1808, four months after the completion of his 88th year. The literary character of this prelate may be duly appreciated by a perusal of his writings; but with respect to his private character and conduct, we shall adopt the opinion and language of a candid biographer, who says of him, "if a fair abatement be made on account of some literary arrogance and acrimony, probably derived from the same source," (referring to familiarity with the writings of Warburton,) "they will merit unqualified praise. His strict regard to decorum, his liberal courtesy, his warmth of friendship, his moderation and disinterestedness, rendered him equally an object of regard and esteem." Gen. Biog.

HURON, in *Geography*, a town of Cayahuga county, in Ohio, having 424 inhabitants.

HUTCHINSONIA, in *Botany*, dedicated to the memory of the late Miss Hutchins, of Ballylickey, near Bantry, in Ireland, a most intelligent cryptogamic botanist.—Br. in Ait. Hort. Kew. v. 4. 82. Sm. Compend. 98.—Clas and order, *Tetradynamia Siliculosa*. Nat. Ord. *Siliqueae*, Linn. *Crucifera*, Jul.

Eff. Ch. Pouch entire; valves tumid. Seeds two in each cell. Filaments simple.

1. *H. rotundifolia*. Round-leaved Hutchinisia. Ait. n. 1. (*Iberis rotundifolia*; Linn. Sp. Pl. 905. Scop. Carn. t. 37.)—Leaves undivided.—Native of mountains in the south of Europe. Flowers rose-coloured.

2. *H. alpina*. Alpine Hutchinisia. Ait. n. 2. fee *LEPIDIUM alpinum*.—Leaves pinnatifid. Petals twice as long as the calyx. Style short.

3. *H. petraea*. Rock Hutchinisia. Sm. n. 1. fee *LEPIDIUM petraeum*.—Leaves pinnatifid. Petals shorter than the calyx. Stigma feilile.

HYENANCHE. See *TOXICODENDRUM*.

HYALITE. See *MINERALOGY, Addenda*.

HYDE, l. 4, r. 6029—1882.

HYDEPARK, l. 2, r. 261,

HYDRIODATES, HYDRIODIC Acid, in *Chemistry*. See *SIMPLE Bodies*.

HYDROCHLORIC ACID. See *MURIATIC Acid*, and *CHLORINE*.

HYDROCYANIC ACID. See *CYANOGEN* and *PRUSSIC Acid*.

HYDROGEN. For the recent determinations respecting the specific gravity, &c. of this gas, see *ATOMIC Theory*.

HYDROGEN, Arsenical. See *ARSENIC*.

HYDROGEN, Boruretted, the name of a gaseous compound of hydrogen and boron. The existence of such a gas, however, seems somewhat uncertain. Dr. Thomson thinks Gmelin succeeded in forming it by mixing together four parts of iron-filings, and one part of boracic acid, and exposing the mixture to a strong heat for half an hour. When this fused mass was dissolved in muriatic acid, an effervescence took place, and a gas, supposed to be boruretted hydrogen, was extricated; but it was not satisfactorily examined. Sir H. Davy endeavoured in vain to unite boron with hydrogen by heating them together.

HYDROGURET' of Carbon, Phosphorus, and Sulphur, the names by which some have chosen to distinguish compounds of hydrogen with these respective substances, and which were formerly called *carburetted, phosphuretted, and sulphuretted hydrogen*.

HYDROPHILUS. At the close, add—The genus hydrophilus, like that of dytiscus, has been greatly increased by the persevering researches of modern entomologists. Mr. Marshall enumerates twenty-eight British species.

HYDROPHOSPHORIC Acid, HYDROSULPHURIC Acid, HYDROTHIONIC Acid, in *Chemistry*, names which have been given, the first to *phosphuretted hydrogen*, the two last to *sulphuretted hydrogen*.

HYGROMETRY, col. 13, l. 22, add—Mr. Leslie's improved hygrometer is composed of a tube of ivory, containing quicksilver, with a glass tube adapted to it, to which a scale of equal parts is attached. When the ivory yields moisture to the air, which it does according to the dryness of the atmosphere, it contracts, and presses the quicksilver higher in the tube;—when it imbibes moisture from damp air, it swells, and allows the quicksilver to subside. Mr. Leslie finds, however, that these variations do not correspond with the real measures of atmospheric dryness or humidity: near the point of extreme dampness, they are much augmented; while they diminish rapidly towards the other extreme. The addition of another scale, therefore, corresponding to this inequality, is necessary; and even with this, it cannot be regarded as either an accurate or delicate instrument.

There are other circumstances, says the professor, connected with evaporation, on which an hygrometer may be constructed; particularly the dilatation imparted to the air by the vapour, and the depression of temperature produced on the humid surface.

On the first of these he has invented an hygrometer consisting of a small tumbler, the mouth flat, having a hole ground through the bottom, in which is cemented a slender recurved tube, like a syphon, containing a portion of coloured oil. A few drops of water being put on a glass plate, and the tumbler being slipped upon this, the included air dissolves moisture proportional to its dryness; and the increased elasticity, thus communicated to the air, causes the column of oil in the tube to ascend. This instrument, however, requires address in its management, which renders it difficult to obtain with it results perfectly precise.

On the other principle, Mr. Leslie has constructed what

HYGROMETRY

he regards as the most accurate hygrometer. It is a happy application of the differential thermometer. One of the balls is coated with fine cambric paper, and the paper is moistened with pure water. Evaporation takes place; and, from the cold which accompanies this, the liquid falls in the opposite item. The extent of its descent is measured by the scale attached. This indicates the degree of cold; this, again, the extent of evaporation; and this, lastly, indicates the relative dryness of the air, the evaporation being proportionally greater as the air is more free from moisture. The full effect is very soon obtained—generally in about two minutes; and it continues permanent under the same circumstances, as long as moisture is supplied to the covered ball.

This ingenious author observes, in consequence of experiments adapted to the purpose, that the condition of the atmosphere, with regard to dryness, is extremely variable.

In our climate, the hygrometer will, during winter, mark from 5 to 25 degrees; but, in the summer months, it will generally range between 15 and 55 degrees, and may even rise, on some particular days, as high as 80 or 90 degrees. In thick fogs, the instrument stands almost at the beginning of the scale: it commonly falls before rain, and remains low during wet weather; but it mounts powerfully in continued tracts of clear and warm weather. The greatest dryness yet noticed was at Paris, in the month of September, when it reached to 120 degrees. But for want of observations, we are totally unacquainted with the real state of the air in the remote and tropical climates.

When the indication of the hygrometer does not exceed 15 degrees, we are directed by our feelings to call the air damp; from 30 to 40 degrees we begin to reckon it dry; from 50 to 60 degrees we should account it very dry, and from 70 degrees upwards we might consider it as intensely dry. A room is not comfortable, or perhaps wholesome, if it has less than 30 degrees of dryness; but the atmosphere of a warm occupied apartment will commonly produce an effect of upwards of 50 degrees.

Mr. Leslie has invented another instrument, which gives indications of the quantity of evaporation from a humid surface in a given time—which he has named the atometer. It consists of a thin ball of porous earthen-ware, two or three inches in diameter, with a small neck, to which is cemented a long and rather wide tube, bearing divisions, each of them corresponding to an internal annular section, equal to a film of liquid that would cover the outer surface of the ball, to the thickness of the thousandth part of an inch. To the top of the tube is fitted a brass cap, having a collar of leather, which, after the cavity has been filled with distilled or boiled water, is screwed tight, to prevent the transudation of the liquid from being so copious as to drop from the ball. Evaporation of the water takes place from the external surface, the instrument being suspended in the air; and the quantity evaporated in a given time, is discovered by the descent of the liquid in the tube. The use of this instrument will require some dexterity, particularly in adjusting the pressure of the collar; and its indications are slow,—but it may often be employed with advantage, where it is of importance to ascertain the actual rate of exhalation.

From a variety of observations on the subject of evaporation he infers, that air has its dryness doubled at each rise of temperature, answering to 15 centesimal degrees. Thus, at the freezing point, air is capable of holding a portion of moisture represented by 100 degrees of the hygrometer; at the temperature of 15 centigrade, it could

contain 200 such parts; at that of 30, it might dissolve 400; and at 45 on the same scale 800. Or, if we reckon by Fahrenheit's divisions, air absolutely humid holds, at the limit of congelation, the hundred-and-sixtieth part of its weight of moisture; at the temperature of 59 degrees, the eightieth part; at that of 86 degrees, the fortieth part; at that of 113 degrees, the twentieth part; and at that of 140 degrees, the tenth part. While the temperature, therefore, advances uniformly in arithmetical progression, the dissolving power which this communicates to the air mounts with the accelerating rapidity of a geometrical series.

The theory of the precipitation of rain, which he founds on this principle, requires, as he says, the assumption, not merely of the mixture of two masses of air at different temperatures, saturated with moisture, but the continued contact of two currents of air under these conditions; as it is thus only that a sufficient quantity of water will be furnished to form that copious precipitation which constitutes rain. And he adds a calculation, founded on the preceding law, which illustrates this, and illustrates exceedingly well, the general theory.

We shall here take occasion to observe, that as the capacity of air for heat is increased by its rarefaction, its disposition to hold moisture in solution appears to be increased by the same cause; and at the same time the removal of pressure, which is the consequence of the rarefaction, facilitates the transition of water into vapour. From these causes, if the hygrometer be suspended within a large receiver, from which a certain portion of air is quickly abstracted, it will sink with rapidity. But the effect is only momentary, for the rarefied air soon becomes charged with moisture, and consequently ceases to act on the wet ball of the thermometer. Hence there is every reason to believe that the higher regions of the atmosphere are drier than those beneath; and, without this condition, Mr. Leslie remarks, our globe must have been shrouded in darkness; for the cold which reigns in the upper strata, would have prevented the humidity from ascending to a great elevation, and have precipitated it in continual fogs or clouds. In the actual state of things, the diminution of temperature, in ascending, predominates at first over the augmented power of aqueous solution; and the air becomes damper till a height be reached, at which the opposite effects of cold and rarefaction are balanced. Above this, which is the proper region of the clouds, the influence of the rarity of the medium exceeds that of the cold, and the air therefore becomes progressively drier, until it melts away into the clear ethereal expanse.

On this principle is founded the very beautiful experiment invented by Mr. Leslie, of causing water to freeze by the cold produced by its own evaporation. The peculiar arrangement for this consists in placing water in a porous earthen cup, suspended within the receiver of an air-pump, and placing, at a short distance beneath it, sulphuric acid in a broad shallow vessel, so that an extensive surface of the acid shall be presented. On rarefying the air, the evaporation of the water is accelerated, and of course the degree of cold produced by that evaporation is increased. This, however, would soon be checked by the presence of the watery vapour; but this the sulphuric acid absorbs, almost as quickly as it is formed; keeps, therefore, the rarefied air always dry; and thus allows the evaporation to proceed with the same rapidity. The temperature, therefore, continues to fall, until the water shoots into crystals of ice; and even after it is entirely congealed, the ice continues to suffer evaporation, until it wholly disappears. See Leslie's Short

Account

Account of Experiments and Instruments, depending on the Relations of Air to Heat and Moisture, 8vo. Edinb. 1814. Edinb. Rev. N^o 48.

HYPERSTONE. See MINERALOGY, *Addenda*.

HYPOPHOSPHOROUS ACID. See PHOSPHORUS.

HYOSULPHUROUS ACID. See SULPHUR.

HYREUS, in *Ornithology*, a genus of birds of the order Passeres; the characters of which are, beak conic, straight

and ferrated; nostrils ovate; tongue short and obtuse; feet with three toes, two before and one behind. There is one species, *viz.* *H. Abyssinicus*, or black plant-cutter, with the head, throat, and jugulum red, wing-coverts brown, with white margin. It is found in Abyssinia, and, according to Mr. Bruce, it is a solitary species, and subsists on the kernels of almonds and other seeds, which it easily breaks with its strong ferrated beak. It frequents woods, and is called "Guifso batito dimmo-won jerck."

I and J.

JACKSON, l. 2, containing, together with its town Jefferson, 10,569 inhabitants, the slaves in the county being 1789, and in the town 27; l. 3, *r.* West Tennessee, adding—containing 5401 inhabitants, of whom 481 were slaves in 1810.

JACKSONSBOROUGH, l. 2, after Carolina, add—in Scriven county. At the close, add—containing 2663 inhabitants, of whom 2000 were slaves in 1810.

JAFFRAY, l. 4, *r.* 1336.

JAGHIRE, l. 7, after hereditary, add—There are two species of jaghire; one personal, for the use of the grantee; and the other, in fruit, for some public service, commonly for the maintenance of troops.

JAINA, l. *penult.* *r.* Myfore. Col. 2, l. 32, after Jainas, add—some say that; l. 34, after distinctions, add—others, however, assert, that they have the same fourfold division into classes or castes.

JAMAICA, in America, l. 8, after inhabitants, add—Alfo, a town of Windham county, in Vermont, having 996 persons.

JAMBAVANTA, l. 1, for Sui *r.* Sri; l. 5, for anantara *r.* avatara.

JAMES II. col. 3, l. 16, *r.* 5th.

JAMES City, l. 3, *r.* 4094 inhabitants, of whom 2320 were slaves in 1810.

JAMES, Sr. l. 5, after Chester, add—Alfo, a parish in the county of Acadia, in the territory of Orleans, containing 3935 inhabitants.

JAMESTOWN. Add—Alfo, a town of Newport county, in Rhode island, containing 504 persons.

JAVA, l. 24, after one, add—(See BANTAM.) At the close, add—See Raffles's Java.

JAY, l. 1, for Kennebeck *r.* Oxford; l. 7, *r.* 1107. Add—Alfo, a town of Orleans county, in Vermont, containing 28 inhabitants.

JAYADEVA, l. 5 from the bottom, for practical *r.* poetical.

JAYADEVI, l. 4, for Kari *r.* Kafi; l. 7, for Sina *r.* Siva.

JCE, col. 4, l. 43, add—clouds and frequent changes of wind being certain preventives of its formation; l. 44, Dr. Wells, in his Essay on Dew, &c. has given an account of

the process described by Mr. Williams, which, from its extent, 300 persons being employed in it, must have been carried on for profit, and of course would be conducted in the most economical manner. "A piece of ground, nearly level, containing about four acres, was divided into square plats, from four to five feet wide, which were surrounded by little mounds of earth, four inches high. In these inclosures, previously filled with dry straw, or sugar-cane haum, were placed as many broad, shallow, unglazed earthen pans, containing unboiled pump water, as they could hold. The air was generally very still, when much ice was formed; wind prevented its formation altogether. In the morning, between five and six o'clock, at which time alone, Mr. Williams made his observations, a thermometer, with its bulb naked, placed on the straw, amidst the freezing vessels, was never found by him lower than 35°; and he has observed ice, when a thermometer so placed was 42°. Another thermometer, suspended five feet and a half above the ground, was commonly 4° higher than that among the pans. It is possible, therefore, that Mr. Williams may have seen ice, a little before sun-rise, when the temperature of the air was 46°. But granting this were the fact, it would not hence follow, that the ice was formed, while the air possessed that heat. For, although the air is generally held to be in all countries colder about sun-rise than at any other time, I know, from my own observations, that this is not always the case in England; and similar exceptions may occur in Bengal."

The formation of ice in the circumstances above specified is ascribed by Sir R. Barker wholly, and by Mr. Williams in great measure, to cold produced by evaporation: and this opinion has been adopted by bishop Watson, Thompson, Young, Davy, and Lellie. Dr. Wells, however, is of opinion, that they have not fully considered the subject, alleging several reasons against it. He conceives, agreeably to his sentiments respecting the formation of dew (see Dew), that the formation of ice in Bengal depends upon the radiation of heat to the heavens. This cause, he says, not only exists, but exists in a degree sufficient for the production of the effect which he attributes to it. To this purpose he observes, that according to Mr. Leslie (on Heat, p. 80.) the power of water to radiate heat exceeds, perhaps, that of

all other substances. Ice, he adds, is chiefly formed in Bengal during the clearest and calmest nights; and on such nights the greatest cold, from radiation, is perceived on the surface of the earth. Moreover, the cold that produces this effect in Bengal appears, in its greatest degree, like cold from radiation in other substances, on those still and serene nights, during which little dew is deposited by the atmosphere. He further adds, that clouds and wind prevent the formation of ice in Bengal; and that the same itimes of the atmosphere either prevent, or considerably diminish, the occurrence of cold from the radiation of heat at night by bodies on the ground. From experiments, in procuring ice in the manner of Barker and Williams, Dr. Wells found reason for inferring, that water may freeze at night, in air of a temperature higher than 32° , not only without any loss of weight from evaporation, but with a gain of weight from an opposite process: and he concludes in general, that the formation of ice in Bengal, in the circumstances described by Barker and Williams, must be attributed, in by far the greater measure, if not altogether, to a loss of heat, which the water suffers by its own radiation, while situated in such a manner, that it can receive little heat from other bodies, either by radiation or conduction. Our author, in the course of his experiments, found, that evaporation from water of 32° produces very little cold, even in the day-time; and he thinks it much more probable, that on a clear and calm night, though in a dry winter of Bengal, water at the temperature of 32° will acquire warmth from the formation of dew upon it, than that it will become cold from evaporation.

ICHNEUMON. Add—The characters are, mouth with jaws, without tongue; antennæ with more than thirty joints; abdomen in most species foot-stalked; piercer exerted, with a cylindric-bivalve sheath. The animals of this genus deposit their eggs in the bodies of other living insects, and generally in those of caterpillars. Here they hatch, and the young larvæ, resembling small white maggots, nourish themselves with the juices of the unfortunate animal, and at length the young brood of ichneumon larvæ creep out by perforating the skin in various places, and each spinning itself up in a small oval silken case, changes into chrysalis, the whole number forming a group on the shrivelled body of the caterpillar which had afforded them nourishment, and, after a certain period, emerge in the state of complete ichneumons. The principal species are, *glomeratus*, *puperum*, *ovulorum*, *ramidulus*, *luteus*. See **VESPA**, and **WASP**.

ICHNOCARPUS, in *Botany*, Ait. Hort. Kew. v. 2. 69. See **ISCHNOCARPUS**.

ICTUS SOLARIS, *A Stroke of the Sun*, denotes the effect of a too violent influence of the sun upon the head. It is ranked by Dr. Cullen as a variety of apoplexy, under the name of "Carus ab insolatione."

IDA. Add—The summit of Ida is denominated *Gargaris*; and it affords a level surface, of no great extent, but of an oblong form, with a rudely-built wall around it, in which are small blocks of marble. This inclosure, it is conjectured, may have been a Greek church, or perhaps only a sheep-pen, united for the protection of the flocks in the summer months.

IDOCRASE. See **VESUVIAN**.

IDOLATRY, col. 5, l. 15 from the bottom, for even *r. ever*.

JEDBURGH. In 1811, the burgh and parish contained 669 houses, and 4454 persons; *viz.* 1957 males, and

2497 females: 399 families being employed in agriculture, and 405 in trade and manufactures.

JEFFERSON. (See **JACKSON**.)—Alfo, a county of the Mississippi, containing 4001 inhabitants, of whom 1792 were slaves in 1810.—Alfo, a township of Clarke county, in the Indiana territory.

JEFFERSON, in Kentucky, l. 3, r. 11,611; l. 4, r. 3746; l. 7.—It contains, together with Louisville, 6111 inhabitants, the slaves in the county being 2080, and in the town 256; l. 9, r. 7309 inhabitants, of whom 783 are slaves; l. 14, r. 197; r. 11 towns with 17,260 inhabitants, of whom 6001 are slaves; l. 14, after Steubenville, add—Alfo, a town of Adams' county, in Ohio, having 494 inhabitants.—Alfo, a town of Fayette county, in Ohio, having 327 persons.—Alfo, a township of Madison county, in Ohio, having 246 inhabitants.—Alfo, a township of Montgomery county, in Ohio, having 1343 inhabitants.—Alfo, a township of Mulingum county, in Ohio, having 962 persons.—Alfo, a township of Preble county, in Ohio, having 385 inhabitants.—Alfo, a township of Rois county, in Ohio, having 1456 inhabitants.—Alfo, a township of Scioto county, in Ohio, with 258 persons.—Alfo, a township of Geauga county, in Ohio, containing 168 inhabitants.—Alfo, a town in Maine, in Lincoln county, having 1205 inhabitants:—l. 16—Alfo, a county of Virginia, containing 11,581 inhabitants, including 3532 slaves; l. 17, for Grafton *r. Coos*, New Hampshire; *do. r.* 197; l. 19, after Scottville, add—Alfo, a county, containing 161 inhabitants.—Alfo, a township of Greene county, in Pennsylvania, having 1124 inhabitants.—Alfo, a county of New York, containing 15,140 inhabitants.

JERICHO, l. 4, r. 1185.

JERSEY, NEW, after the table, add—By the census of 1810, the whole number of its inhabitants is stated to be 245,562, and that of slaves 10,851. See each county, and **UNITED STATES**.

JESSAMINE, l. 2, r. 8219 and 2466.

JET. See **MINERALOGY**, *Addenda*.

JEW, col. 16, l. 9 from the bottom, *r.* 110,000.

JINJAL, denotes a large mulket, fixed on a trivet, used in Indian forts, and fired with great precision.

JLCHESTER, l. 4 from the bottom, *r.* 1811—83—610.

ILEUM. See **INTESTINE**.

ILFRACOMBE, l. *ult. r.* 434 and 1934.

ILLINOIS. Add—The Illinois territory, now one of the United States, contains two counties, *viz.* St. Clair and Randolph: the former comprehending nine townships, and the latter four; and the number of inhabitants in the whole territory is stated, by the census of 1810, to be 12,282 persons, of whom 168 were slaves. See **UNITED STATES**.

ILLORI, a town of Mingrelia, on the left bank of the Enguri, surrounded by a wall.

ILMINSTER. By the return in 1811, the parish contained 364 houses, and 2160 persons; *viz.* 1022 males, and 1138 females: 121 families being employed in agriculture, and 231 in trade, manufactures, and handicraft.

ILSLEY, l. 2, and East and West Ilsley were returned to parliament, in 1811, as containing 179 houses, and 996 persons.

IMIRETTA, l. 8, after *W.* add—between the 43d and 44th degrees of N. lat.

IMPDIMENTS, in *Elocution*. See **LARYNX**, and the references under that article

IMPERATA, in *Botany*, so called after Ferrante Imperato,

perato, a Neapolitan botanist of the 16th century. See SACCHARUM, n. 15.

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INCUBATION, *dele* the account of the figures.

INDEPENDENCE, in *Geography*, a town of Suffex county, in New Jersey, containing 1224 inhabitants.

INDIANA. After the table, add—According to the census of 1810, Indiana is divided into five counties, *viz.* Dearborn, having 7310 inhabitants; Clark, with 5670; Harrison in two divisions, having in one 2338, and in the other 1257 inhabitants; and Knox in two cantons, one having 4097, and the other 3848. See UNITED STATES.

INDIANA, in Pennsylvania. Add—Indiana contains nine townships, and 6214 inhabitants.—Also, a township of Alleghany county, in Pennsylvania, containing 692 inhabitants.

INDICATOR, *Honey-guide*, in *Ornithology*, a peculiar genus formed of the *CUCULUS Indicator*; the characters of which are, beak strong, conic, dilated at the base, narrow towards the tip, the upper mandible bent and carinated, the lower one recurved at the tip; nostrils slightly covered with feathers, feet simple, with two toes before and two behind. The external hinder toe longest, armed with a stout claw. See *CUCULUS*, and for Dr. Sparman's account of it, Phil. Transf. vol. lxvii. p. 38.

INDIGO, *Chemical Properties of*. The indigo of commerce is exceedingly impure, and seldom contains more than half its weight of real indigo. Thus, Bergmann could only obtain 47 per cent. of real indigo from the purest specimen he could procure; and more lately Chevreul from the best guatemala could only obtain 45 per cent. The following analysis of Chevreul will give some idea of the substances with which the indigo of commerce is adulterated.

Substances separated by water	}	Ammonia	
		Dioxygenised indigo	12
_____ alcohol	}	Green matter	
		Bitter matter	
_____ muriatic acid	}	Green matter	30
		Red matter	
_____ acid	}	Indigo	
		Red matter	6
_____ acid	}	Carbonate of lime	2
		Oxyd of iron and alumina	2
_____ acid	}	Silica	3
		Pure indigo	45
			100

The principal properties of indigo have been already detailed. The effects of nitric acid upon indigo, however, as ascertained by Mr. Hatchett, have been omitted, and are so interesting that they deserve to be mentioned.

Nitric acid acts on indigo with great violence, so as even to set fire to it when concentrated, as was long ago observed by Woulfe. When the acid is dilute, the action is less violent. Mr. Hatchett, however, found, that when diluted with an equal quantity of water, the action of the acid was still so violent as to require further dilution. When the effervescence had nearly subsided, the liquid was placed on a sand-bath for some days, and evaporated to dryness. Water poured upon this residuum dissolved a considerable portion of it, and formed a beautiful deep yellow solution of an intense bitter taste. This solution contains only a very

small portion of oxalic acid; but with a solution of isinglass it forms a copious yellow insoluble precipitate, and hence contains a portion of artificial tannin; with ammonia, crystalline precipitate, consisting of *bitter principle* combined with ammonia.

When four parts of nitric acid are poured upon one part of indigo, the pigment soon loses its colour, and is dissolved. The solution becomes yellow, and a thin layer of a resinous-like substance appears on the surface. This substance becomes solid on cooling if the process be now stopped. If it be removed, and the solution be evaporated to the consistence of honey, redissolved in hot water and filtered, potash throws down yellow spicular crystals, consisting of *bitter principle* combined with potash. These crystals have the property of detonating with a purple light when wrapped up in a paper, and struck with a hammer; the resin by treating it with nitric acid may be converted into the same bitter principle. If the process be stopped sooner than the point above-mentioned yellow crystals are obtained, which on sublimation become white, and appear to possess the properties of benzoic acid. Thus it appears, that by treating indigo with nitric acid, it is converted into tannin, oxalic acid, benzoic acid, and *bitter principle*.

INDRA, col. 2, l. 32 and 33, read thus, without a break, and omitting *INDRA Malwa*,—Malwa, the hereditary possession, &c.

INDUSTRY, in *Geography*, a township of America, in Maine, county of Somerset, having 562 inhabitants.

INFLAMMATION of the Breast. See BREAST, *Inflammation of*, in the *Addenda*.

INGA, in *Botany*, an American name, recorded by Marcgraave, and adopted by Plumier. It was sunk in *Mimosa* by Linnæus; but Humboldt and Bonpland having separated from thence the original genus of Plumier, have retained the appellation he had chosen, and they are followed by Willdenow, as well as by Brown and Aiton in *Hort. Kew*. If any barbarous name be tolerated, and they can hardly be all expunged, the present is unexceptionable.—Plum. Gen. 13. t. 19. Willd. Sp. Pl. v. 4. 1004. Ait. Hort. Kew. v. 5. 451.—Class and order, *Polygamia Monœcia*; rather *Monadelphæa Polyandria*. Nat. Ord. *Lomentaceæ*, Linn. *Leguminosæ*, Juss.

Ess. Ch. Calyx five-toothed. Corolla tubular, five-toothed. Stamens united into a cylindrical tube. Legume of one cell. Seeds imbedded in pulpy tunics. Some flowers without a pistil.

Obs. If *Mimosa* be divided at all, the present numerous genus may commodiously be separated from it, though the *inflorescence*, and structure of the *flowers*, come, in many instances, very close to *ACACIA*; see that article, as well as *MIMOSA* and *DESANTHUS*. From the last, *Inga* is truly distinct, in having monadelphous indefinitely numerous *stamens*, no neuter, though many male, *flowers*, and in every instance a very different *fruit*. The greater size of the *leaflets* is characteristic of *Inga*, and they are, for the most part, differently compounded from those of the other genera. Willdenow enumerates fifty-eight species, some of them truly superb in their *flowers*. We shall give examples of this writer's six sections. The leaves of this whole genus are compound; none of them feative.

SECT. 1. *Leaves twice yoked*. Eleven species.
I. dulcis. Sweet Inga, or Sappan Fruit. Willd. n. 3. Ait. n. 1. (*Mimosa dulcis*; Roxb. Corom. v. 1. 67. t. 99.)
 —Thorns stipular, straight. Leaflets elliptic-oblong, somewhat pointed. Footstalks with three glands. Cluster compound, terminal. Flowers capitate. Legume twisted.
 —Native of the Philippine islands. Cultivated on the coast

of Coromandel, for the sake of its sweet pulpy red fruit, which is six inches long, wholesome, though rather insipid. *Flowers* small, white.

SECT. 2. *Leaves thrice yoked.* Five species.

I. tergemina. Martinico Inga. Willd. n. 12. (*Mimosa tergemina*; Linn. Sp. Pl. 1499. Jacq. Amer. 265. t. 177. f. 81. *Acacia frutescens*, &c.; Plum. Ic. 5. t. 10. f. 1, the Linnæan characters transposed in the plate.)—Thorns none. *Leaflets* obovate, obtuse; glaucous beneath. Tufts of flowers on solitary axillary stalks. Legume straight.—Native of Martinico. *Leaflets* an inch long, oblique. *Flowers* purplish.

SECT. 3. *Leaves pinnate; common stalk winged.* Thorns none. Twelve species.

I. vera. Common Inga. Willd. n. 17. Ait. n. 3. (*Mimosa Inga*; Linn. Sp. Pl. 1498. Inga flore albo fimbriato, fructu dulci; Plum. Ic. 14. t. 25. Arbor; Merian. Surin. t. 51.)—*Leaflets* about five pair, ovate-oblong, pointed, smooth, with a gland between each pair. Corolla hairy. Legume furrowed, downy.—Native of South America and the West Indies, where the legumes are esteemed for their agreeable sweets.

I. fastuosa. Stately Inga. Willd. n. 25. (*Mimosa fastuosa*; Jacq. Fragn. 15. t. 10.)—*Leaflets* about four pair, ovate, pointed; hairy beneath; with a stalked gland between each pair. Corolla hairy. Legume hairy, compressed, twisted.—Native of the Caraccas. We have from Dr. Martier a fine dried specimen, such as that from which Jacquin's plate is taken. This is a truly magnificent plant, whose copious large tawny flowers, with long crimson stamens, make a splendid appearance. The *leaflets* are from two to five inches long. Legume broad, flat, but containing a sweet pulp, with large oval seeds.

SECT. 4. *Leaves pinnate; common stalk simple.* Thorns none. Ten species.

I. nodosa. Knobbed Inga. Willd. n. 29. Ait. n. 6. (*Mimosa nodosa*; Linn. Sp. Pl. 1498. *Phaseolus arborescens*, &c.; Pluk. Phyt. t. 211. f. 5.)—*Leaflets* two pair, ovate-oblong, smooth, unequally divided by the rib; the lower ones smallest, with a gland between.—Found in Ceylon and Cochinchina. It appears to have been raised in the English and Dutch hoves, but not preserved. The *leaflets* are from one to two inches long, their two sides very unequal.

SECT. 5. *Leaves conjugate, pinnate.* Nine species.

I. purpurea. Purple Inga, or Soldier-bush. Willd. n. 42. Ait. n. 8. (*Mimosa purpurea*; Linn. Sp. Pl. 1500. Andr. Repol. t. 372. *Acacia frutescens*, &c.; Plum. Ic. 6. t. 10. f. 2, the Linnæan character misapplied.)—*Leaflets* four pair, obovate, obtuse; unequal at the base. Footstalks without glands. Heads of flowers stalked.—Native of the West Indies. The *leaflets* are half an inch long, smooth. *Flowers* copious, very conspicuous for their long tassels of crimson stamens.

SECT. 6. *Leaves doubly pinnate.* Eleven species; some thorny.

I. Saman. Great Downy-leaved Inga. Willd. n. 49. (*Mimosa Saman*; Jacq. Fragn. 15. t. 9.)—Thorns none. Leaves with six pair of primary divisions; leaflets five or six pair, elliptic-obovate, obtuse; terminal ones unequal-sided; all downy beneath as well as their stalks.—Native of the Caraccas. One of the largest and stoutest trees of the *Mimosa* tribe. *Leaves* two feet, or more, in extent, with a depressed gland at every subdivision. Legume flat, seven or eight inches long.

INGATESTONE, l. 5, r. 98 and 640.

INSTITUTE, NATIONAL, &c. col. 2, after line 6,

add—By a royal edict, passed the 26th of March, 1816, the first class resumes the name of the Royal Academy of Sciences, preferring the organization and distribution in sections.

INVERARY, col. 2, l. 8 and 7 from bottom, r. 103 and 1113.

INVERKEITHING. Add—The burgh and parish of Inverkeithing, by the last returns in 1811, contained 581 houses, and 2400 persons.

INVERNESS, col. 2, l. 7, 8, 9, r. The burgh and parish was returned, under the act of 1811, as containing 1672 houses, and 10,757 inhabitants.

INVERNESS-SHIRE, l. 10 and 11, r. comprehended, in the year 1811, 78,336 persons, occupying 14,646 houses; 35,722 being males, and 42,614 females.

INVERURY. In 1811, the burgh and parish contained 205 houses, and 907 persons; 453 being males, and 454 females.

INULIN, in *Chemistry*, a name given by Dr. Thomson to a substance extracted by Rose, from the *Inula helenium*, or Eleccampne. This substance is extracted by boiling the roots in water, and putting by the decoction to cool, when the inulin is deposited in the form of a white powder. Inulin resembles starch in its appearance, and some of its properties. It is principally distinguished from starch by separating from water after boiling in the form of a white powder. Inulin has been found by Dr. John in the roots of several other plants.

IOANNA. Add—In 1809, this island was visited by the savages of Madagascar, called Malagascars, who laid siege to the principal town, and destroyed the crops, and thus reduced the inhabitants to the most deplorable state, so that nearly 200 women and children perished of hunger, and numbers of the latter were actually eaten by their parents, so that these savages have nearly desolated the Comora islands. The once happy and flourishing island of Ioanna, with its 370 towns and villages, so enchantingly described by sir William Jones, is now reduced to two walled towns, and a population of 5000 souls.

IOANNINA, a city of Albania, the capital of Ali's dominions, situated on the western banks of a lake of the same name, at about two miles from its eastern extremity. In its utmost length, it may be, perhaps, about two and a half miles, and in breadth nearly a mile. Near the lake it stands on a flat, but the northern and western parts are built on slopes of rising and uneven ground. A triangular peninsula juts into the lake, and contains the residence of the pacha, being defended by a fortification at each angle. The entrance into these forts is over a draw-bridge. There is one street which runs nearly the whole length of the town, and another that intersects it at right angles, extending to the fortrefs; these are the principal streets. Many of the houses are large and well built, containing a court-yard, and having warehouses or stables on the ground, and the apartments of the family above. A flight of wooden steps and a gallery connect the under and upper parts of the houses. Although gloomy in appearance, with small windows latticed with cross bars of wood, the yard is furnished with orange and lemon trees; and the best houses communicate with a garden, and the galleries are sufficiently spacious to allow scope for walking in rainy weather. The bazaar, or principal street, inhabited by tradesmen, has a showy appearance; the bizen, or covered bazaar, is of considerable use, and would put one in mind of Exeter Change in London. Beside the palace of the pacha, and two houses allotted to the sons of Ali, there is another summer residence of the vizier's in the suburbs, at the N.W. end of the town. Beyond the pavilion,

pavilion, there are gardens belonging to the principal inhabitants of Ioannina, most of whom have summer-houses. The population is variously stated: some compute the number of houses at 8000, and others estimate the number of inhabitants at no more than 35,000. From the commercial transactions of this city, the vizier draws a revenue of 250,000 piastres. Hobhouse's *Journey through Albania, &c.*

IODATES, IODIC ACID, IODIDE, in Chemistry. See **SIMPLE Bodies.**

IODINE. This newly discovered elementary substance has been correctly described under **SIMPLE Bodies**, to which, therefore, we refer our readers.

JOHN of Gaunt, l. 2, r. for third r. fourth.

JOHN BAPTISTE, in Geography, a parish of German Coast county, in the territory of Orleans, containing 2990 inhabitants.

JOHNSBURY, St., l. 3, r. 1330.

JOHNSON, l. 2, r. 4867; l. 3, r. 2330. Add—Alfo, a town of Franklin county, in Vermont, having 494 inhabitants.

JOHNSTON, l. 3, r. 1516. *Delete* the last paragraph, and insert—See **JOHNSON.**

IOLITE. See **MINERALOGY, Addenda.**

JONES, l. 3, r. 4968 inhabitants, of whom 2375 were slaves in 1810.—Alfo, a county of Georgia, which, with its town Clinton, contains 8597 inhabitants; the number of slaves belonging to the county being 2574, and to the town 63, in 1810.

JONESBOROUGH. Add—a township of Washington county, in Maine, having 553 inhabitants.

JOSEF, St., l. 16, r. Tucuman.

IPECACUANHA, l. 33, add—The plant is now known to be the **CALLICOCA.**

IPECACUANHA, Chemical Properties of. See **EMETIN.**

IPSWICH, l. 6.—In the year 1811, by the parliamentary returns, it contained 2732 houses, and 13,670 persons.

IRA, a town of Rutland county, in Vermont, having 519 inhabitants.

IRAC, l. 17, after wine, add—This province is divided into five great districts, and each of these into hallooks, or lesser districts. The five districts are, Ispahan, Tehraun, Naen, Mullagar, and Kermanshaw. See each. At the close, add—See **YEZD, KOM, TEHRAUN, &c.**

IRAVAT, l. 15, for thunder, bearer r. thunder-bearer.

IREBY. In 1811, the parish, comprehending High and Low Ireby, contained in the former township 26 houses, and 130 persons, *viz.* 62 males, and 68 females; and in the latter, 41 houses, and 269 persons, *viz.* 137 males, and 132 females.

IRIDIUM. See **MINERALOGY, Addenda.**

IRITIS, or Inflammation of the Iris. Professor Schmidt, of Vienna, first accurately discriminated this disease from other kinds of ophthalmia, and applied to it the foregoing name. The iris often becomes inflamed in consequence of artificial or accidental wounds of the eye-ball. Constitutional syphilis frequently affects the eye, producing a peculiar and characteristic iritis. The iris is the texture, which is the seat of inflammation in the distinct kind of ophthalmia so frequently met with in gouty constitutions. In the rheumatic ophthalmia, the inflammation, though never originating in the iris, frequently extends to it. And, lastly, an inflammation of this membrane sometimes accompanies cutaneous eruptions; particularly those which, though not syphilitic, have succeeded sores of the genitals, and are generally supposed to be connected with the abuse of mercury.

1. In common inflammation of the iris, or *idiopathic iritis*,

besides the common symptoms of ophthalmia, there are changes which occur at the very commencement that indicate the seat of the inflammation. The pupil is contracted, the motions of the iris are less free, and the pupillary opening loses the bright black colour which it naturally possesses. The colour of the iris is next observed to alter; this happens first in the lesser circle, which gets of a darker hue; and afterwards in the greater, which grows green if it has been greyish or blue, and reddish if it has been brown or black. The iris afterwards swells and projects towards the cornea; and the margin of the pupil loses its sharply defined edge, and is turned back towards the posterior chamber. The redness accompanying these changes is by no means considerable, and is at first confined to the sclerotic coat, in which a number of very minute rose-coloured vessels are seen running in straight lines towards the cornea. The pupil, at the same time, loses its circular form, becomes somewhat irregular, and presents a greyish appearance. Examined with a magnifying glass, this appearance is seen to be produced by a substance very like a cobweb, occupying the pupil, and which is soon afterwards distinguished to consist of a delicate flake of coagulable lymph. Into this, the processes or dentations of the margin of the pupil seem to shoot, and it is afterwards found, that at these points adhesions are apt to be established, in consequence of which vision is rendered more indistinct, and only one side or parts of objects can be discerned.

The effusion of lymph into the pupil continues to increase; it is likewise poured into the posterior chamber, and adhesions between the iris and capsule of the lens are formed. The quantity of lymph effused is sometimes so great, as to fall in a curdled form from the pupil to the lower part of the anterior chamber. The pupil, the size of which is considerably diminished, now derives a greyish-white colour from that of the lymph by which it is filled; the morbid sensibility to light, which prevailed at the commencement of the inflammation, is diminished; the powers of vision become gradually more and more limited; and, at length, merely the perception of light remains.

By this time, the redness of the eye has increased, and partly arises from vessels which are now developed in the conjunctiva. The redness is deepest all around the cornea; towards the periphery of the eye-ball it fades. The cornea loses somewhat of its peculiar brilliancy; and lymph now appears to be effused into the substance of the iris; for, while it projects more and more towards the cornea, its fibres are collected into bundles, and its surface exhibits a puckered or plaited appearance. A yellowish-red tubercle then forms on some part of its surface; it is at first small, but enlarges and projects forwards, and, according to Schmidt, is distinctly seen to be an abscess, which finally bursts, and discharges its contents into the anterior chamber. At this period of the disease, a small quantity of blood is sometimes extravasated into the anterior chamber. The inflammatory symptoms now abate, and, as the disease subsides, both the pus and blood in the anterior chamber are absorbed. The shreds of the cyst of the abscess, which were floating in the aqueous humour, in a few days disappear. The anterior chamber regains its transparency; the iris remains permanently expanded; its puckered appearance continues, the pupil is closed, and the power of vision is entirely lost. When the termination is somewhat more favourable, the pupil is not entirely closed, and the iris retains some degree of motion. The piece of coagulable lymph which occupies the pupil is reduced to the state of a thin membrane, which is opaque towards its centre, but somewhat transparent at the edges; the margin of the iris is only adherent

IRITIS.

at some points to this membrane; and vision is impaired, but not destroyed.

Sometimes the inflammation of the iris extends to other textures of the eye. When the cornea is attacked, it becomes cloudy and thickened; and the iris projecting, the two inflamed textures come into contact, and adhere before any visible effusion of lymph takes place. Should the inflammation spread more deeply, and attack the membranes of the lens, and of the vitreous humour, the choroid coat, &c. then the violent symptoms of deep-seated inflammation of the eye take place. Even if the form of the organ is preserved, vision is totally destroyed; but often the eye suppurates, bursts, and almost entirely disappears.

In the *Syphilitic Iritis*, a pale redness all round the cornea is the first symptom which is perceived. It is at first seated in the sclerotic coat alone; but the conjunctiva very soon shares in it, and afterwards becomes even redder than the preceding membrane. However few the vessels may be elsewhere, there is always a broad zone of them all round the cornea, a zone formed at this place, not only by the vascular net-work in the conjunctiva, but by the ciliary vessels on the external surface of the sclerotic. The redness has a peculiar tint; for instead of being bright red, it is brownish, something like the colour of cinnamon. The whole cornea becomes uniformly hazy. The pupil also becomes contracted, and the iris limited in its motions, as in common iritis; but the pupil does not preserve its natural situation. It is removed in a direction upwards and inwards towards the root of the nose, and is irregular. At the same time, the iris loses its natural colour, and projects forwards.

Towards evening, there is always an aggravation of the symptoms; the intolerance of light and painful sensibility of the whole eye increasing, and a gush of tears following every change of light and temperature. At length, a regular nightly pain sets in, of an extremely severe kind, but strictly limited to that part of the cranium which is immediately above the eye-brow. It usually begins between six and seven in the evening, gradually increases, reaches its utmost height about midnight, and then diminishes till about four or five in the morning, when it ceases. After every such attack of pain, the pupil is found more contracted, drawn farther upwards and inwards, the iris more altered both in colour and form, the quantity of lymph increased, and consequently vision more impeded.

Peculiar appearances then take place in the iris; for, either on its pupillary or ciliary margin, or on both, one or more reddish-brown tubercles arise, which have a spongy look. Their growth is pretty rapid. Lardy-looking ulcers sometimes appear on the cornea and white of the eye, or on the eye-lids. Even when syphilitic iritis terminates in the most favourable manner, the eye for a long time afterwards is peculiarly sensible to the influence of cold and moisture. On every exposure to these, the organ becomes morbidly sensible to light, of a reddish colour, and discharges tears. Indeed, frequently for more than a year afterwards, on every sudden change of temperature, a pale violet-coloured zone appears around the cornea, but goes off when the eye has remained for some time exposed to an equal temperature.

In the iritis which appears in conjunction with the eruptions supposed to be connected with the abuse of mercury, the inflammation seems less active than in the other kinds. The pupil is not much contracted, and lymph is less apt to be effused. A vesicle full of yellow matter sometimes rises on the iris, without any other alteration on this membrane than that of colour, the pupil remaining almost unchanged. By the use of proper remedies, this vesicle, even when it seems quite ready to burst, can generally be made

to disappear in a few days, without any rupture taking place. The blood-vessels of the conjunctiva are large and dilated, without being varicose; they have a more livid colour than in the iritis of arthritic persons, and run quite to the edge of the cornea.

The treatment of iritis is conducted on the same principles as that of inflammation in general, with one difference, which is deduced from the important fact so well explained by Dr. Farre and Mr. Travers, *viz.* that in iritis, the free exhibition of mercury is the most effectual means of preventing the effusion of coagulating lymph, and promoting its absorption after it has taken place, from which effusion the thickening and adhesions of the iris, the formation of opacities in the pupil, and other mischievous and destructive effects upon vision, are principally derived. According to Mr. Travers, indeed, whatever may be the cause of iritis, mercury is the grand remedy for resisting the progress and consequences of the effusion of lymph in the eye. According to professor Schmidt, of Vienna, general bleeding is necessary only where there is a great degree of symptomatic inflammatory fever. Hence, it is principally in the idiopathic iritis that large bleedings from the arm are requisite. In the syphilitic species, he says, it is never necessary to open a vein. In the arthritic, it is sometimes attended with benefit; but in patients of this description, a small bleeding, repeated next day if necessary, is found to answer much better than a large bleeding at once, even though the constitutional disturbance be considerable. In the *rheumatic iritis*, it is also sometimes highly beneficial to bleed from the arm. Local bleeding, by means of leeches to the forehead, produces the most decided benefit in all the varieties of iritis.

Purgatives, given so as to act copiously, professor Schmidt describes as being useful only in the idiopathic iritis; and as for cold local application, he tells us that they are in all cases quite useless.

In the idiopathic iritis, he recommends us to take sixteen or twenty ounces of blood from the arm; and to repeat the bleeding if circumstances should require it. Six or eight leeches are to be applied to the eye-brow or temple. A smart purgative should then be given. The application of leeches, but in smaller number, should be continued every day, or every other day, until an abatement of the inflammation has evidently taken place. In the first stage of the process, blisters to the temple, or behind the ears, have little or no effect; though sometimes a large one on the nape of the neck seems to be of service. According to Schmidt, the only topical treatment which is admissible is the fomentation of the eye with water made as hot as the patient can bear it, which sometimes procures a mitigation of the violence of the pain. Care, however, must be taken to dry the eye-lids and circumference of the orbit well after using this application.

When the disease passes into its second stage, or that in which the effusion of coagulating lymph commences, mercury is to be given with the views already mentioned. Two grains of the submuriate of mercury, and half a grain of opium, made into a pill, are to be given every evening and morning; or common mercurial frictions may be employed. Externally, professor Beer applies a solution of the oxymercurate of mercury in water, to which mucilage and a considerable quantity of the vinum opii have been added. When this collyrium loses its effect, or the eye cannot bear any fluid application, which is sometimes the case, then he inserts daily between the eye-lids a small quantity of a false copiate of two drachms of fresh butter, six grains of red precipitate, and eight grains of extract of opium. According

to the same eminent oculist, frictions once a day over the eye-brow with mercurial ointment, opium being added to it, very much contribute to the absorption of the lymph effused in the posterior chamber.

It is seldom necessary to continue many days the exhibition of mercury; for such is the efficacy of this mineral in producing a removal of the lymph, and clearing away all opacities about the pupil, that in less than eight or ten days these objects are generally effected, and the medicine then may be omitted.

The form of iritis, usually named *syphilitic*, is unquestionably one of those diseases which does not require more mercury for its cure than the common idiopathic iritis; and although it was supposed by professor Schmidt that it could not be radically cured without removing the constitutional disease, modern experience fully proves, that it may often be entirely and permanently relieved by freely exhibiting mercury for only a few days. This is another fact tending to confirm the opinions which have recently been examined and promulgated with so much ability by several of our army surgeons, in relation to the curability of all the forms of syphilis without mercury. For, even in the syphilitic iritis, we are not to imagine that the complaint is stopped and cured by a few grains of calomel, on the principle of eradicating a specific disease: the thing is more rationally explained by the peculiar efficacy of the medicine in producing an absorption of the lymph, which thickens the iris, obstructs the pupil, and even serves for the formation of preternatural adhesions, and new opaque membranes destructive of vision. Besides the use of mercury, however, other means are advisable. When there is severe pain in the eye with violent head-ache, three or four leeches should be applied on the eye-brow, and a mild purgative administered. The nightly attacks of pain, which are so invariably followed by an aggravation of all the symptoms, are most effectually prevented by rubbing into the part just over the eye-brow a small quantity of mercurial ointment with opium, a short time before the pain is expected to begin, and then covering the eye with a folded piece of warm linen. Generally speaking, calomel given in small doses two or three times a day, is the best preparation of mercury for internal exhibition.

The *iritis* which accompanies cutaneous eruptions was thought by Schmidt to be the most easy of cure; local bleedings are said to be in this case strikingly beneficial. According to some writers, when the eruptions have arisen from the previous abuse of mercury, calomel has not the least effect on the accompanying iritis. But at the London Infirmary for diseases of the eye, this form of the disease, though originally it may have been caused by the effects of a mercurial course, is said to be benefited as much as the other varieties of iritis by the exhibition of mercury; a circumstance which no mode of reasoning would ever have led us to anticipate. If, however, it be an unequivocal fact, the voice of experience must direct us in practice, and we must be silent on things which we cannot explain.

The best account of iritis is contained in professor Schmidt's valuable work, entitled "Ueber Nachstaar und Iritis nach Staar-Operationen," 4to. Wien. 1801. Additional information is also published in Beer's "Lehre von den Augenkrankheiten," b. i. p. 450. Wien. 1813. Saunders on Diseases of the Eye, edit. 3. by Dr. Farre; B. Travers, in "Surgical Essays," part i. Carmichael in "Observations on the Symptoms and Specific Distinctions of Venereal Diseases," 8vo. 1818. The Quarterly Journal of Foreign Medicine, N^o 1. contains a well-written analysis of professor Schmidt's work on Iritis; and at the same time that we

acknowledge our obligations to that periodical publication for every thing which is valuable in this article, we cannot refrain from expressing our best wishes for the success of a journal, the principal object of which is to make us acquainted with the contents of all the best modern books which appear on the subject of medical science in different parts of the continent.

IRON, in *Chemistry*. According to the recent determination of Dr. Thomson, the black or protoxyd of iron is a compound of

Iron	-	-	-	100.
Oxygen	-	-	-	28.5

Hence the weight of the atom of iron will be 35. The red or peroxyd of iron, according to the same chemist, is a compound of

Iron	-	-	-	100.
Oxygen	-	-	-	42.955

Or it is composed of 1 atom iron + $1\frac{1}{2}$ atoms oxygen, or, to get rid of fractions, of 2 atoms iron + 3 atoms oxygen, on which latter supposition the weight of an atom of peroxyd will be 100.

IRON-CLAY. See **MINERALOGY**, *Addenda*.

IRON-FLINT. See **MINERALOGY**, *Addenda*.

IRON, Meteoric. See **MINERALOGY**, *Addenda*.

IRON-SAND. See **MINERALOGY**, *Addenda*.

IRON-STONE, Iron-Ore. See **IRON-STONE**, and **MINERALOGY**, *Addenda*.

IRON-STONE, Magnetic. See **MINERALOGY**, *Addenda*.

IRVINE, col. 2, l. 12, r. In 1811, the burgh and parish contained 694 houses, and 5750 inhabitants.

IRWIN, a township of Venango county, in Pennsylvania, having 357 inhabitants.

ISAURIA, l. 1, for town r. country.

ISCHNOCARPUS, in *Botany*, from *ισχυος*, slender, and *καρπος*, fruit.—Brown Tr. of Vern. Soc. v. 1. 61. Ait. Hort. Kew. v. 2. 69.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Contorta*, Linn. *Apocinea*, Juss. Br.

Eff. Ch. Follicles two, thread-shaped, divaricated. Seeds hairy at the top. Corolla valver-shaped; throat naked. Anthers not attached to the stigma.

1. *I. frutescens*. Ait. n. 1. (*APOCYNUM frutescens*, see that article, n. 7. Burm. Zeyl. t. 12. f. 1.)—The only species.

ISLE OF WIGHT. At the end, add—By the parliamentary returns in 1811, the Isle of Wight contained 4323 houses, and 24,120 persons; 11,955 being males, and 12,165 females.

ISLE of Wight, in America, l. 3, r. containing 9186 inhabitants, of whom 4041 were slaves in 1810.

ISLEBOROUGH, l. 5, r. 583.

ISLEWORTH, l. 20, add—By the parliamentary returns in 1811, the parish contained 775 houses, and 4661 persons.

ISLINGTON, col. 2, l. 15, r. 1811—15,065—2399.

ISOCHILUS, in *Botany*, *ισος*, equal, and *χιλος*, a lip, from the proportion of that part to the calyx and petals.—Brown in Ait. Hort. Kew. v. 5. 209.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideae*.

Eff. Ch. Lip nearly similar to the converging petals and calyx. Anther a moveable deciduous lid. Masses of pollen four, parallel.

1. *I. linearis*. Ait. n. 1. (*Epidendrum lineare*; Jacq. Amer. 221. t. 131. f. 1.)—Spike terminal. Leaves linear, emarginate. Stem simple.

2. *I. prolifer*. Ait. n. 2. (*Cymbidium proliferum*; Willd. Sp. Pl. v. 4. 95.)—Flowers axillary. Leaves lanceolate-oblong. Stem proliferous, with axillary two-leaved bulbs.—Both species grow in the West Indies.

ISRAEL, in *Geography*, a township of Prebble county, in Ohio, having 394 inhabitants.

JUBILEE, l. 13, for thirty-five *r.* thirty-three.

IVES, St. l. *penult.* *r.* 1811—712—3281 persons, in the borough and parish.

IVES, St. l. 4 from the end, *r.* 1811—2426—474.

JULFA. See ZULPHA.

JULIEN, St. l. 3, *r.* Saulnic.

JUNGLE, denotes, particularly in India, a wood or thicket, in a country overrun with shrubs or long grass.

JUNIATA, in *Geography*, a township of Cumberland county, in Pennsylvania, having 1233 inhabitants.

IXODIA, in *Botany*, from *ἰξόδιον, viscid.*—Brown in Ait. Hort. Kew. v. 4. 517.—Class and order, *Syngenezia Polyg.-aqualis*. Nat. Ord. *Compositae*.

Eff. Ch. Recept. chaffy. Seed-down none. Calyx imbricated; inner scales radiating, coloured.

1. *I. acillioleides*. Ait. n. 1.—Native of the fourth coast of New Holland. A green-house shrub, flowering most part of the year.

K.

KAMA, col. 2, l. 3 from bottom, for *magry* *r.* *mogry*.
KAMAL, *dele* l. 2, 3, and 4 from the bottom.

KAMAWKA, in *Geography*, a county of Virginia, containing 3366 persons, of whom 352 were slaves in 1810.

KARLY, col. 2, l. 8, for ball *r.* bafe; l. 15 from bottom, for as *r.* or.

KARPOOT, a large and ancient town in the pachalic of Diarbekr, built on the summit of a hill, at the western extremity of a fertile valley, about three or four miles broad, and from twenty to twenty-five miles long.

KASAWAGO, a township of Crawford county, in Pennsylvania, having 384 inhabitants.

KASHEKA, for *Vishnavitra* *r.* *Vishwamitra*.

KASI, l. 4, for nari *r.* nafi.

KASKASKIAS, l. 5, *r.* 622, and 48.

KASYAPA, l. 7, for all *r.* ufe.

KAYKIYA, l. 4, for Lucins, his half brother *r.* twins, his half brothers.

KAZAMEEN, a town of Persia, in the pachalic of Bagdad, three miles north of Bagdad, and on the western bank of the Tigris, inhabited by about 8000 Persians, who reside here because this town is the burying-place of Imam Moufa Cassim, and Inam Mahomet Tonky, holy men for whom they had great respect, and to whose memory a noble mosque is erected. About nine miles north-west of Kazameen, and at some distance from the river, a pyramidal structure is erected, called by Europeans the Tower of Babel, Nimrod by the natives of Bagdad, and Agerkaf by the Arabians, and supposed by some to be coeval with the remains of ancient Babylon. It is 190 feet high, and 100 in diameter.

KAZARON, or KAZERON, *r.* nearly seventy miles W.S.W. of Schiras, E. long. 51° 43'. This town is situated in a valley about thirty miles long, and seven or eight broad, bounded on the N. by a salt lake, and fertilized by many streams of excellent water. From the depopulation it has suffered, its present inhabitants do not exceed 3000 or 4000.

KEARSARGE GORE, a township of Hillsborough county, in New Hampshire, having 125 inhabitants.

KEENE, l. 3, 1810; l. 4, *r.* 1646.

KEITH. In 1811 the parish contained 755 houses, and 3352 persons; 1391 being males, and 1961 females; 173 families employed in agriculture, and 295 in trade, manufactures, and handicraft.

KELAT, the capital of Balouchistan, &c.; add—It is immediately encompassed by a low mud wall, and contains 4000 houses: the inhabitants are estimated at 7000, of whom 500 at least are Hindoos. The palace of the Khan is seated on a very high hill, and commands a view of the whole place and neighbouring country. The bazaar is well supplied, and the town has the appearance of opulence, being frequented by merchants, and enjoying a considerable trade. N. lat. 29° 6'. E. long. 67° 57'.

KELLY VALE, a township of Orleans county, in Vermont, having 40 inhabitants.

KELSO. In 1811 the parish of Kelfo contained 529 houses, and 4408 persons; 1979 being males, and 2429 females: and the district of Kelfo, comprehending twelve parishes, contained 2173 houses, and 12,378 persons; 5592 being males, and 6786 females: 1268 families employed in agriculture, and 797 in trade, manufactures, and handicraft.

KENDAL, *l. ult.* In the year 1811, Kendal ward contained 2719 houses, and 13,674 persons; and the town of Kirkby Kendal contained 1496 houses, and 7508 persons.

KENERA, l. 9, for there *r.* thefe.

KENFIG. In 1811, the parish contained 55 houses, and 242 persons; 119 being males, and 123 females: and Higher Kenfig, which is a hamlet in Mengan parish, contained 24 houses, and 129 persons; 69 being males, and 60 females.

KENILWORTH. In 1811 the parish contained 463 houses, and 2279 persons; 1145 being males, and 1134 females: 155 families employed in agriculture, and 264 in trade, manufactures, and handicraft.

KEN-

KENNEBECK, *l. ult.* It contained, in 1810, 32,564 inhabitants.

KENNEDIA, in *Botany*, so named in honour of Mr. Kennedy, the well-known cultivator at Hammermith, whose skill and experience have so much enriched the works of his son-in-law, Mr. Andrews.—Venten. Malmaif. 104. Brown in Ait. Hort. Kew. v. 4, 299.—Class and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Eff. Ch. Standard recurved, distant from the keel and wings. Legume of many single-seeded cells. Seeds crested.

1. *K. rubicunda*. Dingley Kennedia. Vent. t. 104. (*Glycine rubicunda*; Curt. Mag. t. 268. Willd. Sp. Pl. v. 3, 1065. Schneev. Ic. t. 28.)—Leaves ternate, ovate. Stalks mostly three-flowered. Legume very hairy.—Found by Sir J. Banks, in New South Wales. An elegant greenhouse shrub, with downy twining stems, and large flowers, party-coloured with red and purple.

2. *K. coccinea*. Tufted Scarlet Kennedia. Vent. t. 105, but not of Curtis.—Leaves ternate, ovate. Flowers capitate. Legume nearly smooth.—Gathered by Mr. Brown on the south-west coast of New Holland.

3. *K. prostrata*. Few-flowered Scarlet Kennedia. Br. in Ait. n. 3. (*Glycine coccinea*; Curt. Mag. t. 270. Willd. Sp. Pl. v. 3, 1065.)—Leaves ternate, ovate, hairy. Stalks one or two flowered. Stem prostrate.—Native of New South Wales, from whence its seeds were brought about 1790.

4. *K. monophylla*. Simple-leaved Kennedia. Vent. t. 106. (*Glycine bimaculata*; Curt. Mag. t. 263. Willd. Sp. Pl. v. 3, 1067. *G. violacea*; Schneev. Ic. t. 29.)—Leaves simple, smooth, reticulate; somewhat heart-shaped at the base. Flowers racemose. Discovered by Sir J. Banks, in New South Wales. Introduced into England with the last. Flowers violet, with two green spots on the keel.

Mr. Brown appears to have some unpublished species.

KENNET. Add—It contained, in 1810, 947 inhabitants.

KENSINGTON, *l. 4*, 1811—1379—10,886.

KENSINGTON, in America, *l. 4*, *r.* 781.

KENT, *l. 19*, &c. *r.* In 1811, Kent contained 62,063 houses, 373,995 persons; 183,500 being males, and 189,595 females.

KENT, in America, *l. 4*, *r.* 11,450; *l. 5*, *r.* 4,249; *l. 13*, *r.* 9834; *l. 24*, *r.* 1794.

KENT, *New*. See *New Kent*.

KENTUCKY. Add—See UNITED STATES.

KERBALA. See *VOLOGESIA*.

KERKUK, or KERKOOK, the largest town in the lower Kurdistan, in N. lat. 35° 29', 59 furlongs from Bagdad, and 41 from Mosul, on the road from one place to the other. It was formerly a military station, called by Strabo, Demetrius; and by Ptolemy, Corcura. Its population is estimated at 18,000 souls, Turks, Armenians, Nestorians, Kurds: this estimate, however, is supposed to exceed the truth by 5000. The city is defended by a mud wall, has two gates, seven mosques, fourteen coffee-houses, one hummum, one caravanera, one Armenian church, and twelve pieces of useless artillery mounted on the bastions. In the suburbs, are five mosques, nine small caravaneras, thirteen coffee-houses, three convents, and three Catholic churches. Near it is a number of naphtha pits, which afford an abundant supply of that commodity.

KERMANSRAW, one of the five districts of the province of Irak in Persia; the capital of this extensive and

fruitful district of the same name, and the residence of Mahomet Ali Meerza, the king's eldest son, and the most able and warlike of all the princes of Persia. It is a flourishing town, containing about 12,000 houses, at the extremity of a fine plain, through the centre of which runs the Karafu. It is adorned with many gardens, and fourteen hummums or public halls, four mosques, and yields a revenue of 15,000 tomauns a year.

KERRIA, in *Botany*, so named after Mr. William Kerr, a gardener, who has introduced the shrub in question, with many other Chinese plants, into the English gardens.—De Cardolle Tr. of Linn. Soc. v. 12, 156.—Class and order, *Icosandria Polygynia*. Nat. Ord. *Senticosæ*, Linn. *Rosaceæ*, Juss.

Eff. Ch. Calyx in five simple segments. Petals five. Capsules? superior, distinct, single-seeded.

1. *K. japonica*. Japan Kerria. De Cand. (*Rubus japonicus*; Linn. Mant. 245. *Corchorus japonicus*; Thunb. Jap. 227. Ait. Hort. Kew. v. 3, 314. Andr. Repof. t. 587. Curt. Mag. t. 1296.) See *RUBUS* under n. 38, and *CORCHORUS*, n. 12.—A correct examination of the *germens* has authorized the learned professor De Candolle to consider this favourite plant as a new genus, though the precise nature of its seed-vessels is not known.

KERSHAW, *l. 3* and *4*, *r.* 9867—4847.

KESWICK, *l. 7*, *r.* 352—1683.

KETTERING, *l. 24*, &c. *r.* 1811—713—3242—587—126.

KETU, *l. 4*, for Karyapa *r.* Kafyapa. Col. 2, *l. 4*, for *r. 2*.

KEW, *l. 4* and *5*, *r.* 1811—73—560.

KEYNSHAM, *l. 4* and *5*, *r.* 1811; the parish consisted of 318 houses, and contained 1748 inhabitants.

KHARASM, col. 2, *l. 3*, *r.* (See *KHIEVA*.)

KHOOE, a town of Persia, in the province of Azerbaijan, 22 furlongs from Tebrez. This town is the capital of a rich and extensive district, and the emporium of a considerable trade carried on between Turkey and Persia. It is said to contain a population of 25,000 souls, and is situated on a plain, famous for a battle fought, in 1514, between Shah Imael and Selim I. in which 30,000 Persians encountered 300,000 Turks. There is no town in Persia better built or more beautiful than Khooe: the walls are in good repair; the streets are regular, shaded with avenues of trees; and the ceilings of many of the houses are painted with extraordinary taste.

KHONSAR, a town of Persia, in the province of Irak, situated at the base of two ranges of mountains, running parallel with each other, and so close that the houses occupy the bottom and also the declivity of the hills to some height. The town, placed in a beautiful and romantic situation, and formed of houses and gardens, connected by means of its plantations, is about six miles in length, and about one-fourth of a mile in breadth. It contains 2500 families under a chief named Ali Shah, and yields an annual revenue of 5000 tomauns, exclusive of the fadir, which generally consists of dried fruits and a kind of cotton chintz. Although they have no corn in the valley, fruit is so abundant, that the inhabitants procure for it every article which they can want or desire. Of their apples, they make a kind of cyder, but it will not keep above a month. The women are celebrated for their beauty and vivacity.

KHORASSAN. Add—Khorassan is a level country, interspersed with sandy deserts, and irregular ridges of lofty mountains; the climate is accordingly various; in some parts temperate, but in others very cold; and the "had-e-fenum," which blows in the deserts for 40 days in the year, proves instantan-

instantaneously fatal to all who are exposed to it. This province was once populous and flourishing, and adorned with many princely cities. The soil is generally excellent, and produces wine, fruit, corn, rice, and silk in abundance, and of the best quality; but from the successive depredations which it has suffered, its prosperity and commerce have declined; its cities have decayed; and its fertile regions have been changed into solitary deserts. At present the authority of the king of Persia extends only over the cities of Meshed, Niha-pour, Turfish and Tabas. The southern parts, including Herat, are in possession of the Afghans, and some wandering tribes of Patans and Ymucks; and those to the E. and N. belong to the Ufbeck Tartars and Tarkomans. Khorassan is separated from Cabul by the mountains of Bamian and Goor. Its rivers are, the Oxus, the Tedzen or ancient Ochs, the Herirood, the Murgah or ancient Margus, the Eiler or ancient Siderius, from which the province of Alterabad derives its name, and which runs into the Caspian sea. The provinces of Irak and Khorassan are separated by a deep ravine, which intersects the road leading from Tehraun to Meshed, 22 furlongs E. of the former place. The districts in this direction are, Sumnun, Damgan, and Bistan. The present capital of the Persian division of Khorassan is Meshed. That part of Khorassan which extends from N. lat. 32° 30' to 34° 40', from 56° to 62° E. long., comprehends the following towns and districts, *viz.* Puhing, Zuzan, Turfish, Turbut, Jam, Kohistan, Niha-pour, and Sarukhs. M'Kinneir's Persia.

KIBBAN, furnished Madan from its mines, a town of the pachalic of Diarbekr, larger and more populous than Argunna Madan; situated at the base of a high mountain, and on the verge of a chafm, through which a stream forces its way to the Euphrates, distant about 1½ mile from the town.

KIDDERMINSTER, l. 5 and 6, r. 1811—1348—8038.

KIDWELLY, l. 5, r. 1811—329—1441; l. 10, add—The vicinity is rich in coals and iron-ore, and some iron and tin manufactories have long been carried on here; l. 11, r. condition; l. 13, add—Its markets are held on Tuesday and Friday, and it has three fairs in the year.

KIGES, a town of Ohio, in Gallia county, having 387 inhabitants.

KILBARCHAN. Add—By the parliamentary returns of 1811, the parish contained 360 houses, and 3563 inhabitants.

KILBIRNIE, for Renfrewshire r. shire of Ayr. In 1811, the parish contained 180 houses, and 1088 persons; *viz.* 509 males, and 579 females.

KILBRIDE. Add—In 1811, the town and parish contained 517 houses, and 2906 persons.

KILBRIDE, *West.* In 1811, the parish contained 183 houses, and 1015 persons; *viz.* 462 males, and 553 females: 76 families being employed in agriculture, and 108 in trade and manufactures.

KILKENNY, in America, l. 1, for Grafton r. Coos; l. 2, r. 28.

KILLBUSH, a township of Stark county, in Ohio, having 332 inhabitants.

KILLEARN, for KILLEAM, l. 1, and l. 3, add—In 1811, the parish contained 157 houses, and 997 persons.

KILLINGLY, l. ult. r. 2512.

KILLINGWORTH, l. ult. r. 2244.

KILMARNOCK, l. ult. r. In 1811, the town and parish contained 912 houses, and 10,148 inhabitants, of whom 1363 families were employed in trade and manufactures.

KILMAURS, a parish of Ayrshire, which, in 1811, contained 248 houses, and 1432 persons; *viz.* 685 males, and 747 females: 61 families being employed in agriculture, and 142 in trade and manufactures.

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KILPATRICK. The parish of New or East Kilpatrick contained, in 1811, 205 houses, and 1643 persons; *viz.* 746 males, and 897 females. The parish of Old or West Kilpatrick contained 370 houses, and 3428 persons; *viz.* 1595 males, and 1833 females. In the former, 81 families were employed in agriculture, and 120 in trade and manufactures: in the latter, 95 families were engaged in agriculture, and 557 in trade, &c.

KILSYTH. In 1811, the parish of Kilsyth contained 626 houses, and 3206 persons; *viz.* 1488 males, and 1718 females.

KILWINNING. In 1811, the parish contained 506 houses, and 3291 persons; *viz.* 1607 males, and 1684 females.

KIMBOLTON, l. 4, r. 1811; l. 5, r. 260—1400.

KINCARDINE. By the parliamentary returns of 1811, the parish of Kincardine, in Monteith, with Thornhill, contained 479 houses, and 2419 persons.

KINCARDINESHIRE, col. 2, l. 8, after Bervie, add—which burgh and parish, in 1811, contained 193 houses, and 927 persons; l. 46, r. 1811; l. 47, r. 5718—27,439; add—12,580 being males, and 14,859 females.

KINETON, l. 12, r. In 1811, the hundred contained 4066 houses, and 19,459 persons; and the parish 166 houses, and 801 inhabitants. Add—See KINGTON.

KING and Queen, l. 3, r. contains 10,989 inhabitants, of whom 6003 were slaves in 1810.

King George, l. 3, r. 6456, of whom 3876 were slaves in 1810.

KINGHORN. Add—In 1811, the burgh and parish contained 329 houses, and 2204 persons.

KINGSBRIDGE, l. 9, r. 1811—156—1242.

KINGSCLERE, l. 9, r. 1811—398—1863—53 families; l. 15, r. 1137.

KINGSTON, in America, l. 12, r. 324. Col. 2, l. 3, r. 746. Add—Also, East Kington, a township of the same county and state, having 442 inhabitants; l. 12, r. 832.

KINGSTON-upon-Thames, l. ult. r. 1811—716—4144.

KINGTON, l. 2, r. Huntingdon; l. 11, r. 1811—1617—329. See KINETON.

KING WILLIAM, a county of Virginia, containing 9285 inhabitants, of whom 5788 were slaves in 1810.

KINGWOOD, l. 1, r. Hunterdon; l. 2, r. 2605—48.

KINROSS, l. 4, r. The number of inhabitants of this parish, in 1811, was 2214, of whom 287 families were employed in trade and manufactures, and 92 in agriculture: the number of houses was 396.

KINROSS-SHIRE, col. 2, l. 9, r. 1811, as containing 1364 houses, and 7245 persons.

KINTORE, l. 11, r. 1811, the burgh and parish contained 218 houses, and 863 persons.

KINTYRE, l. 1, r. six for three; l. 2, six for three; l. 3, after *viz.* add—Argyll, Corrall, Illy, Kintyre, Lorn, and Mull. The first district contained, in 1811, 2702 houses, and 15,637 persons; Corrall, 1212 houses, and 6887 persons; Illy, 2636 houses, and 14,161 persons; Kintyre, 2959 houses, and 18,286 persons; Lorn, 2721 houses,

houfes, and 13,779 perfons; and Mull, 3010 houfes, and 16,834 perfons.

KIRCALDY, col. 2, l. 25, r. In 1811, the number of inhabitants in the burgh and parifh was 3747, occupying 381 houfes, of whom 405 families were employed in trade and manufactures, and 36 in agriculture: the number of houfes in the whole diftrict was 4899, and of inhabitants 31,958.

KIRKBY-LONSDALE, l. 5, r. In the year 1811, the town contained 271 houfes, and 1368 perfons.

KIRKBY-Moorfide, l. 6, r. 1811—319—1673.

KIRKBY-Stephen. Add—By the return of 1811, the township contained 250 houfes, and 1235 perfons.

KIRKCUDBRIGHT, l. ult. r. In 1811, the number of houfes in the burgh and parifh was 392, and of inhabitants 2763.

KIRKCUDBRIGHTSHIRE, col. 2, l. 8, r. 1811—33,684 perfons; 15,788 being males, and 17,894 females: the number of houfes being 6223.

KIRKHAM, l. 6, r. 1811—424—2214.

KIRKHAM, a township of Amounderness hundred, in Lancashire, part of Kifhen parifh, containing, in 1811, 424 houfes, and 2214 perfons; viz. 1039 males, 1175 females.

KIRKINTULLOCH, l. penult. r. In 1811, the number of houfes was 605, and of perfons 3740; of whom 573 families were employed in trade and manufacture.

KIRK-OSWALD. At the end, add—In 1811, the number of houfes in this township was 116, and of inhabitants 636.

KIRKWALL. Add—The burgh and parifh of Kirkwall contained, in 1811, 287 houfes, and 1715 perfons.

KIRMANSHA. Add—See KERMANSRAW.

KIRRIEMUIR, l. 12 and 13—1811, the town and parifh were returned as containing 955 houfes, and 4791 perfons.

KIRTON, l. 6, r. In 1811, it contained 307 houfes, and 1531 perfons.

KIRTON *Lindfay*, l. 5, 1811—258—1152.

KITTERY, l. 3, r. 2019.

KIZIL-OZAN. Add—This river, called the Golden Stream, is the natural boundary of Irak and Azerbaijan, and according to Rennell, the Gozan of fcripture.

KNARESBOROUGH, col. 4, l. 15, r. The population of the borough and township, as returned to parliament in 1811, was 4234, occupying 888 houfes.

KNEE, in the *Manege*, add—Broken knees very much depreciate the value of a horfe; and therefore various methods have been propofed for repairing and correcting this injury. Mr. Teplin recommends, firft of all, to wafh the injured parts well with a fponge and warm water, fo as thoroughly to cleanfe them from gravel or fand; and then plentifully embrocating them with camphorated lead-water, and bandaging over them a pledgit of tow moiftened with the fame, repeating the operation once or twice, if neceffary. This treatment fhould be continued, that a crust or cicatrix may be formed, which will render unctuous or greafy applications unneceffary. But if the laceration be confiderable, fuppuration will enfue, and fhould be encouraged by a common poultice, and the cure completed by digestive ointments. Mr. Lawrence propofes to make the hair grow after fuch accidents, by binding a piece of fheet-lead on the part after the wound is healed; and he alfo mentions a contrivance by which the knees of a valuable horfe may be preferred from this accident. (See HOSE.) He advifes to wafh the wound clean with a linen rag and warm foap-fuds, and having wiped the parts dry to apply brandy. Friar's balfam (compound tincture of benzoin) will, he fays, heal broken knees very fpeedily. A kind of hofe, or boots, is

ufed to defend the legs of race-horfes in travelling; and fome kind of guard, fattened above and below the knee, would be very ufeful to poff-horfes. For broken knees, Mr. Ryding recommends a mixture of 1 dr. of cantharides in fine powder with 1 oz. of olive-oil, which fhould be applied occasionally with the hand to the wounded part. This, he fays, by its gently ftimulating power, will brace the parts, promote the fore, and facilitate the growth of hair.

KNIGHTIA, in *Botany*, fo named by fir Jofeph Banks and Mr. Brown, in honour of Thomas Andrew Knight, eqn, the able president of the Horticultural Society, well known by his numerous writings on vegetable phyfiology.—Br. Tr. of Linn. Soc. v. 10. 193.—Clafs and order, *Tetrandria Monogynia*. Nat. Ord. *Proteaceae*, Juff. Br.

Eff. Ch. Calyx none. Petals four, equal, revolute. Stamens inferted above the middle of each petal. Nectary of four glands. Germen feffile, four-feeded. Stigma vertical, club-shaped. Follicle coriaceous, tipped with the style. Seeds winged at the fummit.

1. *K. excelfa*. Br. as above, t. 2.—Found by fir J. Banks, in New Zealand. A large tree, often eighty feet high. Leaves fcattered, flalked, elliptic-lanceolate, serrated, five or fix inches long; downy beneath. Flowers red, in denfe lateral clufers, with red flalks. This genus comes very near Aublet's and Schreber's RHOPALA, (fee that article,) differing only in having four feeds winged at the apex, inftead of two winged all round.

KNOWLTON, l. 2, r. 2064 inhabitants, including 17 flaves in 1810.

KNUTSFORD, l. 5 from the bottom, r. In 1811 there were in the township of Nether Knutsford 448 houfes and 2114 perfons, and in Over Knutsford 49 houfes and 243 perfons, of whom in the former township 276 and in the latter 37 were employed in trade, manufacture, and handicraft.

KOM, l. 4, add—It is faid to have been built in the year 203 of the Hegira, from the ruins of feven towns, which had compofed a fmall fovereignty under Abdalrahman, an Arabian prince:—l. 19, after khan, add—It was taken by the Afghans, when they invaded Perfia in 1722, and completely destroyed. Part of it has been fince rebuilt, but it ftill appears like a vaft ruin.

KORASAN, or KHORASSAN. Add—See KHORASSAN.

KORNA. See SHAT-UL-ARAB.

KOUMISS, an intoxicating drink, prepared by the Tartars from mare's milk. See MILK.

KRISHNA, l. 21 and 24 from the bottom, for Gapia r. Gopia; l. 18, for Tafuda r. Yafuda.

KROOK. See REGAN.

KUFA, a kind of boat in ufe on the Euphrates and Tigris; it is perfectly round, made of wicker-work, covered with bitumen, and generally about feven feet in diameter.

KUFRI, in *Geography*, a town of Perfia, in the pachalic of Bagdad, between Bagdad and Kerhook, containing about 2000 inhabitants.

KUPRI-ALTUN. See ALTUN-Kupri.

KURMAVATARA, l. 18 from the bottom, for beautiful r. bountiful.

KYANITE. See MINERALOGY, *Addenda*.

KYDIA, in *Botany*, fo called in memory of the late colonel Robert Kyd, firft director of the Calcutta garden.—Roxb. Corom. v. 3. 11.—Clafs and order, *Monadelphina Dodecandria*. Nat. Ord. *Columniferæ*, Linn. *Mabaceæ*, Juff.

Eff. Ch. Calyx double; outer of four or fix leaves. Petals five. Anthers in five tufts. Style three-cleft: Capfule of three cells, and three valves. Seeds folitary.

1. *K. calycina*.

1. *K. calycina*. Roxb. t. 215.—Outer calyx four-leaved, longer than the corolla.—Native of the banks of rivulets, in Coromandel and Hindoostan, flowering in the cool season. A tree, with long-stalked, roundish, mealy, slightly three-lobed leaves. Flowers small, white, in terminal panicles.

2. *K. fraterna*. Roxb. t. 216.—Outer calyx six-leaved, shorter than the corolla.—Native of the Circar mountains, flowering in the rainy season. A larger tree than the foregoing. Flowers more conspicuous. Leaves whiter underneath.

L.

LABORATORY. *Woulfe's Apparatus*, Plate V. *Chemistry*.

LAC, in *Coinage*. See LACK and RUPEE.

LACK, in *Geography*, l. 2, r. 1165.

LACKAWANACT, a township of Mercer county, in Pennsylvania, having 379 inhabitants.

LACTATES, in *Chemistry*. See LACTIC Acid.

LACTIC ACID. The description of this acid has been omitted, we shall therefore introduce a brief account of it here.

The lactic acid was first obtained by Scheele from four whey. He considered it as analogous to the acetic acid. Bouillon Lagrange afterwards instituted a series of experiments upon it, from which he drew the conclusion that it is merely acetic acid, contaminated with some saline and animal matter. Four years afterwards, Thenard advanced a similar opinion. Both these chemists, however, had obtained the acid which they examined by distillation, though Scheele had expressly stated that lactic acid, when distilled, was converted into acetic acid. The existence of lactic acid, therefore, was by no means disproved by their experiments. Soon afterwards, Berzelius took up the subject, and in an elaborate set of experiments proved that Scheele's original opinion was correct, and thus fully established the peculiar nature of lactic acid.

Berzelius obtained the lactic acid by the following complicated process. The extract obtained by evaporating whey to dryness was dissolved in alcohol, and mixed with alcohol holding $\frac{1}{75}$ th of its weight of concentrated sulphuric acid in solution, till there was an excess of sulphuric acid present. Sulphate of potash was precipitated. To get rid of the other acids, it was digested over carbonate of lead till the liquid acquired a sweetish taste. By this means, the sulphuric acid, the phosphoric acid, and most of the muriatic acid, were separated; but the lactic acid forming a soluble compound with lead remained in solution. A current of sulphuretted hydrogen gas being passed through the liquid threw down the lead. The liquid was digested over quick-lime till all the animal matter was separated. It now contained only lactic acid, muriatic acid, and lime. A portion of it was freed from lime by means of oxalic acid. This portion was then saturated with carbonate of silver; by means of this solution, the remainder of the liquid was freed from muriatic acid. Finally, the lime was thrown down by means of oxalic acid, so that nothing remained but lactic acid dis-

solved in water. To get rid of a small portion of oxalate of lime which it held in solution, it was evaporated to dryness, and redissolved in water.

Lactic acid thus obtained has a brownish-yellow colour, and a sharp four taste, which is much weakened by diluting the acid with water. While cold it has no smell, but when heated it acquires a sharp four odour, not unlike that of sublimed oxalic acid. It does not crystallize, but when evaporated to dryness forms a smooth varnish, which gradually attracts moisture from the air. It dissolves readily in alcohol. When heated it boils, emits a four smell, and leaves a bulky charcoal, not easily burnt. When distilled it gives out empyreumatic oil, water, acetic acid, carbonic acid, and inflammable gas.

Lactates.—All the lactates are more or less soluble in water, and hardly any of them can be made to crystallize. The *lactate of potash* and *lactate of soda* form a light yellow transparent gummy mass, which cannot be easily made hard. The *lactate of ammonia* has some tendency to crystallize. It forms a gummy mass, which acquires in the air an excess of acidity. When heated, most of the ammonia is driven off. The *lactates of barytes, lime, and magnesia*, are divided by alcohol into *superlactates* of those earths which are soluble in alcohol, and into *sublactates* which are insoluble. The metallic lactates do not possess remarkable properties. There are three *lactates of lead*; the *superlactate* which does not crystallize, the *lactate* which exists in grey crystalline grains, and the *sublactate* which is insoluble. The *lactate of zinc* crystallizes.

Dr. Thomson estimates the weight of the atom of lactic acid from Berzelius's experiments at 57.5.

Such are the chief properties of lactic acid and its compounds. We have entered further into the description than we should otherwise have done, on account of the importance of the subject,—the lactic acid existing both in a simple and combined state in most of the animal fluids. See BLOOD, and FLUIDS, *Animal*.

LACTODORUM, in *Ancient Geography*. See TOW-CESTER.

LACTUCARIUM, a name given by Dr. Duncan to the inspissated juice of the *lactuca sativa*, or common lettuce, and which has been found beneficial in various disorders, especially consumption, as an anodyne, where opium disagreed and could not be taken.

LADY-BIRD. See COCCINELLA.

LAFOURCHE, in *Geography*, a county of the territory of

of Orleans, containing in its interior, and in the parish of Affumtum, 4467 inhabitants.

LAGASCA, in *Botany*, after Don Mariano Lagasca, the worthy pupil, and now successor, of professor Cavanilles at Madrid.—Cavan. in Ann. de Cienc. Nat. v. 6. 331. Sims in Curt. Mag. 1804. (Lagasca; Willd. Enum. 941.)—Class and order, *Syngenesia Polygamia-segregata*. Nat. Ord. *Compositæ*.

Eff. Ch. Involucrum a simple row of leaves. Partial calyx five-toothed, single-flowered. Florets tubular, all perfect. Receptacle cellular, very hairy. Seed-down none.

L. l. mollis. Soft-leaved Lagasca. Curt. Mag. t. 1804.—Native of Cuba. A tender annual, of little beauty. Herb downy, very soft. Leaves stalked, ovate, toothed; the lower ones opposite. Flowers terminal, white.

LAHORE, l. 10, for Schauguve r. Shah Jehan.

LAKE, a town of Champaign county, in Ohio, containing 480 inhabitants.

LAKSHMI, col. 3, l. 4, for deities r. deity's wives.

LALESTON, *Higher and Lower*, in *Geography*, form a parish of Newcastle hundred in Glamorganshire. The Higher in 1811 contained 34 houses, and 157 persons; 81 being males, and 76 females: and the Lower contained 62 houses, and 271 persons; 111 being males, and 160 females.

LAMBETH, l. 25, r. 1811—7201; l. 24, r. 41,644, and 4491; l. 27, r. 338.

LAMBOURN, l. 13 and 14, r. In the year 1811, the population of the parish, with its dependent hamlets, *viz.* Blagrove and Halley, Eastbury and Bockhampton and Upper Lambourn, was 2674 persons, and the number of houses 527.

LAMP, APHLOGISTIC. Sir Humphrey Davy, during his researches on flame with the view to the construction of his safety-lamp for coal-mines (see **WIRE-GAUZE**), observed, that a fine platinum wire heated red hot and held in the vapour of ether would continue ignited. Soon after this curious fact was made known, Mr. Ellis of Bath thought of extending the principle, and found that a coil of fine platinum wire, stuck into the wick of a common spirit-lamp (being previously heated), might be kept red hot for any length of time. The lamp so constructed received the appellations of *aphlogistic lamp*, *lamp without flame*, &c.

The platinum wire for this experiment should not exceed $\frac{1}{80}$ th part of an inch in diameter. About twelve coils of this (the coil being about $\frac{3}{8}$ th of an inch in diameter, and as close together as possible without touching) are to be placed upon the wick of a common spirit-lamp, in such a manner that half be on the wick and half above it; the lamp is then to be lighted, and when the wire has become red hot the flame is to be blown out; the wire will then remain red hot for any length of time required, and in a dark room, if properly constructed, will emit a considerable light. Instead of alcohol, ether may be employed, or a similar effect may be produced by flicking the ignited wire into a piece of camphor.

LAMP, Safety, for coal mines. See **WIRE-GAUZE**.

LAMPETER, l. 2, r. 2501.

LAMPIC ACID, in *Chemistry*. The name recently given by Mr. Daniell to an acid generated by the combustion of alcohol, &c. by the aphlogistic lamp.

Sir Humphrey Davy observed, during the combustion of ether in the manner above described, the formation of a peculiar acid pungent vapour, which he considered as a new product. Mr. Faraday soon afterwards described some of the properties of this acid, and more recently Mr. Daniell has given us a more full description. Mr. Daniell prepared

it for his experiments by burning the aphlogistic lamp under an alembic head, and collecting the products; but we understand it may be formed much more readily by passing the vapour of ether through a tube containing platinum wire. The lamic acid, when as pure as possible, is a colourless fluid, of an intensely four taste and pungent odour. Its vapour when heated is extremely irritating and disagreeable, and produces an oppression on the chest, something like that produced by chlorine. It reddens vegetable blues, and decomposes all the earthy and alkaline carbonates. Its sp. gr. when rectified as highly as possible, according to Mr. Daniell, is 1015.

The *Lampates of Potash and Soda* are deliquescent salts, and do not readily crystallize. The *lampate of ammonia* is volatile, and easily decomposed. The *lampate of barytes* readily crystallizes in colourless transparent needles. The *lampates of lime and magnesia* are deliquescent.

The lamic acid has the property, according to Mr. Daniell, of reducing many of the metallic oxids; this is particularly the case with the oxids of gold and mercury. When warm nitrate of mercury, according to Mr. Daniell, is mixed with lamic acid, a metallic shower takes place, and brilliant globules of mercury soon accumulate at the bottom of the vessel.

Mr. Daniell estimates, from his experiments, the weight of the atom of lamic acid at about 64, and considers it as composed of 1 atom hydrogen + 1 atom carbon + 1 atom water. How far these determinations are to be depended upon we cannot say, though we think it probable that they are incorrect.

LANARK, l. ult. r. 1811—5677—658.

LANARKSHIRE, l. 13, r. according to the parliamentary returns in 1811, the population of the county consists of 191,752 persons, occupying 32,040 houses; the males are 88,688, and the females 103,064: the families employed in trade, manufactures, and handicraft, are 27,672, and those employed in agriculture 5387.

LANCASHIRE, l. 21, r. 1811—144,283—828,309; l. 22, r. 114,522; l. 23, r. 23,305. The number of males was 394,104, and that of the females was 434,205.

LANCASHIRE. This county contains several villages and parishes, which, by the prevalence of its manufactures, are become populous, but which our limits will not allow us to mention.

Astton-under-Lime (omitted in its proper place) deserves a particular notice as a parish in the hundred of Salford, which in 1811 contained 3042 houses, and 19,052 persons, *viz.* 9146 males, and 9906 females; 213 families being employed in agriculture, and 2737 in trade, manufactures, or handicraft.

Astton-in-Mankerfield is also a township in the hundred of Weit Darby and parish of Winwick, which contains 864 houses, and 4747 persons; *viz.* 2342 males, and 2405 females: 163 families being employed in agriculture, and 726 in trade, manufactures, &c.

LANCASTER, col. 4, l. 26 from bottom, r. 1811; l. 25, r. 1694 and 9247.

LANCASTER, in America, l. 5, r. 3927—44. Col. 2, l. 5, r. 5592 inhabitants, of whom 3112 were slaves in 1810; l. 7, r. 6318; l. 8, r. 1646; l. 18, add—and by the census of 1810, 5405 inhabitants, including 700 slaves; l. 31, add—Also, a township of the same county, containing 592 inhabitants:—l. 43, r. 1694; l. 44, for Grafton r. Coos; l. 47, r. 1810, and 717.

LANDAFF, l. 2, r. 650.

LANDGROVE, a town of Bennington county, in Vermont, having 299 inhabitants.

LANDSCAPE, *l. penult. r.* wherein. Col. 2, l. 6 from bottom, *r.* aims.

LANESBOROUGH, l. 3, *r.* 1302.

LANGAYA, a genus of serpents, the characters of which are, that it has abdominal plates, caudal rings, and terminal scales. Of this genus there is only one species, differing from all the rest of the serpent tribe in having the upper part or beginning of the tail marked into complete rings, or circular divisions, resembling those on the body of the amphibia, while the extreme or terminal part is covered with small scales, as in the genus *anguis*. This species is called *Langaya natufa*, or large-fnouted *Langaya*, has 184 abdominal scales, and 42 caudal rings: it is a native of Madagascar, and was first described by M. Bruguiere of the Royal Society of Montpellier. The natives of Madagascar are much afraid of this serpent, as they conceive it to be very poisonous.

LANGDON, l. 3, *r.* 632.

LANGHOLM, l. 5, *r.* 1811, 2636 persons, occupying 522 houses.

LANGPORT, col. 2, l. 3, *r.* 1811—112; l. 4, *r.* 861.

LANTWIT, MAJOR, a parish of Cowbridge hundred, in the county of Glamorgan, containing, in 1811, 179 houses, and 786 persons; *viz.* 357 males, and 429 females.

LANTWIT, LOWER, a parish near Neath, which, in 1811, contained 116 houses, and 564 persons; *viz.* 265 males, and 299 females.

LAR, l. 6, add—It still contains about 12,000 inhabitants, celebrated for the manufacture of muskets and cotton cloth. It has very handsome buildings, and particularly a bazaar, that is reckoned the noblest structure in Persia. N. lat. 37° 30'. E. long. 52° 45'. See TAREM.

LARISTAN, l. 1, after Persia, add—extending along the Northern shore of the gulf from E. long. 55° to 58°.

LARUS, col. 3, *r.* RIDIBUNDUS.

LASCAR, a term in India; denoting a camp-follower, but applied to native sailors and artillerymen.

LASCO, JOHN. Add—A brief account has already been given of this famous reformer under ALASCO.

LASSUS. See ORLANDO.

LATIMORE, in *Geography*, a township of Adams' county, in Pennsylvania, having 666 inhabitants.

LAUD, l. 10 from bottom, *r.* Stanford.

LAUENHAM, at the close, *r.* 1811—308, and 1711.

LAUGHTER, l. 15, add—See LUNGS.

LAUGHTON, *East*, l. 11, *r.* 1811; l. 12, *r.* 899—184; l. 16, for Whorlston *r.* Potters and Cannings; l. 17, *r.* 1811—127; l. 18, *r.* 582.

LAUNCESTON, col. 2, l. 4 and 3 from the end, *r.* 1811—1758, and 262.

LAUREAT, POET, l. 5, add—In anciently conferring degrees in grammar, which included rhetoric and verification, at our universities, particularly at Oxford, a wreath of laurel was presented to the new graduate, who was afterwards usually styled "Poeta Laureatus." These scholastic laureations seem to have given rise to the appellation:—l. 19, after Edw. IV. insert—who appointed John Kay poet laureat, and who, according to Warton, was the king's first poet under this appellation. The only composition he has transmitted to posterity is a prose English translation of a Latin history of the siege of Rhodes. In the dedication, addressed to king Edward, or rather in the title, he styles himself *hys humble poete laureate*. The same appellation occurs under, &c. At the close, add—Warton's Hist. of English Poetry, vol. i. p. 128.

LAUROPHYLLUS, in *Botany*, an exceptional compound name.—Thunb. Prodr. præf. n. 16. Willd.

Sp. Pl. v. 4. 1115. Ait. Hort. Kew. v. 5. 481.—Clafs and order, *Tetrandria Monogynia*. Nat. Ord. . . .

Eff. Ch. Calyx four-cleft, inferior. Corolla none. Some male flowers.

1. *L. capensis*. Thunb. Prodr. 31. Willd. n. 1. Ait. n. 1.—Found at the Cape of Good Hope. A tree, with round, brown, shining branches; alternate, oblong, serrated, smooth, coriaceous leaves; and minute flowers, in terminal panicles.

LAUSANNE, in *Geography*, a township of Northampton county, in Pennsylvania, having 157 inhabitants.

LAWSVILLE, a township of Luzerne county, in Pennsylvania, having 169 inhabitants.

LEAD, in *Chemistry*. According to the most recent determinations, *massicot*, or the protoxyd of lead, is a compound of 100 lead + 7,692 oxygen; and the *brown* or *peroxyd*, of 100 lead + 15,384 oxygen. Hence the weight of the atom of lead will be 130, oxygen being 10. From these data, the composition of all the other compounds of lead can be easily estimated. See ATOMIC THEORY.

What is usually called *minium*, or *red-lead*, is a combination of these two oxyds, or of 2 atoms lead + 3 atoms oxygen: *Red-lead* does not appear capable of combining with acids, at least no salt of which it forms a constituent is at present known.

LEAD, page 10, c. 2, l. 3, after gallic, read acid.

LEAD-ORES. See LEAD, and MINERALOGY, *Addenda*.

LEATHERHEAD. In 1811 the parish contained 312 houses, and 1209 persons; *viz.* 580 males, and 629 females: 75 families being employed in agriculture, and 103 in trade, manufactures, and handicraft.

LEBANON, in America, l. 3, *r.* 1810; l. 4, *r.* 1938; l. 8, *r.* 2580; l. 11, 1810; l. 12, *r.* 1808. Col. 2, l. 3, add—containing 1434 inhabitants.—Also, a township in the same county, containing 2473 inhabitants.—Also, a town of Hunterdon county, in New Jersey, containing 2409 inhabitants.

LEBECKIA, in *Botany*, Thunb. Prodr. præf. n. 47. Willd. Sp. Pl. v. 3. 946. Ait. Hort. Kew. v. 4. 261.—Clafs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminosæ*, Juss.

Eff. Ch. Calyx in five deep acute segments, with rounded sinuses. Stamens all connected. Legume cylindrical, with many seeds.

Thunberg and Willdenow describe three species with simple, and five with ternate, leaves, all shrubs, found at the Cape of Good Hope. Three are in Hort. Kew. *L. contaminata*, *sericea*, and *cytisoides*, all previously referred to SPARTIUM; see that article.

LECANORA, Ach. Syn. 146. "Lichenogr. 77. t. 7. f. 3—7;" a new genus, consisting of 139 species, of the *Lichen* tribe, being the crustaceous species of PARMELIA; see that article.

LECHLADE, l. 16 from bottom, *r.* 1811; l. 15, *r.* 993; l. ult. *r.* 195.

LECIDEA, in *Botany*, Ach. Syn. 11. "Lichenogr. 32. t. 2. f. 1—7." A genus of *Lichenes*, chiefly the *tuberculati* of Linnæus, whose fields have no border from the substance of the *frond* or *crust*, 153 species are now described, whose *fronds* are various.

LEDBURY, col. 2, l. 17, *r.* 1811—3136; l. 18, *r.* 604.

LEDYARD, col. 2, l. 39, *r.* Ochotok.

LEE, in Virginia, l. 6, *r.* 4694 inhabitants, of whom 336 were slaves in 1810; l. 10, *r.* 1329; l. 12, *r.* 1305.

LEE, a large measure in China, rather more than one-third of a mile.

LEEDS, col. 2, l. 25, *r.* 1811, the town and liberty contained

contained, &c.; l. 26, r. 12,249 and 62,534; l. 27, r. 11,739 families were flated, &c.

LEEDS, in America, l. ult. r. Kennebeck for Cumberland; after county, add—containing 1273 inhabitants.

LEEKE, l. 7, r. 1811—832; l. 8, r. 3703.

LEELITE. See MINERALOGY, *Addenda*.

LEGEND, col. 2, l. 34, r. Sybaris. Col. 3, l. 36, for found r. fecret; l. 8 from bottom, r. Coningham.

LEHI, in *Geography*, add—Alfo, a township containing 1188 inhabitants.

LEICESTER. At the clofe, r. 1811, 4609 houfes, 23,146 inhabitants.

LEICESTER, in America, l. 3, r. 609; l. 6, r. 1181.

LEICESTERSHIRE, col. 3, l. 24, r. 1811—150—419; add—of whom 10,801 were males, and 12,345 females; 17,027 families were employed in trade and manufactures, and 11,700 in agriculture. The number of houfes was 30,019.

LEIGH, WEST. In 1811, this township contained 341 houfes, and 1960 perfons; viz. 927 males, and 1033 females.

LEIGHTON-BUZZARD, l. 5, r. 1811—408 houfes, 2114 inhabitants; of whom 187 families were employed in trade and manufacture, and 283 in agriculture.

LEITH. At the end, add—By the parliamentary return of 1811, North Leith had 1085 houfes, and 4875 inhabitants; and South Leith had 838 houfes, (if not a miltake in the number), and 15,488 inhabitants.

LEMINGTON, or LIMINGTON, l. 2, add—containing 1774 inhabitants.

LEMINGTON-PRIORS, a parish of Warwickshire, in the hundred of Knightlow and Kenilworth divifion, contained, in 1811, 125 houfes, and 543 perfons; viz. 275 males, and 268 females. But fince that period, it has been much referred to as a watering-place refembling Cheltenham; and the number of private houfes, baths, hotels, and public buildings, for the accommodation and amufement of its vifitors, has been very much augmented, and is every year increafing.

LEMNIAN EARTH. See PHRAGIDE.

LEMON, a township of Ohio, in Butler county, having 1308 inhabitants.

LEMPSTER, l. 3, r. 1810 and 854.

LEMUR, col. 3, l. 17 from bottom, r. MACACO.

LENIOR, or LENOIRE, l. 3, r. 5572, of whom 2449 were flaves in 1810.

LENOX, l. ult. r. 1310.

LENS, *Criftalline of the Eye*, *Chemical Properties of*. See EYE.

LEOMINSTER, col. 3, l. 19, r. the population of the borough and parifh, &c.; r. 1811—3238; l. 20, r. 730.

LEOMINSTER, in America, l. 5, r. 1584.

LEONINE, l. 12, after Leonius, add—A French monk of St. Victor, at Marfeilles, about the year 1135; l. 14, after III.—But rhymes in Latin verfes were in ufe much earlier. See Warton's *Hift. of Poetry*, vol. i. diff. ii. At the clofe, add—See RHYME.

LEPANTHES, in *Botany*, from λεπας, bark, and ανθος, a flower, becaufe thefe plants grow on the barks of trees.—Swartz *Nov. Act. Upl.* v. 6. 85. t. 5. f. 6. *Ind. Occ.* 1555. Schrad. *Journ.* v. 2. 240. t. 2. f. 3. Schrad. *N. Journ.* v. 1. 100.—Clafs and order, *Gynandria Monandria*. *Nat. Ord. Orchidee*.

Eff. Ch. Calyx ringent; leaves ovate, pointed. Petals linear; elongated at the bafe. Lip none. Style winged. Anther a deciduous lid.

Four Weft Indian fpecies are defcribed, fmall plants,

each with a thick, folitary, roundifh leaf, and one or two clufters of minute flowers.

LEPIDAGATHIS, from λεπας, a feale, and ανθος, a ball, or round aggregation of any kind.—Willd. *Sp. Pl.* v. 3. 400. *Brown Prodr.* Nov. *Holl.* v. 1. 478.—Clafs and order, *Didymia Angiofpermia*. *Nat. Ord. Acanthacee*, Br.

Eff. Ch. Calyx in five deep unequal fegments. Corolla two-lipped. Capfule feffile, of two cells, with a fixed partition. Seeds two in each cell. Br.

L. *criftata*, Willdenow's only fpecies, from the Eaft Indies, bears aggregate, feffile, fealy balls of flowers, chiefly about the crown of the root. The numerous ftems are decumbent, eighteen or twenty inches long, leafy, fquare. Leaves fimple, oblong, rough-edged. Mr. Brown has corrected the character, as above, from various Chinefe and tropical fpecies, in fir J. Banks's herbarium.

LEPIDOLITE. See LEPIDOLITE, and MINERALOGY, *Addenda*.

LEPSIA. Add—It is now called Lipfo.

LERIA, l. 2, after Strabo, add—This little ifland has three harbours, and is faid to produce abundance of the wood of aloes, fo much eftemed in Turkey as a perfume; though others have doubted this fact, on account of the high price of this wood at Conftantinople. In this ifland is a monaffery, and it has a town called Lera.

LERWICK. At the clofe, r. 1811—1049; add—the number of houfes was 252.

LESGESTAN, one of the fmall ftates of Dagheftan, confifting of a ftupendous range of mountains, very long but narrow, and forming the whole N.E. frontier of Georgia. The Lefgi or Lefghans, who inhabit this country, are a wild and favage banditti, divided into different tribes and fpeaking a different dialect. Their houfes are fituated on the loftieft mountains, and on the moft tremendous precipices: they are connected by ftone or wooden bridges, and roads carried through rocks; and they are fupplied with water by pipes or canals cut out of the rocks. The foil is fcanty, and in order to furnifh themfelves with the means of fubfiftence, the furface is increafed to the fummits of the elevated ground by graduated terraces, the intermediate fpace being filled up with rubbifh, and covered with earth. Thefe people are the braveft, as well as the moft turbulent, of all the nations of mount Caucasus, exciting terror in their neighbours, laying wafte their cottages, and carrying away the inhabitants into fervitude. They have long preferved their liberty and independence, and rendered their country inacceffible to any foreign invaders. Moft of them are Mahometans; and the few tribes that continue in ignorance, never change the object of their veneration, which is either the fun, moon, or ftars; or indeed any thing that has made an impreffion on their minds. They hire themfelves to fight the battles of their neighbours, at the price of twelve roubles the campaign, which is to ceafe at the end of three months from the appointed day. They often take different fides, not caring againft whom they fight; and thus it often happens, that the Lefghans falls by the fword of his brother or moft intimate friend. They are lightly drefsed, after the manner of the Tartars, and armed with a gun, pitols, dagger, and fabre. Their women furs-pafs in fymmetry and beauty all the females of mount Caucasus, and fetch the largeft prices in the markets of Conftantinople. M'Kinnear's *Perfia*.

LESSERTIA, in *Botany*, named in honour of the late Mr. Stephen Deleffert, to whofe mother Rouffeau's celebrated Letters on Botany were addreffed, and who, like all his family, was no lefs endeared, to thofe who knew him, by perfonal worth than by talents.—"De Cand. *Afragal*.

37." Brown in Ait. Hort. Kew. v. 4. 327.—Clafs and order, *Diadelphia Decandria*. Nat. Ord. *Papilionaceæ*, Linn. *Leguminofæ*, Juff.

Eff. Ch. Calyx five-cleft. Standard flat. Keel obtuse. Stigma capitate. Style bearded in front. Legume membranous, without valves.

L. annua, (*Colutea herbacea*; Linn. Sp. Pl. 1045.), and *L. perennans*, (*C. perennans*; Jacq. H. Vind. v. 3. t. 3.), fee COLUTEA, n. 11 and 12; with *L. diffusa*, (*Galega dubia*; Jacq. Ic. Rar. t. 576; are the only species in Hort. Kew. all natives of the Cape of Good Hope, composing a very natural genus.

LETERT, in *Geography*, a township of Gallia county, in Ohio, having 501 inhabitants.

LETTERKENNY, l. 2, r. 1549.

LEVER, col. 2, l. 3, dele (See *Plate Surgery*.)

LEVERETT, l. 4, r. 769.

LEVES. At the clofe, r. The population of the rape of Lewes was flated, in the parliamentary return of 1811, to be 18,659 perfons, occupying 2932 houfes.

LEWIS XVI. col. 10, l. 44, r. the fon, Lewis XVII., died very miserably June 8th, 1795, and his filter, Maria Therefa Charlotte, was delivered up in exchange for deputies, December 26th, 1795. The queen was brought to the scaffold on October 16th, 1793, and Elizabeth, the king's filter, May 12, 1794. Col. 11, l. 2, add—Lewis XVIII., on whom the crown devolved after the death of Lewis XVI. and his fon Lewis XVII., retired, during the fubfequent period of the *Revolution*, (which fee, firft to Peterburg, and was allowed a proceffion by the emperor of Ruffia, April 3d, 1798; he afterwards fought an afylum in this country, and landed at Yarmouth, under the title of the Count de Lille, October 6th, 1807; and being recalled to the throne of France, made his public entry into London from Hartwell, where he had refided; April 21ft, 1814; and having failed from Dover April 23d, made his entry into Paris May 3d, 1814; but quitted this city again in confequence of the landing of Buonaparte in France, March 21ft, 1815. After the battle of Waterloo, he returned to Paris, and refumed the government, July 8th, 1815.

Lewis, in *Geography*, a county of New York, containing 6433 inhabitants, of whom 4 were flaves in 1810.—Alfo, a township of Ohio, in Clermont county, having 903 inhabitants.—Alfo, a county of Kentucky, containing 2357 perfons.

LEWISBURG, a town of Kentucky, in Macon county, having 19 inhabitants.

LEWISHAM. In 1811, the parifh contained 1105 houfes, and 6625 perfons; 2923 being males, and 3702 females.

LEWISIA, in *Botany*, in memory of Meriwether Lewis, eq. late governor of Upper Louiffiana, the difcoverer of feveral new American plants.—Purfh 368.—Clafs and order, *Polyandria Monogynia*. Nat. Ord.

Eff. Ch. Calyx of many membranous leaves. Petals twice as many. Style three-cleft. Capfule fuperior, of three cells. Seeds two in each cell, lenticular, polished.

1. *L. rediviva*. Purfh n. 1.—On the banks of Clark's river, perennial, flowering in July. *Leaves* radical, linear, rather fucculent. *Stalk* radical, bearing one or two handfome white flowers, whole calyx is elegantly veined with red. *Purfb.*

LEWISTOWN, l. 3, r. 1038; l. penult. r. 474.

LEXAWASCEIN, a township of Wayne county, in Pennsylvania, containing 165 inhabitants.

LEXINGTON, l. 2, add—containing 6641 inhabitants, of whom 1911 were flaves in 1810; l. 19, after univerfity,

add—or college, a Lancafterian fchool, and other well-regulated feminaries; l. 22, r. in 1810, was 4326, of whom 1509 were flaves. In 1817, it amounted to 6000, though in 1773 it was merely a hunting camp; l. 28, after Georgia, add—in Oglethorp county, having 113 inhabitants; l. 34, add—In 1810, the inhabitants were 1052.

LEYDEN, l. ult. r. 1009.

LEYLAND, a township of Leyland hundred, in Lancafhire, which, in 1811, contained 459 houfes, and 2646 perfons; 1263 being males, and 1383 females: 97 families employed in agriculture, and 391 in trade, manufactures, and handicraft.

LIBEL, col. 4, l. 30, dele pillory.

LIBERTY, l. 12, r. 6228 inhabitants, of whom 4808 were flaves in 1810. At the clofe—Alfo, a township of Butler county, in Ohio, containing 1790 inhabitants.—Alfo, a township of Ohio, in Delaware county, containing 206 inhabitants.—Alfo, a township of Highland county, in Ohio, having 1120 inhabitants.—Alfo, a township of Ohio, in Trumbull county, having 473 inhabitants.

LICHEN ISLANDICUS, *Chemical Compofition of*. This has been fubmitted to a rigorous and curious analysis by Berzelius. Our limits will not permit us to enter into the details, but the following are the refults:

Syrup	-	-	-	3.6
Bitartrate of potafh, with fome tartrate of lime	-	-	-	} 1.9
and phofphate of lime	-	-	-	
Bitter principle	-	-	-	3.0
Green wax	-	-	-	1.6
Gum	-	-	-	3.7
Extractive colouring matter	-	-	-	7.0
Starch	-	-	-	44.6
Starchy infoluble matter	-	-	-	36.6
				102.0

We perfume in the above analysis the excefs of weight (if not an error) was owing to water.

This indefatigable chemift afterwards examined other fpecies of lichens, fuch as the *L. barbatus*, *L. fulgigatus*, and the *L. fraxineus*. He found them all characterized by the prefence of a fpecies of ftarch which poffeffes feveral peculiar properties.

LICHFIELD, l. 4, r. 1811—1010 houfes, 5022 inhabitants, 509 families employed, &c.

LICK, a township of Ohio, in Rofs county, having 334 inhabitants.

LICKING. Add—Alfo, a county of Ohio, containing 7 townfhips, and 3852 inhabitants.—Alfo, a township of the faid county, having 632 inhabitants.—Alfo, a township of Ohio, in Mufkingum county, containing 796 inhabitants.

LIEOU-KIEOU, or Loo-choo, or *Great Loo-Choo*, l. 2, after number, add—or rather innumerable. At the clofe, add—The belt maps are wrong in the fituation of Loo-choo. They place its town between 25° 45' and 27° 53' N. lat. and between 128° 5' and 129° E. long. The ifland is alfo made to extend about 130 miles from N. to S. with an uniform breadth of about 30 miles. Its true direktion is nearly N.E. by N. and S.W. by S.; its length is only 56 miles, and its breadth about 11. The longitude of the western extremity is 120° 34' E., and of its eastern 128° 19'. The latitude of the S. point is 26° 42' N. and of the N. point 26° 52½'. See an interefting account of thefe iflands in Capt. Hall's Voyage to Loo-choo, or Edinburgh Rev. N° 58. p. 460, &c.

LIME,

LIME, in *Chemistry*. Lime, according to the recent determination of Dr. Thomson, is a compound of 100 calcium + 38.09 oxygen: hence the weight of the atom of calcium will be 26.25, and of lime 36.25. We expect that the weight of the atom of lime will be hereafter proved to be 37.5. See *ATOMIC THEORY*.

The salt of lime, commonly known by the name of *oxymuriate of lime*, and employed for bleaching, has been recently demonstrated by Dr. Thomson to be a real *chloride of lime*, and not a *chloride of calcium*; that is to say, it is a compound of *chlorine and lime*. (See *BLEACHING, CHLORINE, and OXYMURIATIC ACID*.) Dr. Thomson has also rendered it probable, that barytes, strontian, potash, and soda, as well as many of the metallic oxids, likewise unite with chlorine, and form *chlorides* of these respective bases.

LIMERICK, in America, l. 4, r. 1177; l. 5, r. 1282.

LIMINGTON. Add—with 1774 inhabitants.

LINCOLN, col. 6, l. 4 and 3 from bottom, r. 1811—1813—8861.

LINCOLN, in America, l. 16, after Warren, add—The number of inhabitants, in 1810, was 42,992; l. 22, r. 16,359—2489. Col. 2, l. 3, r. 4555; l. 4, 2212; l. 5, r. 8676—2341; l. 11, r. 109; l. 13, r. 221; l. 15, r. 713. Add—Also, a county of West Tennessee, containing 6104 inhabitants, of whom 720 are slaves.

LINCOLNSHIRE, l. 8, r. 1811—46,368—237,891; l. 9, r. 117,022 males, 120,869 females, 13,184 families; l. 11, r. 29,881.

LINCOLNTOWN. Add—Also, a town of Georgia, in Lincoln county.

LINCOLNVILLE. Add—It contains 1013 inhabitants.

LINE, in *Fortification*. Add—See *FIELD-FORTIFICATION*.

LINGA, col. 2, l. 2, for fire r. fine.

LINLITHGOW, l. ult. r. 1811—4022—535; the country part having 229 houses, and 1465 persons; and the town part having 306 houses, and 2557 persons.

LINLITHGOWSHIRE, col. 2, l. 15, r. 1811—19,451, occupying 3998 houses: the number of males is 8874, and that of females 10,577; of these 1506 families are employed in trade and manufactures, and 1132 in agriculture. Col. 4, l. 18, after town, add—The number of houses in the parish is 352, and of persons 2704.

LINNÆUS, col. 5, l. 24; r. journal. Col. 8, l. 19, r. Caper. Col. 11, l. 12, r. Oeland. Col. 15, l. 7, r. Hammasley.

LINOZOSTIS. Add—See *MERCURIALIS*.

LIQUIDS, *Expansion of*. See *EXPANSION and HEAT*.

LISBON, in America, l. 3, r. 1128. Add—Also, a town of Maine, in the county of Lincoln, having 1614 inhabitants.

LISKEARD, l. 32, r. in the year 1811, the borough and parish were returned to parliament as containing 523 houses, and 2884 persons; the borough having 361 houses, and 1975 persons.

LISMORE. At the close, add—By the returns of 1811, the parish of Lismore, in the district of Lorn, contains 252 houses, and 1323 persons.

LISTERA, in *Botany*, dedicated by Mr. Brown to the memory of the famous English conchologist, Dr. Martin Lister, who wrote several papers on vegetable physiology, in the *Philosophical Transactions*.—Brown in *Ait. Hort. Kew.* v. 5. 201. Sm. *Compend.* 130.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Eff. Ch. Calyx and petals spreading. Lip without spur, cloven, not embraced by the calyx. Column without wings. Anther parallel to the stigma.

L. ovata, and *L. cordata*; see *EPACTIS*, n. 10 and 11. **LITCHFIELD**, l. 2, r. 1847; l. 6, r. 1810—382; l. 9, r. 22; l. 10, r. 41,375; l. 20, r. 4639.

LITHION, **LITHIA**, or rather **LITHINA**, in *Chemistry*, the name of a fixed alkali recently discovered in Sweden, and so called from *λίθος*, a stone, because obtained only from mineral substances. This alkali was first detected by Mr. Arvedson, a young Swedish chemist, and pupil of Berzelius. He obtained it from a mineral found at Utén, in Sweden, and which had been some time before described, and named *petalite* (see *PETALITE*) by M. D'Andrada. He found it likewise soon after in *triphan* (or *spodumene*) and in crystallized *lepidolite*, all minerals from the same place.

Lithina is principally distinguished from the other alkalis by its great capacity for saturating acids. Sir H. Davy has succeeded in reducing it to the metallic state. *Lithinum*, as this metallic base may be called, bears a strong resemblance to the other alkaline metals, especially to sodium, to which it seems most nearly allied.

With respect to the salts of lithina, they have not yet been rigorously examined. The *sulphate* crystallizes with sufficient facility, and the crystals contain no water of crystallization. Their solution is not precipitated by the muriate of platinum, nor by the tartaric acid. The *muriate* deliquesces like the muriate of lime, and melts below a red heat. The *nitrate* crystallizes in rhomboids, but readily attracts moisture. The *carbonate* crystallizes in prisms, and the crystals which are commonly very minute are not very soluble in water. The *sulphuret* of lithina is very soluble, and of a yellow colour.

According to Vauquelin, 100 parts of lithina contain 43.5 of oxygen; hence the weight of the atom of lithinum will be very nearly 13, and of lithina 23, from which data the composition of all its salts can be easily ascertained.

LITHOMARGE. See *MINERALOGY, Addenda*.

LITHONTRIPTICS. See *LITHOTOMY, and URINARY Calculi*.

LITTLE BRITAIN, l. 14, r. 1700.

LITTLE BEAVER, a township of Beaver county, in Pennsylvania, having 1379 inhabitants.

LITTLE COMPTON, l. 2, r. 1553.

LITTLE CREEK, l. 2, r. 2039; l. 3, r. 3840.

LITTLESTOWN, a township in Adams' county, in Pennsylvania, having 287 inhabitants.

LITTLETON, l. 3, r. 773; l. 5, r. 873.

LIVERMORE, l. 2, r. Oxford for Cumberland; l. 4, r. 1560.

LIVERPOOL, l. 6, r. 1811—94,376—15,589.

LIVINGSTON, l. 4, r. 3575—685.

LLANBADARN VAWR, col. 2, l. 17, exclusive of Aberystwith; l. 18, r. 1811—525—2998. Aberystwith contains 477 houses, and 2264 persons.

LLANBEDER, l. 2, r. Moyddyn; l. 10, for Tuesday r. Saturday; and add—it has nine fairs in the year; l. 21, r. 1811—128; l. 22, r. 692.

LLANDAFF, near the close, r. 1811—199 houses, and 963 inhabitants.

LLANDEILO VAWR, l. 2, infern—Cayo, and r. Perfedd. Col. 2, l. 46, r. The inhabitants of Llandeilo, exclusive of the hamlet of Llandeilo-villa in the hundred of Perfedd, which contains 184 houses, and 776 inhabitants, according to the parliamentary returns of 1811, are estimated at 1103, and the houses at 222.

LLANDOVERY, l. 6. By the returns of 1811, the township

township contained 266 houses, and 1442 inhabitants. Col. 2, l. 5, for Friday *r.* Saturday. Add—It has six fairs in the year.

LLANDRINDOD. Add—In 1811, the parish was returned as containing 32 houses, and 171 inhabitants.

LLAN-ELLY, l. 3, *r.* 1811; l. 4, *r.* 862, and 3891; l. 16, add—This is one of the most thriving places in South Wales. It abounds with excellent coals and iron-ore, extensive iron-works, and also lead and copper works.

LLAN-GADOG VAWR, l. *ult.* *r.* 1811—1964; and add—378 houses.

LLANGOLLEN, l. 4, *r.* 1811; l. 5, add—those of the parish, comprehending three townships, amounted to 612, and the inhabitants to 2897.

LLANNERCH Y MEDD, l. 3, add—the parish of Amlwch contains, by the returns of 1811, 920 houses, and 4210 inhabitants.

LLAN RHAIDAR, col. 2, l. 6 and 7, *r.* 1811—1974; add—414 houses.

LLANRWST, near the clofe, *r.* 1811—2502, and 452 houses.

LLANSTEPHAN, col. 2, l. *ult.* *r.* 1811—997—221.

LLANTRISSENT, l. *ult.* *r.* 1811—246—2122.

LLANVYLLING, or LLANFYLLIN, l. *ult.* *r.* 1811; the parish of Llanyvilling contained 291 houses, and 1508 inhabitants.

LLANYDLOES. Add—By the return of 1811, the parish contained 470 houses, and 2386 inhabitants.

LLAUGHARNE, l. *ult.* *r.* 1561; and add—the number of houses was 283.

LOCHE. See COBITIS.

LOCKERBIE. In 1811, the whole parish of Dryfdale contained 369 houses, and 1893 persons; 904 being males, and 992 females.

LOGAN, l. 2, *r.* 11,591, including 2285 slaves in 1810.

LOGWOOD, *Chemical Properties of.* See HEMATIN.

LONCHURUS for LONGHIURUS.

LONDON, in *Geography*, a town of Rockingham county, in New Hampshire, having 1492 inhabitants.

LONDON Britain, a township of Chelster county, in Pennsylvania, having 404 inhabitants.

LONDONDERRY, in America, l. 5, *r.* 2766; l. 16, add—containing, in 1810, 637 inhabitants.—Also, three townships in Pennsylvania, one in Dauphin county, having 2411 inhabitants; *dele* the rest of the article, and add—the second in Chelster county, having 1164 inhabitants; and another in Bedford county, having 486 inhabitants.

LONDONGROVE, l. 2, *r.* 983.

LONG MEADOW, l. *ult.* *r.* 1036.

LONG Sweep, a township of Mercer county, in Pennsylvania, having 998 inhabitants.

LONGTOWN. In 1811 this township contained 173 houses, and 1579 persons; *viz.* 744 males, and 835 females; 169 families being employed in agriculture, and 147 in trade, manufactures, and handicraft.

LONGTOWN, a township of Ewallacy hundred, in the parish of Clodock, and county of Hereford, which, by the returns of 1811, contained 164 houses, and 844 persons; *viz.* 423 males, and 421 females: 124 families being employed in agriculture, and 40 in trade, &c.

LOO-CHOO. See LIEOU-KIEOU.

LOOE, EAST, l. 14, *r.* 1811—128—608.

LOOE, *West*, l. 13 and 14, *r.* 1811—92—433.

LOSTWITHIEL, col. 2, l. 17 and 18, *r.* 1811; for town *r.* borough and parish—132 houses, 825 inhabitants.

LOTTERLOCH, a town of Orleans county, in Vermont, having 101 inhabitants.

LOUDON, l. 3 and 4, *r.* containing 21,338 inhabitants, of whom 5157 are slaves.

LOVELL, l. 1, for York *r.* Oxford, add—containing 365 inhabitants.

LOUGHBOROUGH. In 1811 this parish contained 1128 houses, and 5400 persons; *viz.* 2612 males, and 2788 females: 186 families being employed in agriculture, and 847 in trade, manufactures, or handicraft.

LOUGHOR, a borough of Wales, in the county of Glamorgan and hundred of Swanefe, which in 1811 contained 112 houses, and 473 inhabitants.

LOUIS, ST., l. 23, add—St. Louis forms a district of Louisiana, and in 1810 contained 5647 inhabitants, of whom 740 were slaves.

LOUISA, in Virginia, l. 3 and 4, insert—11,900 inhabitants, of whom 6430 were slaves.

LOUISIANA. At the clofe, add—According to the census of 1810, Louisiana comprehends the districts of St. Charles, of St. Louis, of St. Genevieve, of Cape Girardeau, of New Madrid, and also the settlements of Hope Field and St. Francis, and also settlements on the Arkansas; and the number of inhabitants is stated at 20,845, of whom 3011 are slaves. See UNITED STATES.

LOUREIRA, in *Botany*, in memory of the venerable Father John de Loureiro, author of the *Flora Cochinchinensis*, who died about the year 1797, at Lisbon.—Cavan. *lc.* v. 5, 17. Willd. *Sp. Pl.* v. 4, 866. *Ait. Hort. Kew.* v. 5, 418.—Clafs and order, *Diocia Monadelphia*. *Nat. Ord. Tricocca*, Linn. *Euphorbia*, Juff.

Eff. Ch. Male, Calyx in five deep segments. Corolla bell-shaped, five-cleft. Stamens 8—13, connected at the base.

Female, Cal. and Cor. like the male. Capsule superior, two-lobed, two-celled. Seeds solitary.

1. *L. cuneifolia*. Cav. t. 429. Willd. n. 1.—Leaves obovate-lanceolate, partly three-lobed.—Native of Mexico. *A shrub*, with stalked aggregate leaves, and pale red flowers, from lateral buds.

2. *L. glandulosa*. Cav. t. 430. Ait. n. 1.—Leaves heart-shaped, fringed with glands. From the same county. *Stem* shrubby, forked, with forked axillary panicles of male flowers; the stalks of the female ones simple.

LOUTH, col. 3, l. 1, *r.* 1811; l. 3, *r.* 4728—976.

LOWER Alloway's Creek. Add—It contains 1184 inhabitants.

LOWER Chancesford, a township of York county, in Pennsylvania, having 818 inhabitants.

LOWER Dublin, l. 2, *r.* 2194.

LOWER Township, a township of Capeway county, in New Jersey, having 862 inhabitants.

LOWER Penn's Neck. Add—containing 1163 inhabitants.

LOWER Merion, a township of Montgomery county, in Pennsylvania, having 1835 inhabitants.

LOWER, for other articles under the denomination of, see MAHONTOGO, MOHAUS, MOUNT BETHEL, NAZARETH, CHICHESTER, DAREY, PROVIDENCE, OXFORD, SALFORD, SMITHFIELD, and WAKEFIELD.

LOWHILL, l. 2, *r.* 632.

LOYALSOCK, a township of Lyncoming county, in Pennsylvania, having 850 inhabitants.

LUÇON; col. 3, l. 5, *r.* Columbia; l. 12, ditto.

LUDGERSHALL, l. 3, 1811—this borough and parish—114—487.

LUDLOW, l. 29 and 30, *r.* 1811—851—4150.

LUDLOW, in America, l. 3, *r.* 730; l. 4, *r.* 877.

LULWORTH, EAST, l. 4, *r.* 81—382.

LUNENBURG,

LUNENBURG, in Virginia, l. 3, r. 12,261 inhabitants, of whom 7155 were slaves in 1810; l. 6, r. 744. Do. r. 1371.

LURGAN, l. 2, r. 874.

LUTON. In 1811 the parish contained 726 houses, and 3716 persons; viz. 1695 males, and 2021 females: 418 families being employed in agriculture, and 219 in trade and manufactures.

LUTTERWORTH, l. 16 from the bottom, r. 1811—410—1845.

LUZERNE, l. 5, r. 29; l. 8, r. 18,109; add—Also, a township of Fayette county, in Pennsylvania, having 1538 inhabitants.

LYCOMING, l. 5 and 6, r. 18—11,006; add—Also, a township in the said county, having 795 inhabitants.

LYCOPERDON. Add—See TULOSTOMA.

LYMAN, l. 5, r. 948; l. 7, add—with 1248 inhabitants.

LYME, l. 1, r. containing 670 inhabitants; l. 6, r. 4321.

LYME-Regis, col. 2, l. 8 and 7 from the bottom, r. 1811—1925—342.

LYMINGTON, l. 18 and 17 from the bottom, r. 1811—2641—534.

LYNDEBOROUGH, l. 4, r. 1074.

LYNDHURST, l. 24 and 25, r. 1811—192—1015.

LYNDON, l. ult. r. 1090.

LYNN, l. 5, r. 4087; add—Also, a township of Northampton county, in Pennsylvania, having 1497 inhabitants.

LYNN-Field, l. ult. r. 509.

LYNN-Regis, l. ult. r. 1811—2199—10,259.

LYONS, l. 38, after branches, add—The present manufactures of Lyons consist chiefly of cloths, of gold, silk, and silk, galloons, ribbons, and lace, and the produce of furriers, hatters, and bookfellers, besides those of the working of gold-thread, silk-weavers, dyers, &c. Col. 2, l. 26, add—some reckon the whole population at 150,000.

LYTHIODES. See MINERALOGY, *Addenda*

M.

MACCLESFIELD, l. 6 from bottom, r. 1811—2518—12,299; of whom 2458 families were employed, &c.; i. 3 from the bottom, for that period r. the return in 1800.

MACHIAS, l. 14, r. 1810—1570.

Vol. XXII.

MAC-INTOSH, in *Geography*, a county of Georgia, which, with its town Darien, contains 3739 persons, including in the county 2850, and in the town 107 slaves.

MACKEAN, a county of Pennsylvania, containing Ceres township, and 142 inhabitants.

MACPHERSON, col. 2, l. 29, for Lairy r. Laing.

MACROMETER, an instrument invented by Dr. Wollaston, for measuring directly the distance of inaccessible objects, by means of two reflectors, mounted as in a common sextant, but at a greater distance from each other.

MACROPODIUM, in *Botany*, from the *long foot*, or stalk, of its seed-vessel.—Brown in Ait. Hort. Kew. v. 4. 108.—Clasf and order, *Tetradynamia Siliquosa*. Nat. Ord. *Siliquose*, Linn. *Cruciferae*, Juss.

Eff. Ch. Pod linear, stalked. Cotyledons accumbent. Calyx erect.

1. *M. nivale*. Siberian Macropodium. Ait. n. 1. (Caramine nivalis; "Pallas It. v. 2. Append. n. 113. t. U. Willd. Sp. Pl. v. 3. 482.)—Native of Siberia, from whence it was procured for Kew garden, in 1796, by sir J. Banks. A hardy perennial, flowering in summer. *Herb* smooth, pale green, with oblong, toothed leaves; the radical ones stalked. *Flowers* small, white. *Pods* reflexed. *Willd.*

MACUACO, FLYING, of Pennant, in *Zoology*, the Lemur volans of Linnaeus; for an account of which, see GALEOPITHECUS volans.

MACUNGUY, l. 2, r. 2420.

MADBURY, l. 4, r. 684.

MADDERING, an operation performed in *Calico*-PRINTING; which fee.

MADDOX, l. 32, *dele* to that of St. Afaph; and for and from thence to r. that of Worcester.

MADELEY, l. 9.—In 1811, the parish contained 1026 houses, and 5076 persons; viz. 2502 males, and 2574 females: 18 families being employed in agriculture, and 747 in trade, manufactures, or handicraft.

MADISON, l. 4, r. 8381 inhabitants, of whom 3970 were slaves in 1810; l. 7, r. 11,587—3000. At the end, add—Also, a township of Maine, in Somerset county, having 686 inhabitants.—Also, a county of New York, containing 25,144 inhabitants, of whom 35 were slaves in 1810.—Also, a township of Ohio, in Guernsey county, having 249 inhabitants.—Another in Highland county, with 430 persons.—Another in Knox county, with 138 persons.—Also, a county of Ohio, containing six townships, and 1603 inhabitants.—Also, a township of Montgomery county, with 426 persons.—Another of Mulkingum county, with 426 persons.—Another of Pickaway county, with 406 persons.—Another of Butler county, with 1228 persons.—Another of Columbiana county, with 539 persons.—Another of Gallia county, having 170 inhabitants.—Another of Scioto county, with 307 persons.—Also, a town of Georgia, in Morgan county, having 124 inhabitants.—Also, a county of the Mississippi territory, having 4699 inhabitants, of whom 948 were slaves in 1810.—Also, a township of Clarke county, in the Indiana territory.

MADRID,

MADRID, in America. At the close, add—The district, by the census of 1810, contains 2103 inhabitants, of whom 287 were slaves.

MAD-RIVER, a township of Champaign county, in Ohio, having 1008 inhabitants.

MAGIC, SUPERSTITIOUS INFERT—has been supposed to consist ; in l. 2, infer after it—supposed ; l. 7, *dele* half.

MAGIC SQUARE, col. 5, l. 18 from bottom, *dele* and.

MAGNESIA, in *Chemistry*. According to the latest determinations, the weight of the atom of magnesia is 25, that of oxygen being 10 ; from this, the composition of its salts can be easily ascertained. See *ATOMIC THEORY*.

Separation of Magnesia from Lime.—We may take the opportunity of mentioning here an ingenious method of effecting this difficult chemical problem lately proposed by Mr. R. Phillips, and originally suggested, we believe, by Mr. T. Cooper. The two earths are to be reduced to the state of sulphate, and then well washed with a saturated solution of sulphate of lime, which readily dissolves, and thus separates the sulphate of magnesia, but which, from its being already saturated, can take up no more sulphate of lime.

MAGNESIAN LIME-STONE. See *MINERALOGY, Addenda*.

MAGNESITE. See *MINERALOGY, Addenda*.

MAGNESIUM, in *Chemistry*, the metallic basis of magnesia. See *MAGNESIA*.

MAGNOTS. At the end, add—See *MAINA*.

MAHBNING, a township of Northumberland county, in Pennsylvania, with 829 inhabitants.

MAHIM, for 17 miles N. of Bombay *r.* 7 miles N. of Bombay fort.

MAHONING. Add—In Indiana county, having 552 inhabitants.—Also, a township of Mercer county, in the same state, having 1316 inhabitants.

MAHONTOGO, *Lower and Upper*, two townships of Berks county, in Pennsylvania ; the former having 637, and the latter 489 persons.—Also, a township of Northumberland county, having 1608 inhabitants.

MAID, or MAIDEN. See *VIRGIN*.

MAID, in *Ichthyology*. See *SKATE*.

MAIDEN CREEK, in *Geography*, a township of Berks county, in Pennsylvania, having 918 inhabitants.

MAIDENHEAD, col. 2, l. 8, *r.* 1811—792—161.

MAIDENHEAD, in America, l. 4, *r.* 1810—1086.

MAIDSTONE, col. 3, l. 21, &c. *r.* 1811—9443 ; *viz.* 4412 males, and 5031 females : of whom 942 families are employed in trade and manufactures, and 437 in agriculture. The number of houses is 1706.

MAIDSTONE, in America, l. 2, *r.* 177.

MAINA, a district of the Morea, including that part of the country anciently called Laconia, that lies between the gulf of Messene and Gythium, bounded on the N. by the highest range of Taygetus, from which a chain of rugged mountains descends to Cape Matapan, the southern termination of the country. It is watered by Pamisus, now the Pirnetza, the broadest river of the Peloponnese. The plains round Calamata, a town towards the N.W., are fertile and well cultivated, abounding with the cactus, a prickly pear, the white mulberry affording food for great numbers of silk-worms, and various fruit-trees. The town is built on a plan that is well adapted for defending the inhabitants against the attacks of the pirates that infest the coast. The government of the Maina, in 1795, resembled that of the Scottish islands in former time. Over each district presided a capitane, whose residence was a fortified tower. Each chief, besides his own domain, received a tithe

from the produce of the land of his retainers ; and the different chiefs were independent of each other. Because the Mainots were reluctant to submit to the charach, or poll-tax, they had been repeatedly attacked by the Turks, but without success ; when an enemy appeared, the coast was immediately deserted, and the inhabitants retired to the strong holds of Taygetus. Expert also in the use of the rifle, besides the advantages of their situation, they have been able to defy the Turkish forces. Some of the chiefs were found by Mr. Morritt to be tolerably versed in Roman literature, and some capable of reading Herodotus and Xenophon. The laws of hospitality were observed amongst them with the strictest punctiliousness, and letters of recommendation secured to travellers a friendly reception. The religion of the Mainots is that of the Greek church, with all its mummery. Their women were never secluded nor enslaved, and therefore neither corrupted nor ignorant. They distinguished themselves by attention to domestic management, and the education of their children. Instances of conjugal infidelity were rare. In case of necessity, it is said that the Mainots can bring 12,000 men into the field. See *Walpole's Memoirs on Turkey*, &c. 1817.

MAINE, at the close, add—See *UNITED STATES*.

MAINOTS. See *MAINA*.

MAKFIELD *dele* : add—See *WAKEFIELD*.

MAKONGO, one of the states of Loango in Africa, of which Malemba is the port. The king of Makongo, or Malemba, resides inland at a town called Chingale, the Kinkale of the charts.

MALABAR, l. 11, add—The Malabar language prevails on the western coast of Cape Comorin, extending over Travancore and Malabar, formerly named Kérala, as far N. as Nilivara. See *TOOLAVA*.

MALCOMIA, in *Botany*, named in honour of Mr. William Malcolm, a celebrated cultivator, to whom the English gardens are much indebted.—Brown in *Ait. Hort. Kew. v. 4. 121*.—Class and order, *Tetradynamia Siliquosa*. Nat. Ord. *Siliqueose*, Linn. *Cruciferae*, Juss.

Eff. Ch. Pod nearly cylindrical, of two valves. Stigma simple, acute. Cotyledons incumbent, flat. Calyx closed.

This appears to us a very natural and well-defined genus, though hitherto confounded with *Cheiranthus*. The three species in *Hort. Kew. are*,

1. *M. maritima*. See *CHEIRANTHUS*, n. 14 ; a pretty annual, frequently and easily cultivated.

2. *M. africana*. (*Hesperis africana* ; Willd. Sp. Pl. v. 3. 532. *Leucium gallicum, folio halimi* ; Bocc. Sic. 77. t. 42. f. 1.)

3. *M. littorea*. See *CHEIRANTHUS*, n. 21. (*Leucium marium minus* ; Clus. Hist. v. 1. 298. f. 2.)

MALDEN, col. 2, l. 12, *r.* 1811 ; l. 13, *r.* 505—2659.

MALDEN, l. 4, *r.* 1384.

MALEMBO, or MALEMB. Add—See *MAKONGO*.

MALIC ACID, in *Chemistry*. See *SORBIC ACID*.

MALKOHA. See *PHENICOPIHEUS*.

MALLENDERS, a cutaneous disease, commonly confined to draught-horses ; it is an inflammation of the skin below the hock, producing cracks which discharge a fetid matter. For the cure of this disorder, owing to want of cleanliness and friction, the hair should be clipped, and the parts well washed with soft-soap and water ; and Mr. White recommends the following ointment : *viz.* a composition of 2 oz. of wax ointment, 1 oz. of olive-oil, oil of turpentine and camphor, of each 1 dr., and 2 drs. of acetated water of litharge. Mr. Ryding recommends a mixture of 1 oz. of strong quicksilver ointment, and 10 grs. of muriated quick-

silver

filter in fine powder. When this disease occurs above the knee, it is called *fallanders*.

MALLING, WEST, l. 6 and 7 from the bottom, r. 1811—1154—223. Add—In 1811, the number of houses in East Malling was 217, and of inhabitants 1256.

MALMESBURY, col. 2, l. 34, r. 1811; l. 35, 237—1152.

MALPAS. In 1811, the township contained 193 houses, and 938 persons; *viz.* 478 males, and 460 females.

MALTA, a town of the district of Maine, in the county of Kennebeck, having 468 inhabitants.

MALVERN, GREAT, l. 22 from the bottom, r. 1811—1205 inhabitants, occupying 204 houses.

MAMAT, ST. r. St. MAMOT.

MAMMALIA. *Dele* the account of the plates.

MAMMOTH, or MAMMONT, in *Natural History*. The name of mammoth has been given to two very different animals, whose remains are found in a fossil state; the first, which has been for ages called so by the Russians and Siberians, occurs abundantly on the north part of the ancient continent. It is a species of elephant, the ivory of which is so well preserved as to become an article of commerce. This animal, according to the researches of Cuvier, is a different species of elephant from that of India or Africa, resembling the former the moit. The American mammoth, as it has been called, belongs not only to a species distinct from the European mammoth, but from the Indian or African elephant, and from the form of its teeth must be even classed as a distinct genus; he has given it the name of *mastodon*. See *MASTODON*, *Addenda*.

Of the Russian *mastodon* very erroneous accounts have been published, particularly respecting its size. An animal of this kind having been discovered preserved entire in the ice, by a Tungustian fisherman in Siberia, was afterwards described by Mr. Adams; but, according to Cuvier, the great size attributed to it by that gentleman does not accord with the actual admeasurement of the bones, the head weighing, according to this account, four hundred pounds, which brings it nearly to the known size of the fossil elephant. The most remarkable fact stated by Mr. Adams is, that the animal was covered with two kinds of hair; the one red, which was both of a finer and coarser sort; the other was long, black, and bristly. This hair was very abundant. The fact proves two things of importance in the natural history of the mammoth, namely, that it was a different species from living elephants, and that it was sufficiently covered to enable it to live in cold climates. It is a commonly received tradition in Siberia, that these animals are frequently found entire in the ground, from whence the name of mammoth is derived, which signifies an animal that lives in the earth. According to Cuvier, these facts prove that the fossil elephant perished by a sudden revolution of the globe that destroyed the whole species, and which froze the individuals that were then in the northern regions; nor can any reason be advanced why these remains should not continue preserved in the eternal ice of those countries, till discovered by accident, or the hands of man. Those which were overtaken and buried in more southern climates are more decomposed, and their bones have become more or less friable; but this decomposition is the only change which they have undergone; they are neither broken nor rolled, and it may be clearly perceived that they perished where their bones are now found. Many bones of the same species of mammoth, or fossil elephant, have been discovered in different parts of England. We have seen a tooth, one of the molars of these animals, found near Whithy in Yorkshire, which measured seventeen inches round.

The greatest number of the teeth of the mammoth that have been examined resemble at first sight those of the Indian elephant; but, according to Cuvier, the structure, on more attentive observation, will be found somewhat different. In the living species of elephants, the size of the tusks varies with the species, the sex, and the varieties; and as they continue to grow during the life of the animal, age determines their dimensions more than any other cause. The tusks of the African elephant are larger than those of the Indian; they are harder, and preserve their whiteness better. According to Pennant, Mofambique furnishes tusks of living elephants ten feet in length, which are the largest that are known. The degree of curvature in the tusks differs as much as the size; some occasionally occur in a spiral form, and some in that of the letter S. We are unacquainted with the differences that might exist in the curvature of the tusks of the mammoth occasioned by difference of sex or other causes. Many of the tusks have the common degree of curvature, but others have much more curvature than occurs in any living elephants, approaching to a semicircle or half an ellipse divided through its transverse axis. Some tusks of the mammoth are formed spiral, like what sometimes occur among living elephants. The height of the mammoth did not greatly exceed that which the Indian elephants can attain. It is however certain from its remains, that the mammoth differed as much from the Indian elephant as the ass differs from the horse.

The bones of the mammoth, or fossil elephant, are generally found in alluvial soil, near the surface of the ground. They are seldom isolated, but generally mixed with bones of other quadrupeds of known genera; as the rhinoceros, the ox, the horse, and the antelope; and are often accompanied with the remains of marine animals, such as shells, parts of which are attached to the bones. Cuvier states that he has in his possession a jaw-bone covered with millepores and oysters.

The beds which cover the bones of the fossil elephant have seldom any great depth, and are scarcely ever composed of stone. They are rarely petrified, and only one or two instances are quoted where they were incruited with a shelly stone. Often they are only accompanied with fresh-water shells. Every thing appears, says Cuvier, to announce that the cause by which they were buried is one of the most recent that has contributed to change the surface of the globe. It was nevertheless a cause general in its operation, for these fossil bones of elephants are too numerous, and occur in countries too remote and uninhabited to allow us to suppose that they have ever been brought there by man.

The beds which contain and cover these remains show, that the cause by which the animals were destroyed was water, and in many instances the waters were the same as those of the present day, since they contained the same species of shell-fish. These bones are not waterworn, and therefore have not been transplanted from a distance.

The shells and millepores which adhere to them prove that they remained some time covered only with water. The different species of *mastodon*, the gigantic tapir, and the fossil rhinoceros, lived in the same countries as the fossil elephant, since their bones are found in the same beds and preserved in the same state. Every thing therefore leads us to conclude that the mammoth, or fossil elephant, is an extinct species, though it differs less from existing species than the other remains of quadrupeds that are found in the same situations. In a former part of this work, under the article *MEGATHERIUM*, the discovery of the fossil elephant described by Mr. Adams is more particularly given; but the animal is erroneously supposed to belong to another species

species than the elephant, and the tusks are called horns. (See MASTODON, MEGALONIX, and MEGATHERIUM, *Ad-denda*.) According to Pallas, there is scarcely a river from the Don or the Tanais to Tchutkoinofs in the banks of which the bones of the mammoth are not abundant, and two islands of great size near the mouth of the Indigerka seem entirely composed of these bones mingled with ice, sand, and the bones of the elk, rhinoceros, and other large quadrupeds.

Similar bones are found in Poland, Germany, France, Holland, and Hungary. We have before mentioned that they are found in various parts of England, and no where more abundantly than in the vale of Thames, particularly near Brentford. The teeth and bones have been generally found in alluvial soil over the chalk formation; but in Mr. Bakewell's Introduction to Geology, an instance is given of an entire skeleton having been found in a cavern in the mountain lime-stone near Wirksworth, in Derbyshire, in 1663. Its skull was so large that it is stated to have held four bushels of corn.

MANCHA, LA, l. 1 and 2, r. bounded on the N. by New Castile; *dele* north of.

MANCHESTER, l. 10, add—In 1811, the number of houses in Manchester and Salford was 16,353, and that of the inhabitants 98,573; 44,332 being males, and 54,241 females: of whom 19,639 families were employed in trade and manufactures, and 47 in agriculture.—l. 15, r. the whole population of which, including Manchester, was 138,349.

MANCHESTER, in America, l. 4, r. 1137; l. 7, r. 1502; l. 9, r. 1579; l. 10, r. 978; add—Also, a town of Hillsborough, in New Hampshire, containing 615 inhabitants.

MANÈGE, or MENAGE, denotes an academy, riding-school, or other place for learning to ride, and for breaking horses to their various motions and actions. Also, the exercise itself, or the art of riding, which teaches at the same time to form the horseman and the horse.

MANE-SHEET, in the *Manège*, a covering for the upper part of a horse's head, extending round his neck, with holes for the ears to pass through, and joining to the halter upon the fore-part of the head, and likewise to the surcingle, or long girth, upon the horse's back.

MANGANESE, in *Chemistry*. The specific gravity of manganese, according to Dr. John, is 8.013. A good deal of confusion still exists respecting the oxys of this metal. According to Dr. John, there are three oxys; the *green*, the *brown*, and the *black*. According to Berzelius, there are no less than five. Sir H. Davy could only obtain two, and Dr. Thomson agrees with him in concluding there are but two; namely, the *olive* or *protoxyd*, which combines with acids, and forms the common salts of manganese; and the *black* or *peroxyd*, which is found native. From the experiments of Dr. John and Berzelius, Dr. Thomson fixes the weight of the atom of manganese at 35, and of course that of its protoxyd at 45; from which data, if correct, the composition of its salts may be estimated. The following *erratum* exists in this article in the Cyclopædia. Col. 3, l. 16, for malars r. metals; also in the same col. paragraph 9, at the end of the sentence respecting iron, add—Berzelius has lately shewn, that manganese is a constituent of *cast iron*.

MANGÈ, a cutaneous disease, incident to many domestic quadrupeds, and attended with an eruption and loss of hair. Its causes, according to Mr. Ryding, are, sudden changes of temperature, hot stables, bad diet, and want of cleanliness. It is also communicated by infection, as when a found horse rubs himself against a stall, in which a mangy horse

had been kept. Its symptoms are, loss of flesh, without any apparent cause, a itching of the coat, and afterwards eruptions, discharging a thick yellowish matter, which forms a kind of scurf that peels off, and a falling off of the hair. The disorder, though partial at first, soon spreads all over the body, and is attended with an itching, which causes the horse to rub against every thing that comes in his way. It is said, that with attention to cleanliness, an ointment composed of 1 lb. of prepared hog's-lard, $\frac{1}{2}$ lb. of sulphur, 3 oz. of white hellebore in fine powder, and olive-oil in sufficient quantity, rubbed over the affected parts, and repeated after an interval of three days, will after two or three applications complete a cure. Some say, that if the animal's strength will allow it, the cure should be commenced with bleedings, and a ball formed of powdered nitre, powdered rosin, and castile soap, of each $\frac{1}{2}$ oz., 1 drachm of camphor in powder, and honey *q. s.* should be given in the evening. Attention should be paid to diet, exercise, and good grooming; the bowels should be kept in a proper state with mashes, in which 1 oz. of nitre is dissolved; the affected part should be well washed with a strong solution of soft-soap, and afterwards rubbed morning and evening with an ointment composed of 4 oz. of flowers of sulphur, 3 oz. of hog's-lard, and 2 oz. of quicksilver ointment. The ointment may be continued every other day, until the disease is removed. Two or three doses of mild physic are recommended, and then a ball made of Æthiops' mineral, crude antimony in powder, and cream of tartar, of each $\frac{1}{2}$ oz., and honey *q. s.* should be given every night for a month.

In a slight case, strong tobacco infusion with one-third part of stale urine, used for washing the affected parts, will be sufficient; but as an efficacious unguent, the following is recommended; *viz.* $\frac{1}{2}$ lb. of quicksilver ointment, 4 oz. of finely powdered brimstone, 2 oz. of black soap, $1\frac{1}{2}$ oz. of crude sal ammoniac, and oil of bays and turpentine *q. s.*; or tar, gun-powder finely pulverized, black soap, and oil of turpentine, of each about equal quantities; and the ointment may be washed twice a day with a lotion composed of $\frac{1}{2}$ oz. of muriated mercury (sublimate) in powder, diluted in $1\frac{1}{2}$ pint of boiling water; or muriated mercury, muriated ammonia (crude sal ammoniac), of each from two to three drachms, and three half pints of boiling water.

MANHEIM, l. 3, r. 1282; l. 5, r. 2207; add—Also, a township in Berks county, having 1354 inhabitants.

MANINGTREE, l. 18, r. 1811; l. 19, r. 1075—217.
MANNA, *Chemical Properties of*. Manna differs from sugar in several remarkable particulars. It dissolves very readily and abundantly in alcohol, and crystallizes on cooling. Nitric acid converts it partly into oxalic, and partly into saccharic acid. It does not ferment like sugar, and of course yields no alcohol. The common manna of the shops, according to Fourcroy and Vauquelin, consists of four different ingredients. Pure manna constituting about three-fourths of the whole—a little common sugar—a yellow matter with a nauseous odour, to which the purgative qualities of manna are chiefly owing—and a little mucilage, convertible into saccharic acid. Manna seems to be formed during the fermentation of many juices, such as the juices of the onion, melon, &c.

MANNINGTON. Add—containing, in 1810, 1664 inhabitants.

MANOR, l. 2, r. 2642.

MANSFIELD, l. 23, r. 1811—1427; l. 24, r. 6816.

MANSFIELD, in America, l. 3, r. 1810—2058; l. 6, r. 1030; l. 10, r. 38; l. 14, r.—In 1810 the number was 1810; l. 16, 2570.

MANTUA,

MANTUA, a township of Ohio, in Portage county, containing 243 inhabitants.

MARAZION, l. 15 and 13 from bottom, r. 1811—184—1022.

MARBLEHEAD, l. 4, r. 5900.

MARECHAUSSES, denoted, under the French monarchy, several small bodies of troops, composed of officers and soldiers who had been in service, that continued stationary in the principal towns, for the purpose of aiding the civil magistrate. That in Paris consisted of three companies; *viz.* the company belonging to the "Lieutenant criminel de Robe au Courte," or to that particular court of judicature which was superintended by the provost de la Marechauffée; and which Charles IX. attached to the gendarmerie; and the independent company of mounted police, called "Guet à Cheval;" and the company of the police or foot patrol, called "Guet à Pied," which was again subdivided into two companies, in order that one might do the duty of the quays. These companies were under the immediate direction of the secretary of state for the interior department of Paris.

MARGARIC ACID, in *Chemistry*. This acid exists in the form of pearly scales; hence the name. It was first described by Chevreul, who obtained it by digesting a soap made of hog's-lard and potash in water. Part of the margarate of potash was dissolved, while another part was deposited in the form of pearl-coloured scales. The potash was afterwards removed by muriatic acid, and thus the margaric acid obtained in a state of purity. Margaric acid is pearl-white. It is tasteless, and emits a smell something like white wax. It melts at a temperature of 134°, and crystallizes on cooling into beautiful brilliant white needles. It is insoluble in water, but very soluble in alcohol. It reddens vegetable blues very readily, and combines with all the bases, especially with the alkalies and alkaline earths, forming *salts*, or rather *soaps*. Dr. Thomson, from the experiments of Chevreul, fixes the weight of the atom of this acid at 330.

MARGATE, col. 3, l. 9, r. 1811; l. 10, r. 6126—1229.

MARION, l. 2, r. 8884—2771.

MARK ISLAND, a township of Hancock county, in the district of Maine, with few inhabitants.

MARLBOROUGH, col. 2, l. 8 from the bottom, r. 1811—2579; l. 7, r. 445. Col. 3, l. 24, after lady Jane, *dele* unhappily for herself; l. 27, after favourite, r. who died in child-birth of Edward VI.; *dele* who was destined to suffer the fate of her predecessor.

MARLBOROUGH, in America, l. 4, add—containing 4996 inhabitants, of whom 1709 were slaves in 1810; l. 7, r. 1674; l. 12, r. 1810—1245; l. 14, r. 1112. Col. 2, l. 1, r. three; l. 2, after Pennsylvania, r. one in Montgomery county, having 672 inhabitants; and E. and W. Marlborough, in Chester county; the former having 1046, and the latter 917 inhabitants.—Also, a town of Hartford county, in Connecticut, having 720 inhabitants.—Also, a township of Delaware county, in Ohio, containing 177 inhabitants:—l. 5, r. 1832.

MARLOW, GREAT, col. 2, l. 16 and 17, r. 1811—225—1166 persons; add—and its borough to contain 468 houses, and 2799 inhabitants; l. 20, add—in a parish of the same name, which contains 140 houses, and 730 inhabitants.

MARLOW, in America, l. 2, r. 564.

MARPLE, a township of Delaware county, in Pennsylvania, having 649 inhabitants.

MARSELLOIS, *The*, or *Marcellus Hymn*, a national

march, adopted by the French during the course of the Revolution, and regularly played in their armies when they went to battle. It was frequently accompanied, or rather succeeded by the "ça ira," a lively tune; the former being calculated for slow or ordinary time, and the latter for quick movements. Both are now profcribed.

MARSHFIELD, l. 25, r. 1811—272; l. 26, r. 1415.

MARSHFIELD, in America, l. 4, r. 1364; l. 6, r. 513.

MARSHPEE, l. 3, r. 139.

MARTELO, or MORTELLO, *Towers*, denoting small castles erected for the defence of a coast; such are those of Romney Marsh, of the island of Jersey, Halifax in Nova Scotia, &c. Grose derives the term mortello, from *morta*, whence *mota* or *moat*, which formerly signified a castle. Others derive it from the Italian "sonare in campana a martello," to sound the alarm bell, which, in some parts of Italy, is struck by hammers. In old French, the word signifying the same thing, (now *marteau*) was *martel*, and *martel en tête* was the adage for the rumour of annoyance or alarm.

MARTOCK, l. 2, r. 1623.

MARU. Add—This was the ancient capital of the province of Margiana, founded by Alexander the Great, and afterwards embellished by Antiochus Nicator, who called it Antiochia. It was one of the four imperial cities of Khorassan; its fruits were finer than those of any other place, and the walls were on all sides surrounded with stately palaces, groves, and gardens. It was taken and pillaged by the Uzbeks about 25 years ago; since which time, it has gradually declined, and the population is now reduced to 3000 souls, under the government of Hyder Shah of Bokhara. The revenues of the khan are 20 maunds of grain, and 60,000 rupees annually. It is 88 furlongs from hence to Herat. *Dele* the next article.

MARY, queen of Scotland, l. 2, insert (or 7th). Col. 2, l. 29, after their own, add—This article, says Mr. Chalmers, (*vbi infra*) denuded the Scottish queen, who was heir-prefumptive to the crown of England, of all future pretensions to the crown. The stipulation, he says, ought to have been, not *in all times coming*, as expressed in the article, but *during the life of Elizabeth*. Considering, moreover, the defective powers of the French negotiators to treat of a matter of that importance, in addition to the wording of the clause, these circumstances created an insuperable objection to the ratification of such a treaty; which treaty was never ratified by the Scottish queen, or by any person under her authority. Col. 4, l. 8, for He r. Darnley; l. 20.—We know for certain, says Mr. Chalmers, that the king was murdered by Murray's faction, and that Morton, Bothwell, and Maitland, were the eminent characters who were attainted by parliament for the deed, though many inferior persons, and some of the innocent, were tried and punished for the same crime. But the queen, he says, as she was not one of that faction, was not guilty; and every attempt of Robertson and Laing to establish her privy to this transgression has failed. Col. 6, l. 28, after employers, add—Queen Elizabeth, it has been said, wished to have had Mary put to death privately by poison or by assassination, and actually suggested and expressed her wishes to this purpose, and she thus acted suitably to the declaration made by her on Palm-sunday 1572; *viz.* "that the queen of Scots' head should never be quiet." At length, when her dark hints or more explicit instructions, communicated to Paulet and Drury her keepers, had failed of producing effect, preparations, &c.; l. 29, after publicly, add—but the privy-counsellors differed in their opinion

opinion concerning the law by which she should be tried, whether it should be the statute of treasons, (25 Edw. III.) or a late act of the 27th of Elizabeth, which had been made for this special occasion. However, the last opinion prevailed. At the close, add—Chalmers's Life of Mary, Queen of Scots, vol. i. 4to. 1818.

MARY, *St.* col. 2, l. 8, r. 12, 794; l. 9, 6000; l. 13, add—in the county of Camden, which see.

MARYLAND. Add—See UNITED STATES.

MARYPORT, col. 2, l. 5 and 6, r. 1811—322—3134.

MASHAM, l. 7, r. 1811—213—1014.

MASOLES, the name of a militia in Croatia, which is bound to march to the frontiers whenever there appears the least symptom of hostile disposition on the part of the Turks. The private soldiers have lands allotted to them, which they cultivate for their own use, but receive no pay from the public. The officers are paid.

MASON, l. 7, r. 1077.

MASSACHUSETTS. Add—See UNITED STATES.

MASTODON, in *Natural History*, a large quadruped, whose bones are found in a fossil state. It was for a long time confounded by naturalists with the mammoth or fossil elephant. (See MAMMOTH, *Addenda*.) Cuvier has ascertained, that the mastodon is not only a distinct animal from the mammoth and the living species of elephants, but that it must be classed as a new genus. Five species of this genus have been at present discovered.

The *great mastodon*, or the animal of the *Ohio*, the bones of which have been found in the greatest abundance near the Ohio river, in the province of Kentucky, in North America, bears a considerable degree of resemblance to the elephant in its tusks and general osteology, the form of the grinders excepted. It had probably a trunk, but this part being more perishable than the bones has not been discovered. Cuvier concludes from its general structure, that it could not have fed itself without the aid of a trunk. Its height did not surpass that of the largest elephant, but its body was longer, and its members were somewhat thicker; its belly was less extended than that of the elephant. Notwithstanding the general resemblance, the structure of the grinders is so different, as to entitle us to class it as a different genus. It fed itself nearly in the same way as the hippopotamus and the wild boar, on the roots and pulpy parts of vegetables; and this kind of food would naturally lead it to moist and marshy ground; but it was not made for swimming, or living under water, like the hippopotamus, but was really a land animal. Its bones are more common in North America than elsewhere, and are more fresh and better preserved than any other known fossil bones. Yet there is not the least reason to believe, according to Cuvier, that there are any living mastodons either in America or elsewhere. The most celebrated place where the remains of the mastodon occur is called *Big-bone Lick*, on the south-east of the Ohio, five miles from the river, and thirty-six miles below the entrance of the Kentucky river, and nearly opposite the great Miami. The place where they occur is a salt marsh surrounded by hills. The bottom of the marsh is a black and fetid mud. The bones are found in the mud and on the borders of the marsh at about four feet below the surface, but they occur also in various parts of North America in marshy situations. In 1805, many bones of these animals were found in the county of Wythe, in Virginia, about five feet under the earth, upon a bed of lime-stone. One of the teeth weighed seventeen pounds. But what renders this discovery the more remarkable is, that a mass of half-ground branches, roots, and leaves,

included in a kind of sack, supposed to be the stomach, was found in the midst of these bones, so as to leave no doubt that these were substances that the animal had devoured. Among the vegetable matter in this sack were distinguished the remains of some plants known in Virginia. The bones of the great mastodon may be said to be common in North America; two nearly entire skeletons were collected by Mr. Peale; one of the largest is preserved in the Museum of Natural History at Philadelphia, the smaller was exhibited in London a few years since. These bones are scarce in other parts of the world; but wherever they have been found, it is at no great depth under the soil, and yet they are but little decomposed. They are not rounded by attrition, and offer proofs that they have not been removed from the places where the animals died. The skeletons found near the river called the great *Osages* were nearly in a vertical position, as if the animals had simply sunk into the mud and been buried there. According to a letter from Mr. Smith Barton, professor at the university of Pennsylvania, to M. Cuvier, "An intelligent traveller had seen near that river thousands of these bones, and had collected seventeen tusks, some of which were six feet in length, and a foot in diameter; but the greater part of these bones was much decomposed." Mr. Barton sent a grinder to M. Cuvier, so that no doubt can be entertained that the bones belonged to the mastodon. No remains of marine shells have been discovered with the bones of the mastodon, as is the case with those of the mammoth. Mr. Barton thinks, that the salt water of the marshes where they are found has contributed to the preservation of the bones. He states also two instances which appear to prove that from time to time the soft part or flesh of these animals has been dug up; a circumstance which, from the heat of the climate, is much more astonishing than what is stated of the flesh of the mammoth and rhinoceros being found in Siberia. (See MAMMOTH.) The Indians, who discovered five skeletons in 1762, relate, that one of the heads had a long nose above the mouth; Mr. Barton supposes that this was in fact the trunk. Kalm, in speaking of a great skeleton discovered by the savages in a marsh in the Illinois country, says, that the form of its *beak* was still discoverable, though half decomposed; it is probable that this was the root of the trunk.

Some doubts exist whether the mastodon be really an extinct genus, and whether it may not be found living west of the Missouri. The Indians of Virginia, according to Mr. Jefferson, say, that a troop of these formidable beasts destroyed the deer, buffaloes, and other animals created for their use; when the great man above destroyed them all with his thunder, except the largest male, which presenting its head to the thunder-bolts threw them off as they fell, but being at last wounded in the side, it fled towards the lakes, where it lives to this day.

The skeleton of the great mastodon exhibited in England was near eleven feet high. From the size of detached bones, Cuvier conjectures that the animal never exceeded twelve French feet, but its body was much longer in proportion than that of the elephant.

The form of the crown of the molars or grinders is nearly rectangular. The substance of the teeth is of two kinds only, the inner or osseous part, and the outer or enamel, which is very thick, and has no kind of cement or cortical. This very important difference joined with the form brings this animal nearer to the hippopotamus and the pig, than to the purely herbaceous animals like the elephant.

The crown of the grinders is divided by deep open furrows into a certain number of transverse ridges, and these ridges

ridges are again divided into two large irregular pyramidal obtuse points, a little rounded. The crown therefore is studded with these pyramidal points disposed in pairs; it is however very different from the teeth of carnivorous animals, which have only one principal longitudinal furrow divided into lesser indentations, like a faw. The teeth of the elephant have on the crown several little transverse walls, divided into a number of small tubercles, and these grow flat early, whereas the tubercles or cones on the tooth of the mastodon being much larger, the crown remains long mamillated. It was this circumstance of the grinders being studded with points that gave rise to the opinion of the mastodon being carnivorous.

The number of grinders, according to Cuvier, are six on each side, three above and three below.

The structure of the jaws indicates that the mastodon had tusks like the elephant or morse. The number of tusks which occur with the teeth further confirms this opinion. A skull was found by Mr. Peale which proves this fact, being furnished with alveoles. The curvature of the different tusks varies as much as in those of the elephant; but M. Cuvier thinks there is no ground for believing with Mr. Peale, that the tusks turned downwards.

The head of the mastodon being of vast size, and rendered exceedingly heavy by the teeth and tusks, which carried the centre of gravity far from the point of support, the neck was therefore necessarily short, like that of the elephant; so that without a trunk it could not have reached the ground with its mouth. Its tusks would also have deprived it of the power of eating on the ground; it is therefore certain that it must have had a trunk like that of an elephant.

From the remains of the mastodon, it appears there were five species, all of which are believed to be extinct.

1. *The great mastodon* that we have been describing.
2. *The mastodon with narrow grinders.* The remains of this species have been dug up at Semore, and many other places in Europe, and also in America.
3. *The little mastodon with small grinders.* This species is much less than the preceding, and was found in Saxony.
4. *Mastodon of the Cordilleras.* This species was discovered in South America by Humboldt. Its grinders are square, and it appears to have been equal in size to the great mastodon.
5. *Humboldean mastodon.* This, which is the smallest species of the genus, was found in America by Humboldt. These five species may be considered as forming a distinct and hitherto unknown genus.

The following are the dimensions of the skeleton of the great mastodon found by Mr. Peale, and placed in the Museum of Natural History in Philadelphia.

	Feet	Inches
Height over the shoulders - - -	11	0
Do. over the hips - - -	9	0
Length from the chin to the rump - - -	15	0
From the point of the tusks to the end of the tail, following the direction of the curve	31	0
In a straight line - - -		
Width of the hips and body - - -	5	8
Length of the largest vertebra - - -	2	3
Of the longest rib - - -	4	7
Of the tusks - - -	10	7
Circumference of one tooth - - -	1	6½

The weight of the whole skeleton is 1000 lbs.

MATHEWS, in *Geography*, a county of Virginia, containing 4229 inhabitants, of whom 2098 were slaves in 1810.

MATHIOLA, or rather MATTHIOLA, in *Botany*, Brown in Ait. Hort. Kew. v. 4. 119. See our former

article. Mr. Brown has restored this meritorious name, to designate a new genus of his own, extracted from the more hoary kinds of CHEIRANTHUS. (see that article,) n. 16, 17, 20, 24, 31, 28, and 15. We allow a difference of habit, but scarcely perceive a sufficient character.

MATLOCK, l. 14, r. 1811—523—2496.

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MAURICE, l. 4, add—The town contains 2085 inhabitants.

MAURY, a county of West Tennessee, containing 10,359 inhabitants, of whom 2626 were slaves in 1810.

MAWS, St. In 1811, the parish of St. Just contained 272 houses, and 1639 persons; viz. 751 males, and 888 females: 72 families being employed in agriculture, and 99 in trade, manufactures, and handicraft.

MAYOMBA, or MAJUMBA, *Cape*, a cape on the coast of Africa, in S. lat. 3° 34'. E. long. 11° 13' 36".

MEAD, a township of Crawford county, in Pennsylvania, containing 786 inhabitants.

MEADVILLE, l. 5, after houses, add—457 inhabitants.

MECKLENBURG, l. 2, r. 18,453 inhabitants, of whom 16,264 were slaves in 1810; l. 6 and 7, r. 14,272—3494.

MECONIC ACID, in *Chemistry*. See MORPHIA, and OPIUM.

MECRAN, or MEKRAN. At the end, Kidge or Kej, add—The population of Mekran is formed of many different tribes and independent chiefs, of which the Balouches are the most numerous; a middle-sized race of men, spare, muscular, and active, and armed with a match-lock, sword, shield, and dagger. The common language of the country is a corrupt Persian, mixed with Scindi, and the Balouches in general are of the Soonee persuasion. Those of the central territories reside mostly in towns; those of the lower countries are scattered over the plains, in hamlets of eight or ten huts, built of branches of palm, and covered with mats. The Balouches take, in general, but one wife, and their chiefs four; they are said to have great influence in the disputes of their tribes. The women of Mekran are allowed to appear indiscriminately in public. Mekran was formerly under the dominion of Nasser Khan, the chief of Kelat; but since his death, in 1795, the authority of his son has ceased, and of the dominions of his father he only retains possession of the fort of Kej. The whole force of the country, it is thought, may amount to about 25,000 men, whom it would be impossible to collect or to induce to concur in action. The revenues of this country are trifling.

MEDFIELD, l. 3, r. 786.

MEDFORD, l. 6, r. 1443.

MEDICAL ELECTRICITY. Since our remarks on *medical electricity* (see *Medical Electricity*) were written, a method has been announced, in some degree new, of exhibiting this remedy, which we shall very briefly notice here. This consists in employing a jar coated on the outside with paper tinsel, and instead of a coating on the inside, having only a spiral coil of wire in contact with its surface. On making the experiment, we find the shock is modified and softened by this contrivance. It appears, therefore, much better adapted for administering what is commonly called *vibratory shocks*, (that is to say, small shocks in very quick succession,) than the jar commonly used for the purpose. We omitted to mention that this method of exhibiting electricity (called *vibratory*) is commonly practised by electricians, chiefly from its requiring

requiring a very small apparatus, and from its being at the same time equal, or nearly so, in effect to a large current of fluid produced from a very powerful machine.

MEDOMAN, in *Geography*, a town of America, in Maine, and county of Lincoln, having 121 inhabitants.

MEDULLIN, in *Chemistry*, a name given by Dr. John to the pith of the *sunflower*, the *syrynga vulgaris*, &c. and which, according to him, is distinguished by the following properties. It is insoluble in water, alcohol, ether, and oils. It has neither taste nor smell. It is soluble in nitric acid; but instead of forming suberic acid, furnishes a quantity of oxalic acid. Its fracture is peculiar, and when burnt it leaves a charcoal having a metallic bronze-like appearance.

MEDWAY, in America, l. 4, r. 1213.

MEERSCHAUM. See MEERSCHAUM, and MINERALOGY, *Addenda*.

MEGALONIX, in *Natural History*, an extinct species of quadruped, about the size of an ox, whose remains were first discovered in Virginia. It was supposed by Mr. Jefferson to be allied to the lion, and hence received its name. According to Cuvier, however, the megalonix and megatherium are nearly allied, and may be considered as belonging to the same genus, which may be placed between the sloth and the ant-eaters, but nearer to the former than the latter. The remains of these animals have hitherto been found only in America, where sloths and ant-eaters at present exist. See MEGATHERIUM, *Addenda*.

MEGATHERIUM. (See MEGATHERIUM.) The animal described in the former part of that article, whose remains were found in Siberia, and noticed by Mr. Adams, was not the megatherium of Cuvier, but the fossil or extinct elephant. (See MAMMOTH, *Addenda*.) The megatherium was of the size of the rhinoceros; its fossil remains have hitherto been found only in South America. The first and most complete skeleton was sent from Buenos Ayres in the year 1789. It was found in digging in alluvial soil, on the banks of the river Luxten, a league S.E. of the village of that name, and three leagues W.S.W. of Buenos Ayres. A second skeleton was sent from Lima to Madrid in the year 1795; and a third was found in Paraguay. This animal differs from the megalonix chiefly in magnitude, being much larger. See Cuvier's description in the latter part of the article MEGATHERIUM.

MEGIDDO, or MEGEDO, in *Scripture Geography*, a city of Manasseh (Joh. xvii. 11. Judg. i. 27.), famous for the defeat of king Josiah. (1 Kings, xxiii. 29, 30.) Herodotus, speaking of this victory, says, Necho obtained it at Magdolor, lib. ii. cap. 159.

MEIGS, in *Geography*, a township of Adams' county, in Ohio, having 835 inhabitants.

MEKRAN. See MEKRAN.

MELDRUM. In 1811, the parish of Old Meldrum contained 411 houses, and 1635 persons; viz. 736 males, and 919 females: 345 families being employed in agriculture, and 86 in trade, manufactures, and handicraft.

MELFORD, LONG, l. 5 and 6, r. 1811—415—2068—951—1117.

MELLIT, in *Ferriery*, a dry scab growing upon the heels of the forefoot of a horse, which is cured by a mixture of half a pound of common honey, and a quarter of a pound of black soap, with four or five spoonful of vinegar, half an ounce of finely powdered alum, and two spoonful of fine flour, applied to the affected part, after removing the hair, like a plaster, and suffered to remain five days. If the cure be not completed, the leg, foot, and fore, should be washed, and the same application repeated.

MELMOTH, col. 2, l. 20 and 21, r. thus—The author of 'The Pursuits of Literature' says, "Mr. Melmoth is a happy, &c."

MELROSE, l. 12. In 1811, this parish contained 538 houses, and 3132 persons; viz. 1531 males, and 1601 females: 239 families employed in agriculture, and 251 in trade, &c.

MELTON-MOWBRAY, l. 24 and 25, r. 1811—451—2115.

MENALLEN, a township of Fayette county, in Pennsylvania, having 1228 inhabitants.

MENANGEEBOW, for MENANGEBOW.

MENDHAM. Add—containing 1277 inhabitants.

MERA, l. 14 from bottom, after Linga, add a comma.

MERCER, after acres, add—16 townships, 8277 inhabitants; l. 6, 11, 587 inhabitants, of whom 3000 were slaves in 1810.—Also, a township of Mercer county, having 262 inhabitants.—Also, a township of Butler county, in Pennsylvania, having 588 inhabitants.—Also, a township of Maine, in Somerset county, having 562 inhabitants.

MERCURY, p. 12, col. 2, l. 12 from bottom, for Todd r. Thomfon.

MERCURY. This metal boils, according to Crichton, at 566°; according to Heinrich at 684°. These differences respecting the boiling point of this metal, as well as those mentioned in the original article, probably arise in part from the mode in which the thermometers employed were graduated. See further on this subject under HEAT.

There are but two oxys of mercury known, and not three, as stated in the Cyclopædia, the *black* or *protoxyd*, and the *red* or *peroxyd*; the first of which, according to Dr. Thomfon's recent determinations, is a compound of 100 mercury + 4 oxygen; and the second, 100 mercury + 8 oxygen. Hence the weight of an atom of this metal will be 250, and from this the composition of its salts may be deduced. (See ATOMIC THEORY.) What has been said in our original article respecting *calomel* and *corrosive sublimate*, formerly termed *submuriate* and *oxymuriate* of mercury, is now to be understood, according to the present views of their composition, as applicable to the *protochloride* and *perchloride* of mercury. See further on this part of the subject under CHLORINE.

MERDIN, l. 7. Its inhabitants amount to nearly 11,000 souls; l. 9, add—their number is supposed to be 1500, having several churches, and a patriarch, and besides here are 200 Jews, and also Turks, Arabs, and Kurds. At the end, add—it is 46 furlongs from Diarbekr. It is the frontier of the pachalic of Bagdad, towards Constantinople, and under the government of a Muffelem, appointed by the pacha.

MEREDITH, l. 4, r. containing 1940 inhabitants.

MERIDEN, a town of New Haven county, in Connecticut, having 1249 inhabitants.

MERION, l. 3, r. 1156—1835.

MERIONETHSHIRE, col. 5, l. 37 and 38, r. 1811—6022—30,924—14,308—16,616—3619—1270.

MERRIMACK, l. 3, r. 1048.

MERTHYR-TYDVIL, col. 2, l. 30, add—in its five hamlets, by the parliamentary returns of 1811, is stated to amount to 11,104 persons, occupying 2264 houses.

MERTON, l. 4, r. 1811; l. 5, r. 135—905.

MERU-SHAH-JEHAN. See MARU.

MESCHID, MASCHID, or *Mesched*, l. 1, insert—the capital of the Persian division of the province of Khorassan, situated about two furlongs from the ruins of the ancient city of Tous, and celebrated for a very superb sepulchre, containing the relics of Imam Reza, and those of the caliph Haroun ul Rufchid. This city, though a great part of it

it is in ruins, has a population of 50,000 souls. The bazaar is well supplied with fruits and provisions, from the fertile plain on which the city stands. It is surrounded with a strong wall, three furlongs in circumference, and the great bazaar is three miles in length. The city is governed by one of the king's sons, and with the districts belonging to it yields a revenue of 90,000 tomanas. It carries on a considerable trade with Bokhara, Bulkh, Candahar, Yezd, and Herat. Velvets of the finest quality are manufactured here; and its fur pelisses are most esteemed.

MESHED. See MESCHID.

MESIED *Ali*. See NEIFF.

METAL, in *Geography*, a township of Franklin county, in Pennsylvania, having 1236 inhabitants.

METALS, in the *Materia Medica*, col. 2, l. 24, for Todd *r.* Thomson.

METEORIC IRON. See MINERALOGY, *Addenda*.

METHERVAN, in *Geography*, a town of Essex county, in Massachusetts, containing 1181 inhabitants.

METHWOLD, col. 2, l. 4, *r.* 1811—942—174.

METROXYLON, in *Botany*, a name given by Rottboll, in the Copenhagen Transactions, to the true Sago Palm, described from Dr. Kenig's manuscripts, by Mr. Charles Konig, in *Ann. of Bot.* v. 1. 195. t. 4. This genus appears to differ from Gærtner's SAGUS, (see that article,) in having a *corolla*; which is monopetalous and three-cleft. See SAGO.

MEXICO, col. 15, l. 21 from bottom, add—The industrious researches of the ingenious and philosophical traveller M. Humboldt have established the remarkable fact, that in the whole of the New Continent, there is nothing which indicates the existence of alphabetical writing, nor any very near approach to it. Although the use of hieroglyphic paintings was common among the Toltecs, Aztecs, and other tribes, which, since the seventh century, have appeared successively on the elevated plain of Anchuac, Humboldt suggests, that the progressive perfection of symbolical writing, and the facility with which objects were painted, prevented the introduction of letters. It is alleged, that they have done so for a much longer time with the Chinese.

MIAMI, a township of Clermont county, in Ohio, containing 1670 inhabitants.—Also, a township of Greene county, in Ohio, having 794 inhabitants.—Also, a township of Hamilton county, in Ohio, having 495 inhabitants.—Also, a county of Ohio, containing 6 townships, and 3941 inhabitants.

MICHIGAN. Add—The territory of Michigan includes four districts, *viz.* Detroit, Erie, Huron, and Michilimackic, and by the census of 1810, 4702 inhabitants, of whom 24 were slaves.

MICKLEHAM, col. 2, l. 1, *r.* 1811; l. 2, 416 persons, occupying 54 houses; l. 3, 190—226.

MICROPETALUM, in *Botany*, from the *smallness* of the petals.—“*Perf. Syn.* v. 1. 509.” Pursh 319. (*Spergularium*; Michaux Bor.-Amer. v. 1. 275).—Clafs and order, *Decandria Tetragynia*. Nat. Ord. *Caryophyllei*, Linn. Juff.

Eff. Ch. Calyx of five spreading leaves. Petals five, minute, undivided; or wanting. Stigmas four, sessile. Capsule ovate, longer than the calyx, of four valves.

1. *M. lanuginosum*. Mich. n. 1.—Densely downy. Flower-stalks solitary. Petals none.—On the mountains of Virginia and Carolina, perennial, flowering in June and July. Leaves lanceolate, tapering down into a footstalk.

2. *M. lanceolatum*. Mich. n. 2.—Smooth. Leaves lanceolate, tapering at each end. Flowers panicled. Petals

ovate, very short.—On moist rocks, from Canada to Pennsylvania, perennial, flowering in July. *Stigmas* sometimes only three. *Michaux*.

3. *M. gramineum*. Mich. n. 3.—Very smooth. Leaves linear. Panicle terminal, lax, slender. Petals lanceolate, as long as the calyx.—About springs and shady rocks, from New York to Virginia, perennial, flowering in June and July. *Pursh*. Resembles *Stellaria gramea*. *Michaux*.

Mr. Pursh speaks of *Arenaria fasciculata* as probably belonging to this genus, but we know not whether he intends the plant of Linnæus, or of Jacq. *Austr.* t. 182; see *Engl. Bot.* t. 1744.

MIDDLEBOROUGH, l. 3, *r.* 4400.

MIDDLEBURY, l. 6, *r.* 2188; add—Also, a town of New Haven, in Connecticut, having 847 inhabitants.

MIDDLEFIELD, l. 3, *r.* 822.

MIDDLE HERO, a township of Grand Isle county, in Vermont, having 623 inhabitants.

MIDDLESEX, col. 2, l. 4, *r.* 1811—130,613 houses, 953,276 inhabitants; *viz.* 434,633 males, and 518,643 females: of whom 135,398 families are employed in trade and manufactures, and 9088 in agriculture.

MIDDLESEX, in America, l. 5, *r.* 44; l. 6, *r.* 52,789. Col. 2, l. 9, *r.* 8—20,723; l. 10, *r.* 57 were slaves in 1810; l. 14, *r.* 20,383; add—Also, a township of Chittenden county, in Vermont, having 401 inhabitants.—Also, a township of Butler county, in Pennsylvania, containing 568 persons.

MIDDLETON, l. 3, *r.* 541; l. 8, after houses, add—2014 inhabitants.

MIDDLETON, except the city, a township, containing 3368 inhabitants.—Also, a township of Columbiana, in Ohio, having 579 inhabitants.

MIDDLETON, col. 2, l. 23, *r.* 1811; l. 24, *r.* 4422 persons, occupying 805 houses.

MIDDLETOWN, l. 3, add—containing 439 inhabitants; l. 4, add—having 1207 inhabitants; l. 7, *r.* 976; l. 17, *r.* 3849; l. 33, after county, add—containing 948 inhabitants; l. 34, after Cumberland, add—having 2351, and the third in Bucks county, having 1462 inhabitants.

MIDDLEWICH, col. 2, l. 10, *r.* 1811; l. 11, 279—1232.

MIDHURST, l. 8, *r.* In 1811, the borough and parish contained 1256 persons, occupying 196 houses; 60 families being employed in agriculture, 127 in trade and manufactures.

MIEMITE. See MINERALOGY, *Addenda*.

MIFFLIN, l. 4, *r.* nine; l. 9, *r.* this county contains 12,132. Add—Also, a township in Alleghany county, in Pennsylvania, containing 637 inhabitants.—Also, a township of Ross county, in Ohio, with 445 inhabitants.

MILBORNE PORT, col. 2, l. 7, *r.* 1811, l. 8, *r.* population of this borough and parish amounted to 1000 persons, occupying 224 houses; 474 being males, and 526 females: of whom 132 families were employed in trade, and 78 in agriculture.

MILDENHALL, l. 25, *r.* 1811; l. 26, *r.* 2493, occupying 351 houses; 1187 being males, and 1306 females:—278—112.

MILFORD, col. 3, l. 39, 40, *r.* 1811—1961, the number of houses being 352.

MILFORD, in America, l. 2, containing 2095 inhabitants; l. 3, 973; l. 11, containing 2033 inhabitants; l. 18, and 2674 inhabitants.—Also, a town of Hillsborough county, in New Hampshire, containing 1117 inhabitants.—Also, a township of Wayne, in Pennsylvania, having 87 persons.—Also, a township of Somerset county, in the same state, with

with 1180 inhabitants.—Alfo, a township of Butler county, in Ohio, having 1037 inhabitants.

MILFORD, *New*, a town of Litchfield county, in Connecticut, having 3537 perfons.—Alfo, a township of Luzerne county, in Pennsylvania, having 178 inhabitants.

MILK, col. 5, l. 29 from bottom, for oxifying *r.* offifying.

MILK, *Chemical Properties of.* According to Berzelius, 1000 parts of milk deprived of its cream confist of

Water	- - -	928.75
Curd with a little cream	- - -	28.00
Sugar of milk	- - -	35.00
Muriate of potafh	- - -	1.70
Phofphate of potafh	- - -	.25
Lactic acid, acetate of potafh,	} 6.00	
with a trace of lactate of		
iron		
Earthy phofphates	- - -	.30
		<hr/> 1000

In the paragraph describing the fermentation of mares' milk by the Tartars, l. 2, after brandy, add—called *Koumif.*

After the paragraph upon cream, add—Cream of the fp. gr. 1.0244 was found by Berzelius to confist of

Butter	- - -	4.5
Cheefe	- - -	3.5
Whey	- - -	92.0
		<hr/> 100

After the obfervations on curd, add—*Curd* has many of the properties of coagulated albumen. It is white and folid, and when all the moifture is fqueezed out, it has a good deal of brittlenefs. It is precipitated by acids, and the precipitate confists of the curd combined with the acid employed. If this precipitate be digefted with carbonate of lime or barytes in water, the acid combines with the earth, remains undiffolved, (fuppofing the fulphuric acid employed,) and leaves the curd in folution. The aqueous folution of curd thus obtained is yellowifh, and refembles a folution of gum. When the folution is boiled in an open vefel, it becomes covered with a white pellicle, precifely as milk does, and acquires the fmell of boiled milk. The membrane is almofit infoluble in water, and appears to be produced by the action of the air on the diffolved curd. With the mineral acids, curd forms the fame compounds as albumen and fibrin do; but the neutral compounds are lefs foluble. A great excefs of acetic acid is required to diffolve curd, and the neutral compound of curd and this acid appear infoluble. According to the analysis of Gay Luffac and Thenard, curd is compofed of

Hydrogen	- - -	7.429
Carbon	- - -	59.781
Oxygen	- - -	11.409
Azote	- - -	21.381
		<hr/> 100

MILL CREEK, in *Geography*, a township of Hamilton county, in Ohio, having 1334 inhabitants.

MILLEDGVILLE, a town of Georgia, in the county of *Baldwin*; which fee.

MILLVILLE. Add—containing 1032 inhabitants

MILNTHORP, l. 2. *r.* Haverfham; l. 14, after population, add—of the townfhips of Milthorpe and Haverfham; l. 15, *r.* 1811—1138—242 houfes; l. 16, 546—592—129—111.

MILTON, l. 8 and 7 from bottom, *r.* 1811—307—1746.

MILTON, in America, l. 9, *r.* 1264; add—Alfo, a town of Stafford county, in New Hampfhire, having 1005 inhabitants.—Alfo, a town of Chittenden county, in Vermont, containing 1546 inhabitants.

MILVERTON, l. ult. *r.* 1811—1637; add—and number of houfes 322.

MINCHIN-HAMPTON, l. 27, *r.* 1811—town and parifh; l. 28, *r.* 3246, and occupying 710 houfes; l. 29, 1523 males, and 1723 females.

MINEHEAD, l. 3, *r.* 144.

MINEHEAD, l. 3, after England, add—By the returns in 1811, the borough and parifh were ftated to contain 255 houfes, and 1037 inhabitants; 443 being males, and 594 females.

MINERAL CAOUTCHOUC. See MINERALOGY, *Addenda.*

MINERALOGY, according to the moft eminent mineralogifts of the French fchool, comprises the ftudy of all inorganic fubftances that exift naturally in the earth, or on its furface. According to this comprehensive definition, water, air, and all ponderable elementary matter, may be claffed with minerals. The German mineralogifts ufe the term *mineral* in a more reftriated fenfe. See MINERALOGY, where is given a hiftory of the progrefs of this fciende, and an outline of the fyftems of Werner and Haiiy. For a more full account of the external characters of minerals, and of the fyftem of claffification introduced by Werner, fee ORYCTOGNOSY: and for the leading principles of crystallography, on which the fyftem of Haiiy is formed, fee CRYSTALLOGRAPHY, *Addenda.* Under the article SYSTEMS OF MINERALOGY, we have given a fummary view of the chemical fyftem of mineralogy recently attempted to be introduced by the diftinguifhed Swedifh philofopher Berzelius.

Mineralogy has fcarcely been cultivated as a regular fciende in Europe longer than fifty years, and in England it has not excited much attention until the prefent century; fince which time our acquaintance with the mineral kingdom has been rapidly extending. We propofe in the prefent article to defcribe thofe minerals which have been recently difcovered, or whose characters have been more accurately known fince the articles were written in which they were defcribed. Many minerals having received feveral different names, we have alfo deemed it expedient to give an alphabetical lit of all the known fpecies of minerals, with references to the particular name under which each is defcribed. This will, we truft, in a confiderable degree, remedy the inconvenience refulting from the ufelefs multiplication of names; an evil which, in this department of fciende, tends greatly to retard the progrefs of ufeul knowledge. To Werner, we are indebted for the firft precife definition of the external characters of minerals; but unfortunately both he and the mineralogifts of the Freyberg fchool have introduced fuch a multiplicity of divifions, fubdivifions, and minute diftinctions into the fciende, with fo many quaint terms to exprefs what was before perfectly definite in the language of common life, that the defcription of the moft intelligible properties is often rendered harfh and obfcure to the ftudent. This is greatly to be regretted, as it prevents many from cultivating mineralogy, deterred by a parade of frivolous diftinctions which affail them in limine.

The

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The characters of minerals, arranged according to the Wernerian method, are enumerated under the article **ORYCTOGOSY**; but a selection of the most important ones, with a further definition of some of them, appears necessary to render more complete this department of our work, and to enable the general reader to understand the descriptive language used by mineralogists. The characters of minerals are either *physical* or *chemical*. Physical characters are those properties which can be discovered without decomposing or changing the nature of minerals: under this term we comprise the external characters of Werner, and also some of those properties which are elicited by the action of other bodies on the mineral examined, such as magnetism and electricity.

Chemical characters in mineralogy are those properties which are most easily discovered by the action of heat, of acids, and of various re-agents. It is in this limited field that these characters are understood by the mineralogist. A complete analysis of minerals belongs to chemistry.

In our enumeration of physical characters, we shall commence with those which depend on the action of light; namely, colour, transparency, lustre, and refraction.

Colour is regarded by the German mineralogists as an important character, and it is that which first arrests the attention of the observer; but in earthy minerals, the colours of the same species are often so various, that this character loses much of its value as applied to them. The colours of minerals, as far as they have been chemically examined, are principally owing to metallic oxids and inflammable matter: the earths, the acids, and the alkalis, in a state of purity, are white or colourless. The colour of earthy minerals may, therefore, be regarded for the most part as arising from accidental admixtures with unimportant ingredients. But in the inflammable minerals and metallic ores, and in a few of the earthy minerals, the colouring matter is as important as the other parts, and generally more so; hence in the latter, the colour varies but little in each species, and is a character of importance precisely in proportion to its simplicity. For an enumeration of the different varieties of each colour, and the minerals in which they are most characteristic, and for change of colour, see **ORYCTOGOSY**.

Transparency, in its different degrees, from perfect transparency, semi-transparency, translucence, and opacity, are terms perfectly intelligible to every reader. When the cloudiness in semi-transparent minerals increases, so that the outline of objects can scarcely be seen, translucency commences, as in common chalcodony.

Double Refraction, or *Duplicating*, is the property which some transparent minerals possess of presenting a double image of an object when seen through them in particular directions, of which calcareous spar, an Iceland crystal, offers a remarkable example. See **CRYSTAL OF ICELAND**.

Opalescence, a term not unfrequently applied to some minerals, is thus defined by Mr. Jameſon: "Some minerals, when held in a particular direction, reflect from some single spots in their interior a coloured shining lustre; this is what is understood by opalescence: it is distinguished into *simple* and *stellular*; in the latter, the lustre diverges in six rays in the form of a star, as in the *star-sapphires*."

Lustre.—The lustre of a mineral produced by the reflection of light is of different kinds, and is called metallic, semi-metallic, adamantine, pearly, resinous, and vitreous. Perfectly opaque minerals, as the metals, and most of the metallic sulphurets, reflect the light wholly from the surface without undergoing any refraction, and exhibit the metallic lustre of various degrees of intensity; and the lustre is

increased, and the colour is unchanged, when a scratch is made in them with a knife or file. Minerals having a semi-metallic lustre yield a lighter colour, or have their lustre destroyed when scratched. The adamantine lustre is exhibited by minerals which are translucent, and possess great refractive power; the lustre is reflected from the interior of the mass with great vivacity, and is produced both by reflected and refracted light. Examples, the diamond, sulphur, and the native salts of lead. In these minerals, though the lustre is increased by polishing, yet its particular character is less distinct, owing to the increased reflection of unrefracted light from the surface.

The pearly or nary lustre is well exhibited in some kinds of zeolite, and in kyanite. When it proceeds from fibrous minerals, as in satin spar and fibrous gypsum, it is sometimes called a silky or satiny lustre.

The resinous lustre is well represented by that of pitch: it exists in pitch-stone and resinous flints.

The vitreous lustre is perfectly represented in rock-crystal.

Each of these kinds of lustre may vary in degree from the most splendid, which can be seen at a great distance, to shining, glitening, or glimmering. When entirely destitute of lustre, a mineral is called dull.

The *streak* implies the colour or lustre which a mineral exhibits when scratched with a knife or file: the colour is the same as that of the mineral when pulverized.

Soiling is a character that occurs in some soft minerals, which leave a mark when drawn on the surface of other bodies, or on the fingers, as plumbago, chalk, and redde.

The above are the principal characters depending on the action of light.

Phosphorescence.—Certain minerals give out light when rubbed against each other, as quartz; or when scratched with a knife, as dolomite. Other minerals give out light when thrown on hot coals, or heated iron, as fluor spar; and certain minerals emit light when exposed to the action of the blow-pipe.

Hardness and Solidity.—Solids are the only bodies to which the terms hard or soft can properly be applied. In common language, hardness and fragility are often confounded. A stone that endures many heavy blows before it breaks, is considered as harder than another which requires fewer blows for its fracture; but the property which different minerals have of resisting the point of a knife or file of hardened steel, or the effect produced when a mineral is rubbed on other minerals, or scratched by them, is the most unexceptionable test of their hardness. Thus some minerals scratch crystallized quartz, a stone easily recognized, and whose hardness in that state is always the same; other minerals scratch steel, glass, fluor spar, &c. This method is precise, and gives the real hardness of the parts; whereas striking fire with steel, which is often mentioned as a character, is a vague test, subject to variation from the form of the mineral, the sharpness of its edges, &c.; and soft minerals not unfrequently contain minute grains of harder ones, which will give sparks with steel.

As a knife is the most convenient and portable instrument for determining the hardness of most minerals, except gems, the following judicious observations on the use of it, by Mr. Aikin, are deserving the attention of the student. In fibrous minerals, a scratch directed across the fibres will always indicate a lower degree of hardness than the true one; for the fibrous structure presenting an alternation of ridges and furrows, the knife glances across the intervals, thus interrupting the uniformity of the stroke, and producing a succession of small blows, which rather break down than divide the

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summits of the ridges. The hardnæs should, therefore, be tried by a scratch parallel to the direction of the fibres, or, still better, on the surface of the transverse fracture. Another precaution is always to select a second undecomposed specimen to make a trial of the hardnæs, this character being affected sooner than any other by the spontaneous alteration of a mineral. In examining the relative degree of hardnæs of two minerals, by trying which will scratch the other, it is necessary to be aware that the solid angles and edges of the primitive forms are very sensibly harder than those of the derivative forms, or than the angles or edges produced by casual fracture, either of crystals or massive varieties of the same species. This fact has been long known to diamond-cutters, who always distinguish between the hard and soft points of the gem, that is, between the solid angles belonging to the primitive octahedron, and those belonging to any of its modifications, the latter being easily worn down by cutting or rubbing them with the former.

The whole range of hardnæs obtained by the use of the knife may be thus classed. When a mineral does not yield to the point of a knife, it may be called *very hard*, as quartz and flint. When it yields with great difficulty, it may be called *hard*, as feldspar. When a mineral yields more readily than the former, it may be called *semi-hard*, as hornblende and fluor spar. When it is easily scratched with a knife, it is called *soft*, as calcareous spar and barytes. And when it yields to the nail, *very soft*, as gypsum and chalk.

Tenacity.—By this property is understood the relative mobility of the particles of minerals, and the different degrees of coherence. In some metallic minerals, particularly native gold and silver, the particles, though they cohere with great force, are capable of a considerable degree of motion, and may be cut with a knife or extended with a hammer. Such minerals are called *malleable*. When a mineral may be cut into fragile shavings, or coarse grains, adhering to the knife, it is called *sectile*, as in plumbago and soap-stone. When on cutting a mineral with a knife, the particles dart off with a grating noise, it is said to be *brittle*. All hard minerals, and the greater number of semi-hard minerals, are brittle, as quartz and fluor spar.

Frangibility.—By this property is understood the resistance which minerals oppose to the stroke of a hammer before they are broken into fragments. The degrees of frangibility depend partly on the cohesion of the particles, and partly on the structure of the mineral. Frangibility must not be confounded with hardnæs; many soft minerals are more infrangible than hard ones. Quartz is much harder than hornblende, but may be broken with greater facility. The brittle minerals are the most frangible, whilst those which yield to the knife and are sectile are generally very tough; and the malleable minerals, such as native gold, can scarcely be said to be frangible.

A mineral is more easily frangible by a sharp blow from a small hammer, than by a heavier blow from a large hammer; hence this property appears to depend much on elasticity. Some earthy minerals, as beryl, flint, and topaz, are more frangible when first obtained from their native beds, than when they have been exposed for some time to the atmosphere, owing to their containing a portion of moisture which is afterwards evaporated. The degrees of frangibility, from very difficultly frangible to very easily frangible, are enumerated under *ORYCTOGOSY*.

Some earthy minerals, and all malleable minerals, bend without breaking, or are flexible; and some minerals are both flexible and elastic, as mica.

Structure of Minerals.—This is the internal arrangement of

the particles of a mineral. The three great divisions of structure are, the *perfectly crystalline*, *imperfectly crystalline*, and the *promiscuous structure*. The perfectly crystalline structure is described under the article *CRYSTAL*; and the Wernerian description of crystalline forms will be treated of in the following section. For the imperfectly crystalline and promiscuous structure, see *STRUCTURE of Minerals*, where these important characters are described. The structure of minerals is ascertained by the number of joints, or determinate directions in which a mineral can be split, or exhibits distinct laminæ. This is called the cleavage by the German mineralogists.

When a mineral splits in one direction, it is said to have a single cleavage, as in mica. The cleavage may be double, as in feldspar; triple, as in calcareous spar; quadruple, as in fluor spar; or six-fold, as in blende and rock-crystal.

The Wernerian system takes no measure of the angles under which the planes or laminæ of a mineral meet, except as being rectangular, equiangular, or oblique. But the angular measurement of the inclination of the planes forms the basis of Häuy's system of crystallography. (See *CRYSTAL* and *GONIOMETER*.) According to Werner, the two-fold cleavage is described either as rectangular, (examples, feldspar and hyacinth,) or oblique, as in hornblende.

In the triple cleavage, the laminæ may intersect each other rectangularly, as in lead-glance or galena; or the cleavage may be oblique, but equiangular, as in calcareous spar; or oblique and at unequal angles, as in heavy spar; or may be partly rectangular and partly oblique, as in selenite.

The four-fold cleavage may either be equiangular and oblique, as in fluor spar and the diamond, or three cleavages may be equiangular and oblique in the common axis of the crystal, and intersected by a fourth, which is at right angles with the axis, as in beryl.

In the six-fold cleavage, all the laminæ may meet under equal oblique angles, as in rock-crystal, or three of the cleavages may form equal and oblique angles in a common axis, and be obliquely intersected by three others, which also intersect the axis in an oblique direction.

Fracture.—This property is carefully distinguished from the structure by Häuy. The fracture is the casual division of the whole into fragments, and depends much on the kind of stroke by which it is produced, whereas the structure exists in the mineral before it is broken. Fracture is either *conchoidal*, which is composed of convex or concave elevations or depressions more or less regular. When regular they have smooth concentric ridges, as in many shells; hence the name is derived. The conchoidal fracture is distinguished according to the magnitude of the elevations and depressions, into large conchoidal, as in obsidian or flint, and small conchoidal, as in pitch-stone. It is further distinguished into deep or flat conchoidal, and into perfect conchoidal and imperfect conchoidal. The conchoidal fracture is characteristic of brittle minerals, which have some degree of lustre and transparency. The *uneven fracture* presents elevations which are commonly irregular and angular. This fracture is most frequent in metallic minerals, and in opaque minerals which have some lustre; it passes into small and imperfect conchoidal, and also into earthy.

The *even fracture* is that kind of surface which shews the fewest inequalities, and these inequalities are flat and never sharply defined. It passes into large conchoidal and splintery.

The *splintery fracture*, improperly so called, denotes a nearly flat surface, on which are numerous small wedge-shaped scales, adhering by their thick end.

The *earthy fracture* is peculiar to opaque earthy minerals,

as chalk. The surface has a number of minute elevations and depressions, which makes it appear rough.

The *hackly fracture* is peculiar to the malleable metals, and consists of short sharp-pointed protruding fibres, which are sometimes only discoverable by the feel.

These different kinds of fracture often pass into each other, and occur together: the most prevalent one must be taken as the characteristic fracture. In minerals which have a crystalline structure, the true or proper fracture is that which is across the direction of the planes. When crystalline minerals are broken, the division taking place more readily in the direction of the planes, the fragments have generally a tendency to a regular form, as cubic, rhomboidal, &c. according to the structure of the mineral from which they are broken.

Imperfectly crystalline minerals break into fragments, which are more or less regular, and contain the following varieties: the wedge-shaped, splintery, specular, and tabular.

Indeterminate fragments, from hard and brittle minerals, which possess no crystalline structure, have sharp edges and angles. In other minerals, the angles and edges are more or less blunt in proportion to their softness and toughness.

External form or shape of minerals is either *indefinite, definite, or crystalline*.

The *indefinite* or *amorphous*, called by Mr. Jameston the common external shape of a mineral. This character is applied when a mineral exhibits no appearance of regular planes or laminae, nor any resemblance to well-known natural or artificial bodies. When the mineral forms a thin coat or crust on other minerals, it is called *superficial* or *invealing*, which is common to friable or pulverulent minerals. Another variety is called *plated* or *membranaceous*, where the mineral forms thin membranes or flakes not exceeding in thickness common paper. When the three dimensions are not very different from each other, if the bulk is not considerable, the mineral is said to be in pieces, which may be either angular or rounded. If the bulk of an amorphous mineral be considerable, it is called *massive*. An enumeration of Werner's common external forms is given under *ORYCTOGENOSY*; which see.

The *definite* form, or particular external shape, appears in many instances to be derived from crystallization modified or disturbed by other causes. According to Mr. Aikin, many of the definite forms have evidently been occasioned by matter in a semi-fluid state having been exposed to the simultaneous action of crystallization, concentric attraction, and gravitation. To crystallization is owing the minute structure in short prisms or fibres laterally aggregated; to the concentric attraction it is owing that each of these fibres converges towards a real or imaginary centre, forming a curved thick plate of the whole, or several plates in successive coats, like the structure of the onion; and lastly, it is owing to gravitation that these concretions do not form perfect spheres, but are more or less elongated into the mammillary, the reniform, the botryoidal, and the stalactitic varieties. Of particular external forms, a great variety are enumerated. (See *ORYCTOGENOSY*.) The definite form that approaches nearest to the regular crystalline, is the *arborescent* or *dendritic*: it bears a near resemblance to a vegetable spray; hence its name. On minute examination, it will, however, be found to consist of crystals occasionally very perfect, implanted one into another, and branching in different directions. Certain varieties have obtained particular names, as *reticulated* or *reniform*, when the branches intersect like the meshes of a net; and *petiolated*, when a number of short branches rise parallel to each other, at nearly equal distances, on the same side or on opposite sides of a main branch, as in a comb.

The *crystalline* form of minerals is called by Mr. Jameston the regular external shape. When a mineral occurs crystallized in a simple form which has received a name in geometry, as the cube, the rhomboid, the octahedron, &c. it is easy to give an idea of it by referring it to that form; but when a crystal presents a great number of unequal planes, or is very complicated, the description becomes difficult without a drawing or model. Mr. Werner has, however, considerably facilitated the mode of describing crystals by considering them as modifications of certain simple forms; and this mode, though not strictly scientific, is found most convenient in practice.

The simple forms, or what he calls the fundamental forms, are, the *cube* (*fig. 1.*); the *rhomboid* (*fig. 2.*); the *prism*, which may have three, four, or a greater number of sides (*figs. 3, 4, 5, &c.*); the *pyramid*, which may have three, four, six, or eight triangular planes (*fig. 6.*); the *table*, which has two equal and parallel planes, which are very large compared with the thickness of the table, and is bounded by an indeterminate number of sides (*figs. 7 and 8.*) The three following forms are very rare. The *icosaedron*, having twenty equilateral planes (*fig. 9.*); the *dodecahedron*, having twelve pentagonal faces (*fig. 10.*); and the *lens*, which has two curved faces (*fig. 11.*)

Mr. Aikin is of opinion, that the number of simple forms, or models, to which almost all crystals can be referred, may be reduced to four. The prism, the rhomboidal dodecahedron (*fig. 12.*), the regular tetrahedron (*fig. 13.*), and the double pyramid formed by two equal and similar pyramids joined together by a common base. The pyramid, like the prism, may have a greater or smaller number of sides, and the edges of the base of each pyramid may be in the same plane, as in *fig. 14.*, or set on obliquely, as in *fig. 31.*

These forms, or models, it must be carefully noticed, have no connection with the true primitive forms of crystals (see *CRYSTALLOGRAPHY, Addenda*), but are merely adopted as convenient types for the description of crystals. The changes which these forms are supposed to undergo by truncation and bevelment may take place either on the edges or solid angles of the crystal. As the prism and the cube are the most common forms of crystals, we shall proceed to describe them modified by these changes. The prism, as we have before observed, may have several sides, and may be triangular, or rectangular, as in *fig. 3*; oblique, as in *fig. 4*; or polygonal and equiangular, as in *fig. 5*. The sides are technically called the lateral planes, they are parallel to and surrounding an imaginary axis. The bases at each extremity of the prism are called the terminal planes. The lateral edges are formed by the junction of two contiguous sides or planes, and the terminal edges are formed by the junction of the lateral planes with the base or terminal planes, and the solid angles are formed at the point of junction of the terminal planes with the lateral planes. The cube may also be described as a short rectangular four-sided prism. When a solid angle is removed and one plane is formed in its place, as in *Plate VII. fig. 16*, the crystal is said to be truncated on the angles. When planes are formed on the edges of a crystal, as in *fig. 17*, it is described as truncated on the edges: and when two planes are formed on an edge of the crystal, as in *fig. 18*, it is said to be bevelled on the edges. *Fig. 19* is a three-sided prism bevelled on its lateral edges. When the solid angles of a crystal, or the terminal planes, appear cut off by three or more planes converging to a point, the crystal is said to be acuminated: in *fig. 20*, each angle of the cube is acuminated by three small planes set on the lateral planes; and in *fig. 21*, each angle is acuminated by planes set on the lateral edges. *Fig. 22*, according

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to the Wernerian method, is a four-sided prism, acuminate at each extremity by four planes set on the lateral planes. *Fig. 23.* is a four-sided prism acuminate by four planes set on the lateral edges. In the second instance, the acuminating planes are rhomboidal; in the first instance, triangular. *Fig. 24.* is the equiangular six-sided prism, acuminate at each extremity by six planes set on the lateral planes. *Fig. 25.* is a similar prism acuminate by three planes at each extremity set on the alternate lateral planes: and *fig. 26.* is also a similar six-sided prism acuminate by three planes at each extremity, set on the alternate lateral edges. The planes at the opposite extremities in *figs. 25* and *26.* are set in different planes or edges, and are what the Germans call *uneconformable*.

The octahedron, or double four-sided pyramid (*fig. 27.*), is a common form of crystals: it is frequently truncated or bevelled. *Fig. 28.* represents the octahedron bevelled at each of the angles. *Fig. 29.* is a double eight-sided pyramid acuminate by four planes at each extremity, set on the alternate lateral edges of the pyramid, thus forming a crystal with twenty-four faces, a form common in the leucite. The table may be bevelled on the surrounding edges, as in *fig. 30*; but in this figure, the Wernerian mineralogists call the surrounding sides the terminal planes, and the larger sides the lateral planes, a deviation for which there does not appear any sufficient reason, and which is liable to introduce confusion into the description of crystals. Some of the forms here referred to, particularly *figs. 22* and *24.* may be more simply described as four-sided and six-sided prisms, terminated at each extremity by four-sided or six-sided pyramids. The edges of a crystal may sometimes be doubly bevelled, or may be bevelled, and the edge of the bevelment truncated. Such modifications are better described as replacements of the edges by three, four, or more small planes or secondary faces. A very long prism is called a capillary crystal, if the diameter be too small to render the faces distinct. A very short prism, in which the length is very small in proportion to the thickness, may be regarded as a tabular crystal. Most crystals may be very intelligibly described by assuming the fundamental forms of Werner variously modified. We are not, however, to suppose, that Werner himself intended to convey the idea that nature first made crystals complete, and then cut away the angles and edges; he only expresses, by the terms truncation and bevelment, the appearance the crystal presents to the eye. The primitive forms, or the true fundamental forms of crystals, as given by Haüy, are enumerated under the article CRYSTAL; but *Plate VII. Crystallization*, comprises those forms, and also those of the integrant molecule. The primitive forms are, the parallelepiped, including the cube and rhomb (*figs. 1* and *2.*), and the rectangular-table (*figs. 7* and *8.*), the octahedron (*fig. 27.*), the tetrahedron (*fig. 13.*), the hexagonal prism (*fig. 5.*), the rhomboidal dodecahedron (*fig. 12.*), and the dodecahedron with triangular faces (*fig. 14.*) The integrant molecules are, the tetrahedron (*fig. 13.*), the three-sided prism, and the cube (*fig. 1.*)

In nature, we rarely find crystals entirely perfect and symmetrical. If, says Mr. Aikin, the student should imagine that the real crystals of minerals, such as nature presents them, are formed with the precision that characterises the models of the crystallographer, he will in general find himself much mistaken. By far the greater number of crystals are either imbedded in other substances, from which it is difficult to disengage them without much injury, or inhere by one extremity in amorphous or uncrystallized matter of the same nature with themselves. Hence it is, that few prisms occur both terminations of which are entire. Not

unfrequently also crystals, by being formed in narrow clefts, are compressed, or in other ways variously mutilated, and thus perplex even the most skilful mineralogist. Their minuteness too, when the parts are much complicated, is frequently such as to elude the keenest eye and the most adroit use of the goniometer.

It is often by no means easy to distinguish genuine from *spurious crystals*. The latter are generally supposed to have been formed in cavities occasioned by the decomposition of real crystals. These are called casts. Spurious or supposititious crystals are either calls or incrustations; the latter occurs when a mineral is deposited over a pre-existing crystal and assumes its figure. The crystal either remains forming a nucleus, or it disappears, and the supposititious crystal is hollow.

In the Wernerian oryctognosy, the magnitude of crystals and their mode of aggregation are minutely enumerated. (See ORYCTOGNOSY.) In the last edition of Mr. Jameson's external characters, he defines the *scopiform* or *fascicular* aggregation as "composed of a number of thin prismatic crystals, diverging from their point of attachment, and forming a kind of fasciculus or bundle; example, zeolite." The manipular, or sheaf-like, consists of a number of crystals that diverge towards both ends and are narrower in the middle, thus resembling a sheaf; examples, zeolite and prehnite.

Scalarisæ is when many cubical crystals are arranged like the steps of a stair; example, cubes of corneous silver-ore.

The surface of crystals is either smooth or streaked, the streaks sometimes cross longitudinally and sometimes transversely. These streaks are deserving of notice, as they frequently serve to indicate the structure of crystals. See CRYSTALLOGRAPHY, *Addenda*.

Electricity is a character peculiar to a small number of crystallized minerals, that exhibit the positive and negative electricity at their extremities on being heated. This property was first discovered in the tourmaline. (See TOURMALINE.) The points which exhibit electricity are called the electric poles. In order to distinguish these poles from each other, the following simple apparatus is employed. (See CRYSTALLOGRAPHY, *Plate IV. fig. 92. A.*) It consists of a needle of copper or silver, having at each end two small balls *a, b*; this needle, like the common compass-needle, is moveable upon a pivot, having a very fine point, and at the bottom a stand or foot. The needle and stem are insulated by placing the foot on a plate of wax or resin. To use the apparatus, we place one finger on the stem, and present near to the needle a stick of sealing-wax, made electrical by rubbing, then withdraw the finger, and afterwards the stick of sealing-wax, and the needle will be positively electrified; and when a crystal electrified by heat, and held by a pair of small pincers in an insulated handle, as at *B*, is brought so that the positive or negative pole may approach one of the balls *a, b*, it will be attracted or repelled. The electricity of the needle will be perceived a quarter of an hour, or longer, and may be rendered more or less strong by varying the distance at which the stick of sealing-wax is held. It may be proper to observe that many minerals become electric by friction.

Magnetism is a character which occurs principally in ores of iron, or in minerals that contain a portion of iron, or iron in a state of black oxyd.

The above are the most important physical characters, comprising those which are called the external characters by Werner, and those to which he restricts the term physical.

Specific Gravity, or weight, is one of the most important

portant characters of minerals, and is obtained accurately by weighing them in the hydrostatic balance. (See **HYDROSTATICS.**) For most practical purposes, a pair of common gold scales that will turn freely with the tenth part of a grain is sufficiently accurate. The mineral may first be weighed, and the weight be noted, and then it must be suspended by a fine thread, and weighed again in rain or river water, about the temperature of 60°. The original weight of the mineral divided by the difference of the weight will give its specific gravity, or the weight compared with that of water. The heaviest bodies are the metallic, and the metallic ores, which range from about five times the weight of water to seventeen; the latter is the specific gravity of native platinum. The heaviest earthy minerals are the barytic and ironitic earths, and the gems; these range from 3.5 to 4.5. The other solid earthy minerals range from 2. to 3.5, and some few solid minerals are lighter than water, as rock-cork.

The *feel*, whether unctuous, or smooth or dry, meagre or harsh, is a character which serves to distinguish particular minerals. The odour and taste are also characters of particular minerals; some yielding a peculiar odour naturally, as petroleum, or when rubbed, as swine-stone; and others, as the saline, affect the taste. Adhesion to the tongue is also a character possessed by minerals which absorb water. The coldness and sound of minerals are also given as characters by Werner, but they are of little practical value.

Friable minerals are either loose, as when the particles have no perceptible coherence, or are slightly cohering. The particles are in some instances scarcely discernible, and are called dusty particles, as in cobalt cleft; in other instances, the particles are large and scaly.

The fluid minerals are few in number, and are characterized by their fluidity, transparency, and lustre.

The remaining characters are purely chemical, except the action of water, and of the atmosphere, which is in some instances chemical, and in others mechanical. Water unites with many of the clays, and renders them plastic; other minerals, as fillers' earth, fall to pieces in water, without being dissolved, or even rendered plastic. In some cases, minerals absorb water, which alters their transparency and colour. Saline minerals chemically combine with water, and are dissolved. To the absorption of water, is owing the property of adhering, when applied to the tongue before noticed. The action of the atmosphere on minerals is principally effected either by the abstraction or absorption of moisture, and the oxydation of minerals when exposed to the air is for the most part owing to the moisture which it contains.

The chemical characters of minerals are those which the mineralogist can ascertain by the action of acids, or of heat as applied by the blow-pipe, either simply or aided by re-agents. The action of acids is of great use in ascertaining many essential characters of minerals. For this purpose, the muriatic or the nitric acids of moderate strength are most convenient. A minute fragment of the mineral may be placed in a watch-glass, and a few drops of acid poured upon it. The native carbonates effervesce, and are dissolved. Some minerals require to be reduced to a state of powder to shew the action of acids, and are hereby reduced to the form of jelly in a few hours, as zeolite. Other minerals only require to be touched with a glass rod dipped in acid to ascertain their nature.

The blow-pipe is an instrument of very great use to the mineralogist; it has been already described. (See **BLOW-PIPE.**) A blow-pipe which can be carried in the pocket, to be worked when required by the mouth, is by far the

most convenient; but it requires some precautions in the management to render it efficient. The best and clearest directions for this purpose which we have seen are those given by Mr. Aikin.

"Few persons," he says, "are able at first to produce a continued stream of air through the blow-pipe, and the attempt often occasions a good deal of fatigue. I shall make no apology, therefore, for treating this matter somewhat in detail. The first thing to be done is to acquire the habit of breathing easily and without fatigue through the nostrils alone; then to do the same while the mouth is filled and the cheeks inflated with air, the tongue being at the same time slightly raised to the roof of the mouth, in order to obstruct the communication between the mouth and the throat. When this has been acquired, the blow-pipe may be put into the mouth, and the confined air expelled through the pipe by means of the muscles of the cheeks. As soon as the air is nearly exhausted, the expiration from the lungs, instead of being made through the nostrils, is to be forced into the cavity of the mouth; the communication is then instantly to be shut again by the tongue, and the remainder of the expiration is to be expelled through the nostrils. The second, and all subsequent supplies of air to the blow-pipe, are to be introduced in the same manner as the first. Thus, with a little practice, the power may be obtained of keeping up a continued blast for a quarter of an hour, or longer, without inconvenience.

"Much depends on the size of the external aperture of the blow-pipe. If so large that the mouth requires very frequent replenishing, the flame will be wavering, and the operator will soon be out of breath; if, on the other hand, the aperture be too small, the muscles of the cheeks must be strongly contracted, in order to produce a sufficient current, and pain and great fatigue of the part will soon be the consequence. An aperture about the size of the smallest pin-hole will generally be found the most convenient, though for particular purposes one somewhat larger or a little smaller may be required.

"Several varieties of form have been recommended for the blow-pipe: they all have their advantages and disadvantages. Upon the whole, it appears desirable that there should be an expansion of the tube somewhere between the two extremities, both for the sake of collecting and retaining the condensed moisture of the breath, and for producing a regulated pressure, and therefore a regular blast. The nozzle also should be tipped with a moveable piece for the convenience of giving at least three different sizes of aperture. These conditions being obtained, other circumstances are of small importance, provided neither the bulk nor weight of the instrument be troublesome.

"The fuel for this little reverberatory furnace (as the blow-pipe apparatus may, without impropriety, be denominated) is oil, tallow, or wax, kept in combustion by means of a wick. The oil is the worst, the tallow is better, and the wax is best, not only as being cleaner, and free from any offensive smell, but also as affording a greater heat. The management of the wick too is a matter of some nicety. It should neither be too high nor sufficed too low, and should be a little bent at its summit from the blast of the pipe. All casual currents and drafts of wind ought to be carefully avoided, as rendering the flame unsteady, and very materially impairing its strength. The above conditions being duly complied with, the flame, while acted on by the pipe, will evidently consist of two parts, an outer and inner; the latter will be of a light-blue colour, converging to a point at the distance of about an inch from the nozzle; the former will be of a yellowish-white colour, and will converge

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less perfectly. The most intense heat is just at the point of the blue flame. The white flame consists of matter in a state of full combustion, and calcines or oxygenates substances immersed in it; the blue flame consists of matter in a state of imperfect combustion, and therefore partly deoxygenates metallic oxys which are placed in contact with it.

“The supports of the various substances while undergoing the action of the blow-pipe come next to be considered. Of supports there are two kinds, combustible and incom-bustible. The combustible support (used chiefly for metallic ores) is charcoal. The closest-grained and foundest pieces are to be selected for this purpose; and even the best often split and become rifty after being used for a short time. This will not unfrequently happen in the middle of an experiment, when the melted globule sinks into the cracks, is lost, and the experiment must be begun again. Instead of sticks of charcoal, some persons recommend that the charcoal, after being finely pulverised, should be moistened with a solution of gum tragacanth, and moulded into a convenient form; a plan that well deserves to be fairly tried. Perhaps simply moistening the charcoal-powder, and then submitting it to the action of a very strong screw-press, might be still better. The incom-bustible supports are, metal, glass, and earth, in the use of all which one general caution may be given,—to make them as little bulky as possible. The support always abstracts more or less of the heat, and in many cases, especially when metallic spoons are employed, entirely prevents the flame from producing its due effect. The best metallic support is platina, because it is infusible, and transmits heat to a less distance and more slowly than other metals. A pair of slender forceps of brass, pointed with platina, is the best possible support for non-metallic minerals that are not very fusible. For the fusible earthy minerals, and for the infusible ones when fluxes are used, leaf-platina will be found the most convenient; it may be folded like paper into any desirable form, and the result of the experiment may be obtained simply by unfolding the leaf in which it was wrapped up. Glass supports are slender tubes or rods of this substance. If the mineral to be examined is of a longish or fibrous shape, one end may be cemented to the top of the glass rod by heating it, and in this state it may be further examined with great convenience. Earthen supports are used only for extemporaneous cupellation; they are best made of bone ash, and must of necessity be of a certain bulk, in order to absorb the litharge, and other impurities, which it is the object of this process to separate from the *fine metal*. With regard to the magnitude of the specimens required for examination, no very precise rule can be given; the most fusible, such as some of the metallic ores, may be as large as a small pea, while the more refractory of the earthy minerals should scarcely exceed the bulk of a pin's head.

“The heat that is first applied to investigate the properties of mineral substances should be very slow, not exceeding that which exists on the outside, even of the yellow flame; at this temperature, the phosphorescence is best elicited, and decrepitation for the most part takes place, the fusible inflammables begin to melt, and the metallic and most other mineral salts lose their water of crystallization. The yellow flame will raise a substance to a tolerably full red heat, by which the following effects are produced. Many changes of colour take place, all the yellow ores of iron become red, and the peach-blossom tinge of flowers of cobalt becomes blue; certain earthy minerals lose their water of crystallization or of composition, and exfoliate, as gypsum, or throw up coarse and irregular ramifications, as

prehnite and mesotype. At this temperature, also, carbonate of ironian begins to tinge the flame with its peculiar crimson colour, and muriate of copper with its bright green colour. The roasting of all the metallic ores is best carried on at this heat; sulphur and arsenic are drawn off, and exhibit their characteristic odours; grey antimony melts; native bismuth runs out from the matrix, through which it is disseminated; and pear spar and spathose iron blacken and become magnetic. In the still higher degree of heat produced at the point of the interior blue flame, although some minerals still continue perfectly refractory, and undergo but little change of any kind, yet the greater part is very sensibly altered. Some, as pearl-stone, enlarge very considerably in bulk at the first impression of the heat, but are with difficulty afterwards brought to a state of fusion. Others become covered with a superficial glazing, and the sharp edges and angles become glossy and rounded off. Others, consisting really, though not visibly, of an intermixture of two substances differing in fusibility, undergo the process of *fritting*, in which refractory grains are dispersed through a vitreous mass. In others, a complete fusion takes place, and produces a spongy opaque semivitreous mass called a slag, or an opaque glass called an enamel, or a more or less transparent or true glass, which latter may vary in texture from compact to porous and spongy or intumescent.

“In examining the habitudes of the earthy minerals with the blow-pipe, no fluxes are required; whereas to most of the metallic ores, fluxes will be found at almost all times a very useful and often a necessary addition. The ores of the difficultly reducible metals, such as manganese, cobalt, chrome, and titanium, are characterized by the colour which their oxys give to glass; in all these cases, therefore, vitreous fluxes must be largely made use of, both to dissolve the earthy matter with which the oxys are generally mixed very intimately, and to furnish a body with little or no colour of its own, which may receive and sufficiently dilute the inherent colour of the oxyd. I say *sufficiently* dilute, because the colour of most oxys is excessively intense, and most persons in their first experiments of this kind, are very apt to obtain ambiguous results in consequence of using too large a proportion of oxyd, that the glass, whether blue, red, or green, appears quite black. With regard to fluxes, the following will, I believe, be found amply sufficient. Where the object is not only to dissolve the oxyd, but at the same time to retain it at a high state of oxydation, the flux employed should be either nitre or a mixture of this with a glass of borax, or, still better, nitrous borax formed by dissolving common borax in hot water, neutralizing its excess of alkali by nitric acid, then evaporating the whole to dryness, and lastly hastily melting it in a platina crucible. For an active, and at the same time non-alkaline flux, boracic acid may be used, or neutral borate of soda; and where a slight excess of alkali is required, or at least does no harm, common borax by itself, or mixed with a little cream of tartar, when a strong reducing flux is wanted, may be had recourse to. For coloured glasses, the proper support is leaf-platina; but for reductions, charcoal. In the latter case, the ore previously roasted, if it contain either sulphur or arsenic, is to be pulverised and accurately mixed with the flux; a drop of water being then added to make it cohere, it is to be formed into a ball, and deposited in a shallow hole in the charcoal, being also covered by a piece of charcoal, if a high degree of heat is wanted. The easily reducible metals, however, may be treated with less ceremony; a bit of the ore being placed on the charcoal, and covered with glass of borax, will, in the space of a few seconds, be melted by the blow-pipe, and converted

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converted into a metallic globule, imbedded in a vitreous scoria.

“In all cases where a metallic globule is obtained, it should be separated from the adhering scoria, and examined as to its malleability and other external characters; being then placed a second time on the charcoal, but without flux, it is to be brought to a state of gentle ebullition, during which the surface being oxygenated, will exhale a heavy vapour that condenses on the blow-pipe, or falls down on the charcoal in form of a powder, or of spicular crystals, from the colour and other characters of which the nature of the metal may probably be ascertained. If any suspicion is entertained of a portion of silver or of gold being mixed with the oxydable metal, the button must be placed on an earthen support, and there brought to a full melting heat; by degrees the oxydable metal will become scorified, and will entirely sink into the support, leaving on the surface a bright bead of *fine metal*, if such was contained in the alloy; but the proportion of this last being generally very small, and the entire mass of the alloy often not exceeding a large shot, it is not unfrequently necessary to have recourse to the magnifying glass, to be fully convinced of the presence or absence of fine metal.” Aikin’s Manual of Mineralogy.

The above directions will be found of the greatest use, and are sufficiently ample to make any additional remarks unnecessary. Some German mineralogists have, indeed, arranged under nearly one hundred heads, the different changes produced on minerals by the action of the blow-pipe, and have given elaborate explanations of words known with sufficient accuracy by almost every child of seven years of age. This we regard not as smoothing the paths of science, but as blocking them up with rubbish to impede the progress of the student.

In the mineralogy of Häüy, he has introduced very judiciously what he denominates the *distinctive characters* of minerals, noting the particular characters which serve to distinguish one mineral species from another, to which it has the greatest general resemblance.

New species of minerals have been discovered almost every year since the commencement of the present century, the greatest number of these discoveries have been made in the mines of Sweden. Few, however, of the newly discovered minerals possess properties that entitle them to much notice, and it is highly probable, that as the science of mineralogy advances to perfection, many of these supposed new species will be discovered to be only varieties of species that have been long known.

ACTINOLITE, or *Aëtnolite*. Fr. *actinote*. See STRAHLSTEIN.

ACTINOTE, *Amphibole*. See STRAHLSTEIN.

ADAMANTINE Spar, or *Common Corundum*; *Corindon harmophane*, Häüy. See ADAMANTINE Spar.

ADHESIVE Slate, a species of polishing slate, or *polier schiste*. See POLISHING Slate, *Addenda*.

ADULARIA. (See FELSAPAR, *Addenda*.) This variety of feldspar was formerly confounded with glassy feldspar. (See GLASSY Felspar, *Addenda*.) Adularia occurs in veins of granite in Bamshire, in the Isle of Arran, and other parts of Scotland. Rolled pieces of adularia having a most beautiful pearly light are found in the island of Ceylon.

AGALMATOLITE, or *Figure-Stone*; *Beldstein*, Werner; *Talc graphique*, Häüy. A mineral which may be regarded as an indurated steatite, or rather, according to Jamelon, as intermediate between steatite and nephrite or jade. It occurs massive; the fracture is splintery, or imperfectly flaty; the colours are greenish-grey, apple-green, or yellowish-brown, and sometimes flesh-red and rose-red. It is

translucent, unctuous to the touch, and yields with ease to the knife, owing to which property it is carved with facility into different figures by the Chinese, and into pagodas, cups, and snuff-boxes. The specific gravity is from 2.6 to 2.8. According to Klaproth, the constituent parts of agalmatolite are,

	from China.	from Nagyag.
Silex - - -	54 - -	55
Alumine - -	34 - -	33
Lime - - -	- - -	- -
Potash - - -	6.25 - -	7
Iron - - -	0.75 - -	0.50
Water - - -	4 - -	3
	99	98.50

According to Aikin, this mineral occurs at Glyder Bach, Caernarvonshire.

AGARIC Mineral, or *Rock Milk*; *Chaux carbonatée spongieux*, Häüy. See AGARIC Mineral.

AGATE. (See AGATE.) The agate is not a simple mineral, but is composed of various siliceous substances arranged in concentric lamellæ, exhibiting, when cut and polished, zones and angular lines, like fortifications. There is also a kind of agate-breccia, in which angular fragments are cemented by quartz or chalcedony. Agates appear to be formed by siliceous infiltration in the cavities of basaltic rocks, the formation commencing from the surface, and the cavity gradually filling by successive depositions on the sides, until the whole forms one solid nodule. According to the direction of the lines or the structure of agates, they are denominated *ribbon or striped agate*, *fortification agate*, *landscape agate*, *brecciated agate*, *sabular agate*, *jasper agate*, *spotted agate*, *blended agate*, *star agate*, marked with radiated spots; *petrification agate*, fossil-shells and zoophytes are sometimes penetrated or filled with agate. In the variety called *moss agate*, nodules of chalcedony inclose minute arborizations resembling moss, some of which are supposed by mineralogists to be branches of moss suddenly inclosed and preserved in siliceous matter.

ALABASTER, *Calcareous*, or *Calcifer Alabaster*, *Gypsifer Alabaster*. See ALABASTER and GYPSUM.

ALALITE, *Diopside*, and *Musfite*, a mineral allied to augit; first found in the Alp of La Mufla, near the town of Ala, from whence the names alalite and musfite are derived. See DIOPSIDE, *Addenda*.

ALLANITE, *Cerium allanite*, Fr. an ore of the newly-discovered metal cerium, first analysed by Mr. Allan, and hence called allanite. Its colour is a brownish-black; it occurs disseminated and crystallized in rhomboidal prisms, the angles of which measure 117° and 63°. The internal lustre is shining, and resin-metallic. It is opaque, and yields a greenish-grey streak. It scratches glass, is brittle and easily fragrant. Before the blow-pipe it froths, and melts into a brown slag. It gelatinizes in nitric acid. The specific gravity is from 3.5 to 4. The constituent parts are,

Oxyd of cerium - - -		33.9
Oxyd of iron - - -		25.4
Silex - - -		35.4
Lime - - -		9.2
Alumine - - -		4.1
Moisture - - -		4

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It occurs in granite in West Greenland.

ALLOCHROITE,

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ALLOCHROITE, *idem*, Häüy; *splintery garnet* of Karsten. It is classed with the garnet family by Werner, but is regarded as a distinct species. It occurs massive; the fracture is uneven, passing into conchoidal. Its colours are greenish and yellowish-grey: it is translucent on the edges; internally it has a glistering resinous lustre. It gives sparks with steel. The specific gravity is 3.5. It has hitherto been found only in an iron-mine at Dramman, in Norway. It is less hard and lighter than common garnet. According to Vauquelin, the constituent parts are,

Silice	-	-	35
Alumine	-	-	8
Lime	-	-	30.5
Oxyd of iron	-	-	17
Carbonate of lime	-	-	6
Oxyd of manganese	-	-	3.5
			100

ALMANDINE, regarded as a variety of garnet. See **ALMANDIN**; but for granite *r.* garnet.

ALUM-EARTH, *Alum-Slate*, *Common and Glossy*, *Alum-Stone*. See **ALUM**, *Ores of*.

ALUMINITE, *Subsulphate of Alumine*; *Reine thonerde*, Werner; *Alumine pure*, Häüy. This mineral is of a snow-white colour, verging on yellowish-white. It occurs in reniform pieces, it has no lustre, the fracture is earthy, and the confluence between friable and solid. It is opaque, soils slightly, affords a glistering streak, and adheres feebly to the tongue. It feels fine, but meagre. The specific gravity is 1.66. A variety of the same mineral substance occurs at Newhaven in Suffex, filling up fissures in chalk. This variety is white, yields to the nail, and adheres strongly to the tongue. The constituent parts of the foreign aluminite are,

Alumine	-	-	32
Water	-	-	47
Sulphuric acid	-	-	19.25
With a trace of silice, lime, and iron, equal in some specimens to	}	}	1.25
			99.5

AMALGAM, *Native*, semifluid and solid. See **MERCURY**, *Ores of*.

AMANTHOIDE, *Capillary*, and *Amanthoide*, *Byssolite*; the latter is called by Saussure. The former appears to be a variety of amianthus; the latter resembles it, but differs from it in chemical composition, if the analysis of Saussure be correct. It is supposed to be hornblende in a capillary form. Häüy.

AMAZON-STONE, green feldspar from South America, which is cut and polished, and sold under that name, because it is found in rolled pieces on the banks of the river of the Amazons.

AMBER, *White and Yellow*. The white amber is of a straw-yellow or yellowish-white colour. It occurs massive, and sometimes inclosed in the yellow amber; it is less transparent than yellow amber. See **AMBER**.

AMETHYST, a variety of crystallized quartz. (See **QUARTZ**, and **AMETHYST**.) Werner divides amethysts into two sub-species, common and fibrous. The prevailing colour of the amethyst is violet-blue of different degrees of intensity; but it is sometimes plum-blue and brownish-black; also grey, olive-green, and pistachio-green, which

last colour is very rare. In massive varieties of amethyst, several colours occur together. In crystallization and other properties, the amethyst does not differ from quartz. It contains 97.50 of silice, with a minute trace of alumine, oxyd of iron, and manganese; to these oxyds, no doubt, its colours are owing. Amethysts occur in agate balls in basaltic rocks. Thick fibrous amethyst occurs massive and in rolled pieces; it occurs in agate veins, in the same rocks as common amethyst. A red colour is given to amethysts by the jewellers, by inclosing them in charcoal, which is ignited, and allowed to consume gradually. When the colour is not uniformly diffused, it is exposed in a mixture of sand and iron to a moderate heat, by which it is rendered more uniform.

AMIANTHUS, *Flexible asbestos*; *Amiant*, Werner; *Asbeste amiantée*, Fr. (See **AMIANTHUS**, and **ASBESTUS**.) It is found in serpentine in the Ile of Anglesea, and in the same rock at Portofy in Scotland.

AMPELITE is a bituminous slate, or shale, of which drawing-slate, alum-slate, and slate-clay, are varieties. See **SLATE**.

AMPHIBOLE, hornblende. See **HORNLENDE**, *Adenda*.

AMPHIBOLE Lamellaire, common hornblende.

AMPHIBOLE Crystallisée, basaltic hornblende.

AMPHIBOLE Actinote. See **STRAHLSTEIN**.

AMPHIBOLE Fibreux, glassy actinolite. See **STRAHLSTEIN**.

AMPHIBOLE Aciculaire, asbestos actinolite. See **STRAHLSTEIN**.

AMPHIBOLE Blanc et Scyeux, asbestos tremolite, grammite. See **TREMOLITE**.

AMPHIBOLE Grammatite, common tremolite and glassy tremolite.

AMPHIGENE. See **LEUCITE**.

ANALCIME. See **ZEOLITE**.

ANATASE, or *Orthodreite*, *Titane anatare*, Häüy. See **TITANIUM**.

ANDALUSITE, *Feldspath aphyre*, Häüy, is of a flesh-red colour, sometimes inclining to pearl grey; it occurs massive or crystallized in rectangular four-sided prisms, with the terminal edges and angles sometimes truncated. The structure is imperfectly lamellar, with a double rectangular cleavage, parallel with the lateral planes of the prism. It is translucent; it scratches quartz with ease, but is rather easily frangible. The specific gravity is 3.16. Before the blow-pipe it becomes white, but is infusible. According to Vauquelin, the constituent parts are,

Silice	-	-	32
Alumine	-	-	52
Potash	-	-	8
Oxyd of iron	-	-	2
			94

It occurs in veins in granite, gneiss, and mica-slate, along with feldspar, quartz, mica, and schorl. It was first found in the province of Andalusia. It has since been found in Aberdeenshire. The crystals are generally middle-sized or small, and occur imbedded. It is distinguished from feldspar by its greater hardness, weight, and infusibility; and from corundum by its double rectangular cleavage, and its inferior specific gravity.

ANHYDRITE, or *Anhydrous Gypsum*, a species of gypsum which contains scarcely a trace of water in its composition, and is much harder than common gypsum; the latter

(See

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(see GYPSUM) contains 22 per cent. of water, and some varieties 38 per cent. There are five varieties of anhydrite: *compact, fibrous, radiated, sparry, and scaly.*

Compact Anhydrite.—Its colours are various shades of white, inclining to small blue, blueish-grey, and is also red and brownish-red. It occurs massive, contorted, and reniform. The contorted variety, from its resemblances to the convolutions of the intestines, was called *tripe-stone, or pierre de tripe.* Compact anhydrite is more or less translucent, is feebly glimmering, has a small splintery fracture, passing into even or conchoidal. The fragments are sharp-edged: it is difficultly frangible. Specific gravity from 2.8 to 2.9. According to Klaproth, the constituent parts are,

Lime	-	-	41.48
Sulphuric acid	-	-	56.28
Water	-	-	.75
			98.51

Fibrous Anhydrite is of a red colour: it occurs massive, and has a delicately fine and parallel fibrous structure. *Radiated anhydrite* has a blue or greyish colour, and is sometimes spotted with red: it occurs massive. The structure is radiated, the surface splendid and pearly: it is translucent and rather hard. Its specific gravity and constituent parts are the same as the former variety.

Sparry Anhydrite, or Cube-Spar; Chaux sulphatée laminaire, Haüy.—The prevailing colour is white, inclining to blue-grey, pale yellow, and red. It is more or less transparent, the lustre splendid and pearly: it refracts doubly. It is crystallized in rectangular four-sided prisms, and in six or eight sided prisms. It also occurs massive. It has a foliated structure, with a cleavage parallel with the sides of a rectangular prism, which is its primitive form. It scratches calcareous spar, but is easily frangible. The specific gravity is 2.9. Before the blow-pipe, it becomes glazed over with a white friable enamel, but does not melt and exfoliate like gypsum. It is met with in the salt-mines in the Tyrol, and in Switzerland, and also in the gypsum of Nottinghamshire. Scaly anhydrite is generally white, inclining to blue or grey: it occurs massive, has a confused foliated structure, and a splendid and pearly lustre. It is translucent on the edges, is easily frangible, and is soft. Specific gravity 2.9. According to Klaproth, the constituent parts are,

Lime	-	-	41.75
Sulphuric acid	-	-	55.
Muriate of soda	-	-	1.
			97.75

It occurs in the salt-mines of Hall in the Tyrol.

ANTHOPHYLITE. Its colour is between dark yellowish-grey and olive-brown: it occurs massive and crystallized in reed-shaped crystals, which appear to be four-sided prisms longitudinally streaked. The lustre is shining and pearly, approaching to metallic. The structure is radiated. It has a two-fold cleavage parallel with the sides of a rectangular prism. It is more or less translucent, yields to the knife, but scratches glass with difficulty. It is infusible before the blow-pipe. Its specific gravity is 3.2. The constituent parts are,

Silice	-	-	56.00
Alumina	-	-	13.30
Magnesia	-	-	14.00
Lime	-	-	3.33
Oxyd of manganese	-	-	3.
Iron	-	-	6.
Water	-	-	1.43
			97.06

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This mineral is allied to hornblende: it occurs at Königberg in Norway.

ANTHRACITE, or Anthracolite, flaty glance-coal and columnar glance-coal. Anthracite is that species of coal which has a shining lustre approaching to metallic, and burns without smoke. *Kilkenny coal* and *Welsh culm* are varieties of anthracite. See COAL.

ANTIMONY, Native, and Ores of. See ANTIMONY-Ores, and RED Antimony, Addenda.

APATITE. (See APATITE.) *Chaux phosphatée,* Haüy. Werner makes two sub-species of apatite, the common and conchoidal. The latter, or *conchoidal apatite,* has a conchoidal fracture: it has been called *asparagus stone.* Apatite has been discovered in Cornwall, and recently near Bovey in Devonshire. Massive apatite and earthy apatite have received from Werner the names of common phosphorite and earthy phosphorite. Phosphorite has nearly the same constituent parts as apatite, with an addition of a small portion of fluoric acid, about 2.50 per cent.

APHRITE. (See SCHAUM-Earth.) Aphrite is divided into *scaly aphrite, flaty aphrite, and sparry aphrite.*

APLOME, a mineral closely allied to garnet, but is supposed to have a different primitive form of the crystal or that of a cube. (See GARNET.) Aplome is considered by Jafelot as crystallized common garnet.

APOPHYLITE. See ZEOLITE.

AQUA, Marine. See BERYL.

ARENALITE. See EPIDOTE, Addenda.

ARKTIZITE, a name given by Werner to the mineral since called Wernerite. See WERNERITE.

ARRAGONITE. (See ARRAGONITE.) Since that article was written, the remarkable anomaly in the crystallization of this mineral has been partly explained by the discovery that it contains a portion of the carbonate of ironian, which is supposed to give a different form to its primitive crystal. The constituent parts, as given by Stromeyer, are,

Arragonite from Molina, in Arragon.

Carbonate of lime	-	-	94.57
Carbonate of ironian	-	-	3.96
Hydrate of iron	-	-	.70
Water	-	-	.30
			99.53

From Baftanes.

Carbonate of lime	-	-	94.82
Carbonate of ironian	-	-	4.08
Manganese and a trace of iron	-	-	.09
Water	-	-	.98
			99.97

Werner divides arragonite into common, columnar, and acicular. Arragonite occurs in trap rocks in various parts of Scotland, and we have acicular crystals of arragonite in lava from Vesuvius.

ARSENATE of Copper. See COPPER-ORES.

ARSENATE of Iron. See IRON-ORE, section *Cube-Ore.*

ARSENATE of Lead. See LEAD, Ores of.

ARSENIC, Native. See ARSENIC, Ores of.

ARSENIC Bloom. See PHARMACOLITE, Addenda.

ARSENIC Oxyd, and Arsenical Pyrites, or Marcasite. See ARSENIC, Ores of.

ASBESTUS, Common and Flexible, (see AMIANTHUS and ASBESTUS,) *Asbestus ligniform,* or wood asbestus. Its colour is

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wood-brown, and from its fibrous structure it presents the resemblance of wood.

ASBESTOUS Actinolite. See STRAHLSTEIN.

ASBESTOUS Tremolite. See TREMOLITE.

ASPARAGUS-STONE. See APATITE, *Addenda*.

ASPHALT, flag mineral pitch; *Bitume solide*, Häüy. (See ASPHALTUM.) Asphalt appears to be indurated petroleum: it occurs in veins, intersecting strata connected with coal strata, and near basaltic rocks.

ATACAMITE, muriate of copper. See COPPER-ORES, and SANDY Copper.

AUGITE, Pyroxene, Häüy. (See AUGIT.) Since that article was written, it has been discovered that augite forms a constituent part of many basaltic rocks in Great Britain, and that it is also a common constituent of almost all dark-coloured lava. (See VOLCANIC Products.) Augite occurs crystallized, and in angular and round pieces. The crystals are generally six or eight sided prisms, with dihedral summits. According to Häüy, the primitive form is an oblique rhomboidal prism, the alternate angles of which are $92^{\circ} 18'$ and $87^{\circ} 42'$. The colour of augite inclines to green and greenish-black: it is more or less translucent. Augite has generally a darker colour than olivine, and a greater hardness and specific gravity. They very frequently occur together in basalt and lava. Werner divides augite into four sub-species: *granular augite*, which is opaque, and has hitherto been found only at Arendal in Norway: *foliated augite*, the lustre of which is resinous-vitreous and internally shining, approaching to splendent; it occurs at Etna and Vesuvius, and in the basalt of Bohemia: *conchoidal augite*, which is sometimes of an olive-green colour, and has an imperfect flat conchoidal fracture: and *common augite*. There is also a variety of augite which occurs massive or disseminated, of a deep black colour and opaque; this has been called *slaggy augite*. The term pyroxene, or a franger to fire, given to this mineral by Häüy, is extremely inappropriate, as this mineral forms a constituent part of most dark-coloured lava.

AUTOMALITE, Spinelle zincifere, Häüy. (See RUBY.) This mineral is classed with the spinel-ruby. The specific gravity is from 4 to 4.2: it is remarkable for containing 28 per cent. of oxyd of zinc. It occurs imbedded in talcous slate at Fahlun, in Sweden.

AXINITE. See THUMMERSTONE.

AZURE-STONE, Lazulite, Häüy. See LAZULI LAPIS.

BASALT. See BASALT, *Addenda*, and WHIN-STONE, ROWLEY-Rag, and VOLCANIC Products.

BASALTIC Hornblende, Amphibole crystallizée, Häüy. This mineral is frequently confounded with schorl by the older mineralogists; it has a velvet-black or brownish-black colour; it occurs in irregular six-sided prisms, variously acuminated, but most frequently by flat trihedral pyramids with rhomboidal faces. The structure is lamellar, with joints in two directions parallel to the sides of an oblique rhomboidal prism, the alternate angles of which are $124\frac{1}{2}^{\circ}$ and $55\frac{1}{2}^{\circ}$. It is opaque, and has a splendent and vitreous lustre; it has a fine-grained uneven fracture; it scratches glass; and melts with difficulty into a black glass. The specific gravity is from 3.15 to 3.25. The constituent parts, as given by Klaproth, are

Silice	47
Alumine	26
Lime	8
Magnesia	2
Oxyd of iron	15
Water	.50
	98.50

It occurs in common basalt, in wacke, and in lava; also in some kinds of porphyry. It decomposes more slowly than basalt; hence, according to professor Jamefon, we frequently find crystals of basaltic hornblende dispersed through clay formed by the decomposition of basaltic rocks. See HORNBLLENDE, *Addenda*.

BASANITE, black flinty slate. See SLATE.

BERGMANNITE, a mineral which occurs massive with grey and red quartz at Freidichswan, in Norway, and is classed with scapolite in the felspar family in Jamefon's Mineralogy. Its colours are greenish and greyish-white, or yellowish-grey and muddy flesh-red. It is extremely glistening, with a lustre between pearly and resinous. The structure is delicately fibrous, curved, or diverging. It is faintly translucent on the edges, and scratches felspar. It melts before the blow-pipe without intumescing into a white enamel.

BERYL. (See BERYL and EMERALD.) In Weis's collection at Vienna, there are two crystals of beryl in a group crossing each other, which are a foot and a half in length, and one foot in diameter. It has been found in alluvial soil, in the upper part of Aberdeenshire, and in the county of Wicklow, in Ireland, imbedded in granite.

BILDSTEIN. See AGALMATOLITE.

BISMUTH, Native. See BISMUTH-Ore.

BISMUTH, Glance, or Sulphuretted Bismuth. See BISMUTH-Ore.

BISMUTH-Ore, Plumbo cupriferosus, has a steel-grey colour, with a pale copper-red tarnish. It occurs disseminated and crystallized in oblique four or six-sided acicular prisms, longitudinally streaked. The crystals are frequently adhering together, and are sometimes curved, and divided by cross rents. The lustre is metallic. The cross fracture is fine-grained and uneven. It yields easily to the knife. The specific gravity is 6.2. Before the blow-pipe, it melts into a steel-grey globule; by continuing the heat, it is partly volatilized, and deposits in the charcoal a yellow powder, after which there remains a red globule, containing a grain of cupriferosus metallic lead, which communicates a blueish-green colour to borax. According to John, the constituent parts are,

Bismuth	43.20
Lead	24.32
Sulphur	12.10
Sulphur	11.58
Nickel	1.58
Tellurium?	1.32
Gold	0.79
	94.89

It occurs near Berezof, in the district of Catharinensburg, in Siberia.

BISMUTH-Ore, Cupreous, or Cupriferosus sulphuretted Bismuth-Ore, has a light lead-grey colour, sometimes steel-grey and tin-white. It occurs massive, disseminated, and in diverging prisms. The lustre is metallic; it is sectile. According to Klaproth, the constituent parts are,

Bismuth	47.24
Copper	34.66
Sulphur	12.58
	94.48

This is a very scarce ore of bismuth.

BISMUTHIC Silver-Ore. See SILVER-Ore.

BITUMEN,

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The proportion of manganese and iron is sometimes much greater, and there are several intermediate varieties, which it is difficult to determine whether they are to be classed with brown spar or spar iron-ore. Brown spar occurs in veins along with galena and other ores of lead, in the mines of Cumberland and Northumberland. Fibrous brown spar, both massive and in balls, occurs in veins in Lower Hungary. Columnar brown spar has a splendent lustre and a foliated fracture, but no distinct cleavage can be observed in it. The fragments are wedge-shaped. It has been found at Gerfidorf in Saxony, and Guanaxto in Mexico. The name brown spar was given to this species because it changes its colour, on exposure to the air, from a light to a dark brown, bordering on black.

BUTTERMILK, Silber. See SILVER-ORES.

BYSSOLITE, a name given by Sauffure to a variety of asbestos actinolite, which occurs in minute acicular diverging crystals, which are elastic. See ACTINOLITE.

CACHOLONG, Quarz agate cacholong, Häüy, is by some mineralogists considered as a variety of milk-white chalcedony, by others as a kind of common opal. Cacholong is distinguished by its milk-white colour, its resinous lustre, its even fracture, and its want of translucency, except at the edges. It sometimes adheres when applied to the tongue. This mineral accompanies fints and chalcedony, and, according to Brongniart, even pitch-stone is sometimes coated with it; hence it is supposed to be the result of alteration in these minerals, produced by an unknown cause, as it is observed passing into them by almost imperceptible gradations. The true cacholongs, which have given the name to this variety, are found near the banks of the river Cach, in Bucharia; they are spread over the fields, but are not rounded; on the contrary, they form tables composed of alternate layers of cacholong and chalcedony. Cacholongs are sometimes cut and employed in jewellery.

CALAMINE. See ZINC-ORES.

CALCAREOUS Spar, crystallized carbonate of lime. See LIME-STONE.

CALC Sinter. See *Stalactical fibrous Lime-stone*, in the article LIME-STONE.

CALC Tufa, or Tufaceous Lime-stone, a light porous lime-stone, formed by the deposition of calcareous matter, in calcareous springs, or near lakes or rivers. It frequently encloses the remains of animals or vegetables which have been encased and imbedded in it by successive depositions. See TUFFA.

CALP, a name given by Kirwan to a dark ferruginous lime-stone, agreeing in many of its characters with the English lias. See LIAS, *Addenda*.

CANDLE Coal. Bituminous coal, so called on account of the great light which it affords in burning. See COAL.

CAT'S-EYE, Quarz agate chatoyant, Häüy; by some mineralogists called *falsé opal*. It appears to be a variety of agate occurring like the latter mineral in trap rocks, but remarkable for reflecting a peculiar play of colour, resembling that of the eye of a cat, whence its name; it is used in jewellery, and is generally cut into ring stones. Cat's-eye occurs massive and in loose angular and rounded pieces; its colours are various, inclining most frequently to yellowish and greenish-grey, and sometimes to brown-red and greyish-black. It exhibits a beautiful opalescence when cut in a spherical form, which proceeds from the fibrous structure, and sometimes from the intermixture of amianthus. It is translucent in different degrees; it has a shining vitreo-resinous lustre, a small conchoidal fracture; it scratches quartz. Cat's-eye becomes opaque and spotted by exposure to the

blow-pipe. Its specific gravity is 2.64. According to Klaproth, its constituent parts are,

Silix	95.00
Alumine	1.75
Lime	1.50
Oxyd of iron	0.25
	98.50

Cat's-eye occurs in the Hartz, in Hanover, in trap, with amianthus, albettus, axinite, and calcareous spar. It is brought from Ceylon, Malabar, Sumatra, Persia, and Arabia.

CELESTINE, sulphate of strontian. See STRONTIAN.

CERIUM, or Cerite, Cerium oxyde silicifere, Häüy, an ore of the newly-discovered metal cerium. (See CERIUM.) The colour is between rose-red and flesh-red, and also reddish-brown; when pulverized it is grey; it occurs both massive and disseminated. The fracture is splintery, the lustre glimmering and resinous. Opaque (Jamefon), transparent (Aikin). It scratches glass with difficulty; it is brittle and easily frangible. Specific gravity 4.6 to 4.9. Infusible before the blow-pipe, but changes from grey to yellow. According to Klaproth, the constituent parts are,

Oxyd of cerium	54.5
Silix	34.5
Oxyd of iron	3.5
Lime	1.2
Water	5.0
	98.7

Cerium occurs in a bed of copper pyrites, situated in gneiss, near Riddarhytta, in Westmannland, Sweden.

CEYLANITE, Pleonaste, Häüy, is classed with the ruby family by Werner: its colours are a muddy dark-blue and greyish-black, which approaches to iron-black; it occurs in grains and in small crystals, either perfect octahedrons or truncated on the edges, or with the angles acuminate by four planes, which are set on the lateral planes, also in rhomboidal dodecahedrons. The crystals are smooth and splendent; it is translucent on the edges. The fracture is flat conchoidal; it scratches quartz. Before the blow-pipe, it is infusible. The specific gravity of ceylanite is 3.8. According to Berzelius, the constituent parts are,

Alumine	27.25
Magnesia	14.63
Silix	5.48
Oxyd of iron	4.26
	51.62

This mineral was first found in the island of Ceylon, where it occurs in the sands of rivers with tourmaline, zircon, sapphire, and iron-sand. It occurs in lava from Vesuvius, with olivine, augit, and mica. It occurs also in basalt, near Andernach, on the Rhine.

CHABASIE and Chabasite. See ZEOLITE.

CHALCEDONY. See CHALCEDONY and QUARTZ.

CHALK. See CHALK, and GEOLOGY, *Addenda*.

CHIERT, a variety of horn-stone; it differs from flint principally by being more opaque, and having less lustre; it occurs in nodules and masses in the sand under the chalk formation, and in beds in some mountain lime-stone.

CHIASTOLITE, or Hollow Spar, occurs crystallized in slender rhomboidal prisms, the edges of which are sometimes rounded,

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rounded; sometimes four prisms are arranged in the form of a cross. The prisms appear composed of two distinct substances, as if they had once been hollow, and these hollows filled up with clay-slate, nearly similar to what the crystals are imbedded in. The exterior part of the prism is of a greyish-white or reddish colour, and varies in thickness, in some specimens being a mere shell; within this, is a dark-blue or black prism, exactly parallel to that by which it is inclosed. Frequently from each angle of the inferior prism a black line or thread proceeds, bisecting the corresponding angle of the white prism, and often terminated by a small black prism. The white part exhibits a lamellar structure, parallel with the lateral planes of the prism: it has a slight glistening lustre, is translucent, and scratches glass. The specific gravity is 2.9. Before the blow-pipe, it fuses into a whitish scoria; the black part affords a black glass. This mineral occurs in acicular crystals in some beds of dark slate in the mountain Skiddaw, Cumberland. The largest crystals are found in clay-slate, near St. Brieux, in Brittany. Some mineralogists consider chalcotale as the same substance as andaluite; others class it with common feldspar, and some regard it as a distinct species.

CHLORITE, Talc chlorite, Häuy. This mineral is nearly allied to talc and mica. The prevailing colour is various shades of green; hence it derives its name from the Greek *χλωρος*, green. It is divided by professor Jameson into four sub-species: earthy chlorite, common chlorite, slaty chlorite, and foliated chlorite.

Earthy Chlorite occurs massive and disseminated, and incrusting other minerals, and inclosed in dendritical forms in adularia and rock-crystal. It consists of fine scaly particles closely adhering, and has a glimmering or glistening pearly lustre, and feels rather greasy. The green colour becomes lighter in the streak. The specific gravity is 2.6. Before the blow-pipe, it melts into a blackish slag. According to Vauquelin, the constituent parts are,

Silex	-	-	26.50
Alumine	-	-	18.50
Magnesia	-	-	8.00
Muriate of soda and potash	}	-	2.00
Oxyd of iron		-	43.00
			98.00

According to Häuy, the scaly particles are regular hexagonal prisms when viewed with the microscope.

Common Chlorite is a leek or dark-green colour, intermixed with black. It occurs in rocks of various kinds, in beds and veins, either alone, or with quartz, magnetic iron-stone, iron-pyrites, hornblende, actinolite, and other minerals. It is amorphous, has a glimmering lustre, an earthy fracture, and a fine granular, laminated, or scaly structure. Common chlorite is soft, opaque, and greasy. Its specific gravity is 2.8. It occurs in various parts of Scotland, and in Cornwall, Cumberland, and all alpine parts of England.

Foliated Chlorite: Talc chlorite, Häuy.—Its colour is leek-green: it occurs crystallized in six-sided tables, curiously aggregated in cylindrical or conical forms. The crystals are longitudinally streaked. The lustre is resinous, either glistening or shining. The structure is curvately lamellar, with a single cleavage. It is opaque or translucent at the edges; it is soft, sectile, and rather greasy. The specific

gravity is 2.8. According to Lampadius, the constituent parts are,

Silex	-	-	35
Alumine	-	-	18
Magnesia	-	-	30
Iron	-	-	19
Water	-	-	3
			105

Foliated Chlorite is found in various parts of the continent of Europe, and on the island of Jena, one of the Hebrides.

Chlorite Slate has a greyish or darkish-green colour; it occurs in beds in clay-slate, sometimes associated with talc-slate, into which it passes. It has a glistening resinous lustre, a slaty structure, inclining to scaly. On minute examination, it appears composed of small scales of chlorite closely adhering. Chlorite-slate forms beds in mountains of clay-slate in various parts of the Grampian-hills. It passes into hornblende-slate and clay-slate. The specific gravity is 3.03.

CHLOROPHANE, a variety of fluor spar from Siberia, which gives out a beautiful apple-green light when placed on a heated iron. Pallas mentions a pale-violet blue variety spotted with green, which becomes phosphorescent when held in the hand, and gives out a pale-whitish light; in boiling water, it emits a green light, and at a higher temperature a blue light. See FLUOR SPAR.

CHROMATE of Iron, Fer chromate, Fr. has a pitch-black colour, with somewhat of an olive tinge superficially. It occurs massive and disseminated, and also crystallized in octahedrons. It has a shining lustre, between resinous and metallic. The fracture is uneven, or imperfectly small conchoidal, and sometimes imperfectly lamellar. It scratches glass, is opaque. The colour of the streak is ashy-grey or brownish. The specific gravity is 4.03. It is rarely magnetic, is infusible, but tinged borax of a beautiful green colour. According to Vauquelin, the constituent parts are,

Chrome of France.			
Oxyd of chrome	-	-	43
Oxyd of iron	-	-	35
Alumine	-	-	20
Silex	-	-	2
			100

According to Klaproth,

Chrome of Storia.			
Oxyd of chrome	-	-	55
Oxyd of iron	-	-	33
Alumine	-	-	6
Silex	-	-	2
Loss by heating	-	-	2
			98

Chromate of iron occurs in beds and veins, and in imbedded masses, in serpentine and talc-slate. It has been found at Portfoxy, in Bamshire, and is said to occur in considerable quantities in the Shetland islands. It occurs in the vicinity of Narites, and in the department of Van. The greatest quantity has hitherto been found in serpentine, in the Bare-hills near Baltimore. The chromic acid

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acid obtained from this mineral when combined with lead forms a beautiful yellow pigment, and is now an article of commerce.

CHROMATE of Lead, red lead-ore. See LEAD-ORES.

CHRYSOCOLLA, *Earthy Malachite*, *Criore malachite cryscolle*, Fr. See COPPER-ORE.

CHRYSOOLITE, *Peridot chrysolithe*, Fr. (See CHRYSOOLITE.) This gem is the softest of the precious stones; its colours change by heat. It is brought to Europe from the shores of the red sea. *Jamefon*.

CHRYSOPISE. Apple-green chalcidony coloured by the oxyd of nickel. (See CHRYSOPISE.) It has hitherto been found only in the vicinity of the towns of Glaffendorf, Grochau, and Kofemutz, in Lower Silesia. It is softer than common chalcidony. It is used in jewellery.

CIMOLITE. See CIMOLITE.

CINNABAR, *Mercure sulphuré*, Häüy. (See MERCURY-ORES.) Besides the localities of cinnabar there enumerated, various mines of cinnabar occur in New Spain. In the kingdom of New Granada, cinnabar is found in three different places in veins, and also in alluvial soil, mixed with gold. In Peru, cinnabar occurs in various parts, particularly near the town of Huancavelica, at the height of twelve thousand feet above the level of the sea. Cinnabar is found in veins near to Sillacara, intersecting alpine lime-stone; these veins, according to Humboldt, at present furnish all the mercury of Peru.

CINNAMON-STONE. This gem was originally found in the sands of rivers in Ceylon. It has been classed with hyacinth, but is a variety of garnet. Its colours are, hyacinth-red inclining to orange-yellow. It is found in blunted-angular or in roundish pieces. It has a shining vitreous lustre approaching to splendent. The fracture is flat and small conchoidal. It is transparent or semi-transparent, but generally full of cracks. It scratches quartz with difficulty. When cut it feels rather greasy. The specific gravity is 3.6. According to Klaproth, the constituent parts are,

Silix	-	-	-	-	38.80
Alumine	-	-	-	-	21.25
Lime	-	-	-	-	31.25
Oxyd of iron	-	-	-	-	6.50
					97.80

Before the blow-pipe, it fuses into a blackish enamel. When fire from flaws it is of considerable value.

CLAY, *Porcelain Clay*, *Potters' Clay*, and *Slate Clay*. See CLAY.

CLAY Iron-stone, *Argillaceous Iron-stone*; *Fer oxydé mafif*, Häüy. (See IRON-ORES.) The name has been inappropriately given to this species of iron-ore, as it frequently contains scarcely any alumine or clay in its composition. The following analysis of Defcotels, given in the Ann. de Chemie for 1812, N^o 251, will shew how greatly this species of ore varies in its composition.

	From Blancheland.	Geifantern.	Colebrookdale, Shropshire.
Oxyd of iron	54.0	38.60	50.0
Oxyd of manganese	2.4	1.8	2.6
Silix	12.0	32.0	10.6
Alumine	1.0	4.0	2.0
Magnesia	2.0	4.3	2.4
Carbonic acid and water	24.0	20.0	32.0

In these specimens, the iron was in the state of carbonate;

in others, it exists in the state of oxyd. According to Mr. Jamefon, it would appear that the carbonated iron-stones by decomposition lose their carbonic acid, and are in time converted into the oxydated varieties. In those common clay iron-stones which have a yellow or brown streak, the iron is in the state of hydrate; in those having a red streak in the oxydated state, and in most of the varieties having a grey streak, the iron is carbonated. When the carbonated varieties begin to decay they become soft, and assume a liver or reddish-brown colour. This species of iron-stone, besides occurring in numerous thin strata alternating with coal-shale and sand-stone in the coal formation, occurs in kidney-shaped and rounded nodules. The greatest repository of this ore in Great Britain is in the coal basin extending from Pembrokehire into Glamorganhire, on the borders of the Bristol Channel.

CLAY-SLATE, *Argillaceous Schistus*. See SLATE.

CLAY-STONE is nearly connected with basaltic and porphyritic rocks of the trap formation. It forms the basis of clay porphyries. The colours of clay-stone are blueish and yellowish-grey or yellowish-white, lavender-blue and brownish-red. It is sometimes spotted and striped. It has a fine earthy fracture, sometimes inclining to flaty or conchoidal. The fragments are angular and rather blunt-edged. It is opaque, yields to the knife, and is rather easily frangible. The specific gravity is 2.2. It occurs in various parts of Scotland, in North Wales, and in Shropshire.

CLINK-STONE, *Phonolite*, *Porphyry-slate*, *Felspath compatie fonnere*, Fr. has most frequently a greenish-grey colour. It occurs in beds of considerable magnitude in rocks of the trap formation. (See TRAP.) The principal fracture is flaty, with a scaly aspect and a glittering pearly lustre. The cross fracture is splintery and faintly glimmering. It occurs columnar and tabular, is translucent on the edges, and easily frangible. The thin tables yield a metallic sound when struck. The specific gravity is 2.8. It melts before the blow-pipe into a grey-coloured glass. According to Klaproth, the constituent parts are,

Silix	-	-	-	-	57.25
Alumine	-	-	-	-	23.50
Lime	-	-	-	-	2.75
Soda	-	-	-	-	8.10
Oxyd of iron	-	-	-	-	3.25
Manganese	-	-	-	-	0.25
Water	-	-	-	-	3.00

98.10

This mineral is regarded as principally composed of compact felspar. It passes into basalt, with which rock it is often associated.

COAL, *Black and Brown*. (See COAL, and COLLIERIES.) The coal called by the Germans glance-ore is described in that article as unflammable or Kilkenny coal. For a further account of it, see GLANCE-Coal, *Addenda*.

COBALT-ORES. (See COBALT.) Earthy cobalt-ore has been found in sand-stone at Alderly-edge, in Cheshire; and other ores of cobalt have recently been discovered in several mines in Cornwall.

COCCOLITE, *Pyroxene granuliform*, Häüy. A granular variety of augit. (See AUGIT.) The colour is various shades of green. It occurs in slightly coherent granular concretions, has a lamellar structure, a shining vitreous lustre, is more or less translucent, and scratches glass. The specific

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specific gravity is 3.3. According to Vauquelin, the constituent parts are,

Silex	50.0
Lime	24.0
Magnesia	10.0
Alumine	1.5
Oxyd of iron	7.0
Oxyd of manganese	3.0
95.5	

COLUMBITE, an ore of tantalum. See TANTALITE.

COMPACT *Felspar*. See FELSPAR, *Addenda*.

COPPER Nickel. See NICKEL-ORES, *Addenda*.

COPPER-ORES. (See COPPER-ORES, and PHOSPHATE of Copper, *Addenda*.) The following table of the annual quantity of copper raised in Europe is given in the last edition of Jamefon's Mineralogy, vol. iii. p. 196. The authority is not stated.

Quintals of 100 Pounds.	
England	200,000
Russia	67,000
Austrian dominions	60,000
Sweden	22,000
Kingdom of Westphalia in 1808	17,229
States of Denmark	8,500
Bavaria (including the Tyrol)	3,000
France	2,500
Saxony in 1808	1,320
Prussia after the treaty of Tilsit	0,337
Spanish European mines	0,309
Total of quintals 382,195	

CORNELIAN. See CHALCEDONY and AGATE.

CORUNDUM, *Corinden*, Fr. The French mineralogists class as varieties of corundum the oriental *ruby*, the *sapphire*, and *emery*. (See these articles.) Though they are principally composed of alumine, they are, excepting the diamond, the hardest of mineral substances, and nearly the heaviest of earthy minerals, the specific gravity being from 3.87 to 4.28. Common corundum, or adamantine spar, has a greenish-white colour: it is sometimes pearl-grey, brown, or red. It is translucent and sometimes nearly transparent, and is doubly refracting. It has a distinct lamellar structure, and splits into rhomboids, the angles of which are 86° 38' and 93° 22'. (See ADAMANTINE SPAR.) This mineral is found imbedded in granite, like felspar, in various parts of India, and also in North America, and imbedded in micaceous schist in Italy.

CROSS-STONE, *Harmotome*, Häuy. See ZEOLITE.

CRYOLITE, *Alumine fluatée*, Fr. This mineral has hitherto been found only in West Greenland. It occurs in two thin layers in gneiss. Its name is derived from the Greek word denoting ice, because this mineral melts almost like ice at a low heat. Its colours are pale greyish-white, snow-white, and yellowish-brown. It occurs massive and disseminated. It has a shining or glistering vitreous lustre, inclining to pearly, and is translucent. The structure is imperfectly lamellar, with joints in three directions parallel to the faces of a rectangular parallelepiped. It is softer than fluor spar, and is easily frangible. The specific gravity is 2.9. It becomes more translucent in water, but does not melt. Before the blow-pipe it first melts, then hardens,

and assumes the appearance of a slag. According to Klapproth, the constituent parts are,

Alumine	24
Soda	36
Fluoric acid and water	40
100	

According to Vauquelin,

Alumine	21
Soda	32
Fluoric acid and water	47
100	

CRYSOBERYL, *Cymophane*, Häuy. See CRYSOBERYL.

CUBE-ORE, *Arseniate of Iron*, *Fer arseniaté*, Häuy. See IRON-ORE.

CUPREOUS *Arseniate of Iron*, *Martial Arseniate of Copper*. See COPPER-ORES.

CYANITE, or *Kyanite*; *Sappare*, Sauffure; *Dorthene*, Häuy. See KYANITE, *Addenda*.

DATOLITE, (see DATHOLITE,) is composed of boracic acid, united with lime and flex. It occurs massive and crystallized in oblique four-sided prisms, generally truncated on the edges and angles. The primitive form of the crystal is stated by Hanfmann to be an oblique four-sided prism, with angles of 77° 30' and 102° 30'. It gelatinizes with acids. In the flame of a candle it becomes opaque and friable. Before the blow-pipe it intumesces, and then melts into a globule of a pale rose-colour.

DIALLAGÉ, *Smaragdit* of Sauffure; *Diallage verte*, Häuy. Its colours are grass-green and apple-green; it occurs massive and disseminated. The lustre is shining, glistering, and pearly; it is translucent on the edges. Diallage has a lamellar structure, with a two-fold nearly rectangular cleavage, only one of which is distinct. It is rarely so hard as glass. The specific gravity is 3. Before the blow-pipe, it melts into a grey or greenish enamel. According to Vauquelin, the constituent parts are,

Silex	50.00
Magnesia	6.00
Alumine	11.00
Lime	13.00
Chrome	7.00
Iron	6.30
Copper	1.50

Diallage is found in Corfica with saffurite, and on Mont Blanc in Switzerland; also in Carinthia and Transylvania. The mixture of diallage and saffurite is named *Gabbro* by the Italians, *Euphotide* by the French, and *Verde de Corfica duro* by artists. When cut and polished it has a beautiful appearance, and is made into various articles of ornament.

DIALLAGÉ *Metalloide*. See BRONZITE, HYPERSTENE, and SCHILLER SPAR, *Addenda*.

DIAMOND, *Diamant*. (See DIAMOND.) In addition to the characters of the diamond given under that article, it may be proper to state, that besides the colours there enumerated, the diamond occurs sometimes blue, red, brown, yellow, and green, with the following transitions. The only variety of blue is indigo-blue, which appears to pass into red. Of red, the varieties are rose-red and cherry-red. From the latter colour it passes into olive-brown, and yellowish-brown, ochre-yellow, orange-yellow, wine-yellow, and

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and fulphur-yellow; further into fiskein-green, asparagus-green, pistachio-green, leek-green, and mountain-green, which latter passes into greenish-grey and greenish-white.

The olive-brown passes into blackish-brown, pitch-black, and greyish-black.

Besides occurring crystallized, the diamond is also found in rolled pieces and grains. The crystallizations of the diamond, besides the octahedron and its varieties, are, the perfect tetrahedron; the tetrahedron with truncated angles, or with the angles acumined by three planes, set on the lateral planes; segments of the tetrahedron, either detached or united, forming twin crystals; the rhomboidal dodecahedron, with convex planes or faces; the same figure somewhat elongated; the dodecahedron, with the planes divided diagonally; an acute double six-sided pyramid, with the lateral planes set on each other, and the apex acumined by six planes set on the lateral planes; a flat double three-sided pyramid, with convex planes set laterally on each other, and the angles of the common base acumined by four planes set on the lateral planes; a flat double three-sided pyramid, on which the lateral planes of the one are set on the lateral edges of the other, and the angles of the common base truncated; a six-sided table, with oblique terminal plates; and lastly, the diamond has been found in a cubic form, either perfect or with the edges truncated, or variously modified.

The surface of the octahedron is either smooth or streaked; the external lustre of the natural diamond is adamantine, and alternates from splendid to glimmering; internally it is highly splendid. It is seldom completely transparent. The black diamonds are nearly opaque. The diamond has a four-fold equiangular cleavage parallel with the planes of the octahedron in this direction; it is rather easily frangible. The diamond scratches all other minerals. Its specific gravity is stated by Mr. Lowry at 3.488. The diamond, besides its other localities, is found in the district of Serro Dofria, in Brasil: it was first discovered there about the middle of the last century, in gullies of torrents, and the beds of rivers, where gold is also obtained, but for a very considerable time, the diamonds being unknown, were disregarded and thrown away. Diamonds occur also in other parts of Brasil, in the rivers Giquitignogna, Riacha Fundon, and Rio de Peixe. See GEM.

DIASPORE is regarded as a variety of wavelite. (See WAVELLITE.) It occurs in curved lamellar concretions easily separable from each other; it has a grey colour, a shining pearly lustre, the angular pieces cut glass. It flies before the blow-pipe, but is infusible. Its specific gravity is 3.43. According to Vauquelin, the constituent parts are,

Alumine	80
Water	17
Oxyd of iron	3
	100

DICHOITE. See IOLITE, *Addenda*.

DIOPSIDE. See ALALITE, *Addenda*.

DIOPHANE, *Emerald Copper Ore*, occurs in crystallized six-sided prisms, acumined by three planes set on the lateral edges: it is translucent, and scratches glass feebly. The specific gravity is 3.3. Häuy. According to Luvitz, the constituent parts are,

Oxyd of copper	55
Silex	33
Water	12
	100

A very small specimen analysed by Vauquelin gave forty-two per cent. of lime. This mineral is found, according to Hermann, in the land of Konguire, 125 leagues from the Russian frontier, where it is associated with malachite and calcareous spar.

DIPYRE. See ZEOLITE.

DISTHENE, or *Kyanite*; *Sappare*, *Sauffleure*. See KYANITE, *Addenda*.

DOLOMITE, a species of magnesian lime-stone, to which the name was given in honour of Dolomieu, the celebrated French Geologist. Mr. Jameson has classed the different kinds of magnesian lime-stone into one order, which he calls the dolomite family: it contains four species, dolomite, brown spar, mienite, and gurfosite. The dolomite species he has divided into four sub-species, *common dolomite*, *dolomite spar* or *rhomb spar*, *columnar dolomite*, and *compact dolomite* or *magnesian lime-stone*.

Common dolomite occurs in beds in primitive mountains, and frequently contains tremolite. It nearly resembles primitive lime-stone or statuary marble, the *chaux carbonatée saccharoide* of the French, but may be distinguished from it by the little effervescence which it yields on the application of mineral acids compared with the former. The grains of dolomite are also more loosely adhering than in white primitive lime-stone. The mineralogical characters of common dolomite are given under the article DOLOMITE. Dolomite generally phosphoreces when rubbed in the dark or heated. The constituent parts of different dolomites are given by Klaproth as under:

	St. Gothard.	Apperiones.	Carinthia.
Carbonate of magnesia	46.50	38.00	48.00
Carbonate of lime	52.00	65.00	52.00
Oxyd of manganese	0.25	-	-
Oxyd of iron	0.50	-	-
Loss	0.75	-	20
	100	103	100.20

Flexible dolomite is found in the mountain of Campo Longoman, St. Gothard.

DOLOMITE *Spar*, or *Rhomb Spar*. See BROWN *Spar*, *Addenda*.

DOLOMITE, *Columnar*, occurs in serpentine, in a mine at Mjals, in Russia, in straight prismatic concretions: its colour is pale greyish-white, the lustre vitreous inclining to pearly. It is feebly translucent. The specific gravity is 2.765. According to Klaproth, the constituent parts are,

Lime	28.20
Magnesia	19.74
Oxyd of iron	0.50
Carbonic acid	39.25
Water	11.31
Loss	1.

DOLOMITE, *Compact*, magnesian lime-stone. See MAGNESIAN *Lime-stone*, *Addenda*.

EGYPTIAN JASPER. See JASPER.

EALOLITE, *Fettstein*, Werner; *Piene-graffe*, Häuy. The colours of this mineral are dark-greenish or blueish-grey, and flesh-red; it is translucent in a low degree, and has a shining resinous lustre. The blueish varieties display a peculiar opalescence. It occurs massive, and has a distinct double cleavage. The fracture is uneven. It scratches glass, is rather

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rather easily frangible, and melts before the blow-pipe into a white enamel. When pounded it gelatinizes in acids. The specific gravity is 2.58 to 2.61. According to Klaproth, the constituent parts are,

Silex	-	-	-	46.50
Alumine	-	-	-	30.25
Lime	-	-	-	0.75
Potash	-	-	-	18.00
Oxyd of iron	-	-	-	1.00
Water	-	-	-	2.00
				98.50

According to Vauquelin,

Silex	-	-	-	44.00
Alumine	-	-	-	34.00
Lime	-	-	-	0.12
Potash and soda	-	-	-	16.50
Oxyd of iron	-	-	-	4.00
				98.62

This mineral has hitherto been found only in the rock named zircon sienite. (See ZIRCON Sienite.) It is classed by Mr. Jameson in the feldspar family; but is placed by Werner between jasper and cat's-eye.

ELASTIC Mineral Pitch, or *Elastic Bitumen*. Mineral crouchouc. *Bitume elastique*, Häüy. See BITUMEN.

ELECTRUM, an argenteriferous gold-ore, or native alloy. Its colour is a pale brass-yellow. It is not soluble either in nitrous or nitro-muriatic acid. It contains, according to Klaproth,

Gold	-	-	-	64
Silver	-	-	-	36
				100

It occurs at Schlangenber, in Siberia.

EMERALD, *Emeraude verte*, Häüy. See EMERALD.

False emeralds are sometimes offered for sale, which are either green fluor spar, green quartz, or prase. The emerald of Brasil is sometimes the green tourmaline. The true emerald is harder than quartz. The beryl and the emerald have both the same primitive form of the crystal or the hexahedral prism. The terminal planes of the emerald are rough, those of the beryl smooth. The emerald agrees in chemical composition with the beryl, both containing from thirteen to fourteen parts of the newly-discovered earth glucine; but the colouring matter of the emerald *chrome* is wanting in the beryl. See GEM.

EMERY, *Corindon granulaire*, Häüy. (See EMERY.) This mineral owes its hardness to an intermixture of blue corundum. See ADAMANTINE Spar, and CORUNDUM, *Addenda*.

EPIDOTE. (See PISTAZITE, and THALLITE. Under the latter article, for Arundel in Norway *r.* Arendal.) Epidote occurs at the Malvern-hills in Worcestershire, at Wallow Cragg near Kewick in Cumberland, and near Marazzion in Cornwall.

EPSOM Salt, *Native*, or sulphate of magnesia, occurs as an efflorescence at Hurlet near Paisley, and sometimes is found efflorescent on old walls, and on the surface of different rocks, particularly gypsum, sand-stone, clay, and compact lime-stone.

EUCLARE. See EUCLARE.

FÄHLERZ, Werner; grey copper ore. See COPPER-ORES.

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FELSPAR. (See FELSPAR.) The name of this mineral appears to be derived from the Saxon term *fell*, a mountain, still used in the northern counties of England; hence feldspar, in its original signification, denoted mountain spar. In the mineralogical systems of Werner and Mr. Jameson, the feldspar family comprises various species of minerals, which are supposed to be nearly allied to feldspar. The feldspar species is also divided into *adularia*, *glassy feldspar*, *Labrador feldspar*, *common feldspar*, *disintegrated feldspar*, and *compact feldspar*.

Adularia. (See FELSPAR.)—The forms of crystals of *adularia* are the same as those of common feldspar. It possesses double refraction. It melts before the blow-pipe into a transparent white glass. *Adularia* occurs in veins in granite and gneiss, in various parts of Aberdeenshire and Bamshire, in the isle of Arran, and in the granite of Switzerland, France, and Germany. The largest and most beautiful crystals are found in the mountain of Stelia, a part of St. Gothard. Rolled pieces having a beautiful pearly light are collected in the island of Ceylon. The variety which exhibits a strong pearly light is cut in a semi-globular form, and is sold under the name of *morn-stone*, and is usually worn as a ring-stone.

Glassy Feldspar occurs always crystallized in broad rectangular four-sided prisms, bevelled on the extremities. These crystals are very much cracked, and always imbedded. It is transparent, and has a splendid vitreous lustre internally. Its other characters agree with *adularia*. It occurs in pitch-stone and trap in various parts of Scotland.

Labrador Feldspar. See FELSPAR.

Common Feldspar occurs variously crystallized. Häüy enumerates more than twenty of its secondary forms; several of them are represented *Plate I. figs. 8, 9, 10, 11, 12, &c. Crystallography*. The primitive form is an oblique-angled parallelepiped. The structure is perfectly lamellar, with a double, very distinct, rectangular cleavage, and an oblique indistinct cleavage intersecting the two former. The four rectangular planes have splendid faces; the faces of the oblique cleavage are dull. This remarkable character is peculiar to feldspar, and may very frequently be observed in the rhomboidal fragments of this mineral. Feldspar has been frequently analysed with different results. According to Berzelius, the most probable composition of common feldspar, so far as we can calculate it from the many analyses of which we are in possession, is, that the alumine bears the same proportion to the potash as in alum, and that the silica contains three times the oxygen of the base. The following is therefore a comparison between the calculated and experimental results, according to the principles of Berzelius's new system of mineralogy. See SYSTEMS of Mineralogy.

	Vauquelin.	Klaproth.	Rose.	Calculated	Result.
Silica	64 - 62	- 68	- 66	-	66.26
Alumine	20 - 17	- 15	- 17	-	17.61
Potash	14 - 13	- 14	- 12	-	16.13
Lime	2 - 3	-	-	-	-
Protoxyd of iron	}	- 1	-	-	1

The lime and protoxyd of iron are regarded as accidental admixtures. Feldspar is one of the principal constituent ingredients of many of the rocks called primary, in many of the trap rocks, and many of the lighter-coloured lavas. It forms an essential constituent part of granite, gneiss, sienite, green-stone, and forms the base of many porphyries, and the rock called *subite-stone*. (See WHITE-STONE.) In green-stone, the feldspar is often tinged of a green colour, from the admixture of hornblende or augit. In many of the porphyries, it exists in a compact state, or as *compact feldspar*. The colours of compact feldspar are various shades of white, grey, green, or red. The

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Jamellar structure is nearly lost in many of the compact feldspars, particularly in those varieties which have little lustre. When it contains crystals of quartz or feldspar, it constitutes a feldspar porphyry. It forms extensive beds in many alpine districts. It is distinguished from horn-stone by its inferior hardness, fusibility, and its frequent intermixture with hornblende or mica.

Disintegrated Feldspar has generally a greyish-white colour. It occurs massive and in imbedded crystals which have the same form as common feldspar. It is glistening, glimmering, or dull, and soft and sectile. In some instances, it appears to be feldspar in a decomposing state; in others, to be a softer kind of feldspar in an unaltered state.

FIBROLITE, a mineral which occurs with corundum; it has a white or grey colour, is crystallized in rhomboidal prisms, the angle of whose planes are 80° and 100°. It has a fibrous structure, and an uneven cross fracture. Internally it is glistening. Fibrolite is harder than quartz. Its specific gravity is 3.21. According to Chenevix, the constituent parts are,

Alumine	-	-	-	58.25
Silex	-	-	-	38.00
Iron and loss	-	-	-	3.75
				100

FIGURE-STONE. Agalmetolite, or birliteen.

FISH-EYE-STONE, or ichtyophthalmite.

FLINT. See FLINT.

FLOAT-STONE, *Quarz netique*, Häuy; sometimes called swimming quartz. Its colours are yellowish-white and grey. It is dull, earthy, and friable, absorbs water and becomes translucent. Its specific gravity is less than water, being from 0.448 to 0.793. The constituent parts are,

Silex	-	-	-	91 to 98
Water	-	-	-	6
Carbonate of lime	-	-	-	2
Oxyd of iron and alumine	-	-	-	2

It is found at St. Oien, in the vicinity of Paris, along with flint, and sometimes contains the same petrifications as those found in flint. Flint is sometimes found in the centre of float-stone, and passes into it by gradation. Float-stone may therefore be considered as a porous state of flint.

FLOR FERRI, *Coralloidal Arragonite*, occurs in snow-white dendritical branches, either smooth or incrustated with points. It is found in the mines at Dufton Fell, Westmoreland; it is supposed by count Bournon to be formed by sublimation.

FLUOR SPAR, *Flus*, Werner; *Chaux fluatée*, Fr. See FLUOR SPAR.

FOLIATED *Granular Lime-stone*. The name given by Mr. Jamefon to crystalline primitive lime-stone, called by the French *chaux carbonatée sauroide*. See LIME-STONE, and LIME-STONE, *Addenda*.

Fossil-COPAL, or *Highgate Resin*, a resinous substance found in perforating the bed of London clay at Highgate. It appears to be a true vegetable gum or resin, partly changed by remaining in the earth. It gives out a resinous aromatic odour when heated, and melts into a limpid fluid. It takes fire when applied to the flame of a candle, and burns away entirely before the blow-pipe. The colour of fossil-copal is a yellowish-brown: it has a resinous lustre, is brittle, and yields easily to the knife. The specific gravity is 1.046.

FULLERS'-EARTH, *Argile finebrique*, French. See FULLERS'-EARTH.

GADOLINITE. See GADOLINITE.

GALENA, or *Sulphuret of Lead*, *Lead Glance*; *Plomb sulphuré*, Häuy. See LEAD.

GARNET, *Grenat*, French. (See GARNET, *Precious*, and GARNET, *Common*.) The garnet family of Werner and professor Jamefon, in their mineralogical systems, comprises the following minerals, supposed to have an alliance with garnet: leucite, vesuvian, groffalar, melanite, allochroite, garnet, granatite, pyrope, and cinnamon-stone. (See these articles in the preceding volumes, and in the *Addenda*.) In the British Museum, these minerals are classed together under the name of granatic substances, whereby the confusion of making the same word represent both the genus and species is avoided.

GLANCE-COAL, *Anthracite*. The coal which has a splendid lustre, and burns without flame. (See COAL.) It is principally composed of carbon, and passes into graphite, or black-lead. Werner divides glance-coal into three sub-species; conchoidal glance-coal, flaty glance-coal, and columnar glance-coal. See COAL.

GLAUBER Salt, *Native Glauberite*; *Sonde sulphatée*, Fr. occurs as a mealy efflorescence in the neighbourhood of some salt lakes, and occasionally encrusting sand-stone and marle-stone. It is sometimes stalaclitic, botryoidal, or crystallized in acicular crystals. According to Reufs, the glauber salt of Eger, in Bohemia, contains

Sulphate of soda	-	-	-	67
Carbonate of soda	-	-	-	16
Muriate of soda	-	-	-	11
Carbonate of lime	-	-	-	5
				99

GLASSY *Feldspar*. See FELSPAR, *Addenda*.

GLASSY *Tremolite*. See TREMOLITE.

GOLD. (See GOLD.) In addition to the localities of gold given under that article, we may state that native gold is found in some of the stream works of Cornwall, and, like the stream tin which accompanies it, was doubtless once a part of the metallic veins that have been destroyed by the natural disintegration of the rocks which these once intersected. We have seen globules of native gold the size of a pea in a matrix of quartz, in the possession of the Rev. Mr. Hennor, of Plymouth.

Native gold was found in alluvial soil in various parts of Scotland, and was once extensively worked at the lead-hills. In the time of queen Elizabeth, it is said that three hundred men were employed in searching for it, and that in the course of a few summers a quantity was collected equal to 100,000*l*. sterling. Gold was obtained a few years since in a ferruginous sand in Ireland, near Arklow, in the county of Wicklow. One mass of pure gold weighing twenty-two ounces was found, which was the largest piece hitherto discovered in Europe. The total amount of gold exported to Europe annually from the Spanish and Portuguese colonies in America is stated by Humboldt at 45,580 pounds troy, of which 25,000 pounds weight comes from the Spanish colonies; the remainder from the Portuguese, principally from the Brazils, where it is collected by washing the sands of rivers and alluvial deposits. Gold is found almost every where along the feet of these immense mountains which run in a chain nearly parallel with the coast, from 5° to 30° of south latitude. Many of the silver-ores in America are also rich in gold. (See SILVER.)

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SILVER.) For a more particular account of these repositories of the precious metals, we must refer our readers to the various travels of M. Humboldt, to whom we are indebted for almost all the correct information we have respecting the European colonies in South America. The quantity of gold and silver imported from these colonies between the years 1492 and 1803, he states at eleven hundred and sixty-six millions in pounds sterling; an amount somewhat exceeding that of the present national debt of England!!

GRAMMATITE, *Tremolite*. See TREMOLITE.
 GRANULAR *Lime-stone*, statuary marble; *Chaux carbonatée saurcride*, Fr. See LIME-STONE, and LIME-STONE, *Addenda*.

GRAPHIC Gold and *Graphic Tellurium*. See TELLURIUM.

GRAPHITE. Plumbago or black-lead, (see PLUMBAGO,) has an iron-grey colour, and a glimmering or glistening metallic lustre. It is sectile, and when fresh cut has a lead-grey colour: it is unctuous to the touch, yields to the nail, and leaves a distinct lead-grey mark on paper. Before the blow-pipe it gradually burns away, leaving a portion of red oxyd of iron. According to Berthollet, the constituent parts are,

Carbon	-	-	-	-	90.9
Iron	-	-	-	-	9.1

The graphite of Borrowdale occurs with ochreous and unctuous clay; it is found in nodules and masses of various sizes. The bed in which it is found lies in a rock of grey porphyrite felspar, which has been improperly called grey wacke. Three beds of sealy graphite have lately been discovered in a rock of mica-slate or gneiss, near Buley, in Inverness-shire.

GREEN Earth, *Chlorite zographique*, French. This mineral, though made a distinct species by Werner, appears to be soft earthy chlorite (see CHLORITE): it generally occurs in cavities or incrusting agates in amygdaloid. It is of various shades of green, is soft and sectile, and adheres slightly to the tongue. The specific gravity is 2.5. Before the blow-pipe, it is converted into a black slag. It is used as a green colour in water-painting. When slightly burned, it affords a beautiful and durable brown.

GRANATE, *Staurolite*, Häüy; the staurolite of some mineralogists. (See STAUROLITE.) This mineral is classed in the garnet family by Werner; but it varies from garnet in the form of its crystal, which is an oblique four-sided prism, truncated on the acute lateral edges. Sometimes it is bevelled on the extremities by two planes set on the lateral edges, and the edge of the bevelment is truncated. The crystals sometimes intersect each other, forming a cross; hence it has been called cross-stone by some mineralogists: but it is a very distinct species from the *harmotome*, or cross-stone, which is a member of the zeolite family. (See ZEOLITE.) The colour of granate is dark reddish-brown. It is infusible before the blow-pipe. The above characters distinguish it from precious garnet. It occurs imbedded in mica-slate, and in talc, generally accompanied with kyanite and precious garnet.

GREY Antimony-Ore. (See ANTIMONY-ORES.) Grey antimony occurs in some of the mines in Cornwall in considerable quantities, particularly at St. Stephen's, Padstead, and Huel bays. It is found also at Glendenning, in Dumfriesshire.

GREY Cobalt-Ore. (See COBALT-ORE.) This mineral is found at Herland and Dolecoth mines, and in some other veins, in Cornwall.

GREY *Manganese-Ore*. See MANGANESE.
 GYPSUM, selenite; *Chaux sulfatée*, Häüy. See GYPSUM.

HARMOTOME, *Cross-stone*. See ZEOLITE.

HÄÜYNE, *Latialite*, Häüy. A mineral classed by the German mineralogists with the azure-stone, or lapis lazuli family. It was first discovered in the volcanic rocks of Albano and Praefati, and called *latialite*, from ancient Latium, and was afterwards discovered in the basaltic rock of Andernach, and has been called *Häüyne*, in honour of the celebrated mineralogist Häüy. Häüyne has a sky-blue colour, passing into pale Berlin-blue and blueish-green. It occurs in imbedded grains, and crystallized in minute splendid rhomboidal dodecahedrons. The fracture is conchoidal, passing into uneven; it has a vitreous lustre, is transparent or semi-transparent, scratches glass, and is infusible before the blow-pipe. When pulverized, it gelatinizes with muriatic acid, giving out an odour of sulphuretted hydrogen. The specific gravity is from 3.1 to 3.3. According to Vauquelin, the constituent parts are,

Silice	-	-	-	-	30.0
Alumine	-	-	-	-	15.0
Sulphate of lime	-	-	-	-	20.5
Potash	-	-	-	-	11.0
Iron	-	-	-	-	1
Water	-	-	-	-	17.5
					95.0

It has by some mineralogists been classed with sapphire, and described under the name of *saphirin*. It was arranged by Cordier with spinel.

HEAVY SPAR, *Sulphate of Barytes, Baro-Selenite*. This mineral exceeds in weight all other purely earthy minerals, its specific gravity being from 4.3 to 4.49. It occurs both massive and crystallized in many metallic veins. Its colours are various shades of white, yellow, red, greenish-grey, and blue. Crystallized heavy spar is transparent or translucent, and refracts doubly; it has a distinct lamellar structure, and splits into a right-rhomboidal prism, which is its primitive form; the angles of the rhomb are $101\frac{1}{2}^\circ$ and $78\frac{1}{2}^\circ$. The joint parallel to the base of the rhomb is the most distinct. The lustre is shining, between vitreous and resinous: it yields readily to the knife. Before the blow-pipe it decrepitates violently, and then melts into a hard white enamel. A piece exposed to the blow-pipe, and laid on the tongue, gives the flavour of sulphuretted hydrogen. The powder of some varieties of heavy spar, when calcined, absorbs light, and emits it again in the dark. Sulphate of ironian (see STRONTIAN) is the only earthy mineral with which heavy spar can probably be confounded. White lead-ore may be distinguished from heavy spar, as it is softer, and yields a metallic globule before the blow-pipe. Pure heavy spar consists of

Barytes	-	-	-	-	67
Sulphuric acid	-	-	-	-	33
					100

Mr. Jameson makes the following varieties of heavy spar, which he classes as sub-species: earthy heavy spar, compact heavy spar, granular heavy spar, lamellar heavy spar, radiated heavy spar, fibrous heavy spar, and prismatic heavy spar; and he divides lamellar heavy spar into three kinds, straight lamellar heavy spar, curved lamellar heavy spar, and disintegrated lamellar heavy spar.

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Earthy Heavy Spar occurs sometimes loose, and sometimes cohering in the drusy cavities in veins: it is composed of dull or glimmering drusy particles, which feel meagre.

Compact Heavy Spar occurs massive, disseminated, reniform, semi-globular; it has a coarse earthy fracture, and is sometimes imperfectly foliated; it has a glimmering lustre, is slightly translucent, soft, and easily frangible. It is often marked with dendritic delineations. According to Welfrumb, it contains

Sulphate of barytes	83
Silex	6
Alumine	1
Water	2
Oxyd of iron	4
	96

In Derbyshire, this mineral is called *cawk* by the miners.

Granular Heavy Spar occurs massive: the structure is finely granular; the structure of the grains is lamellar. This mineral nearly resembles granular lime-stone, but is much heavier, and does not effervesce with acids.

Lamellar, or Crystallized Heavy Spar, occurs in the following secondary forms. 1. A rectangular four-sided table, either perfect, or with the terminal planes bevelled, and sometimes the angles of the bevelment are truncated. 2. An oblique four-sided table, perfect, or with the angles or edges truncated. 3. A longish six-sided table, either perfect or variously bevelled. 4. Eight eight-sided tables, either perfect, bevelled, or truncated. Curved lamellar heavy spar occurs in distinct concretions, which have a curved lamellar structure.

Fibrous Heavy Spar has a chestnut-brown colour. It occurs in reniform or botryoidal masses, and has a plumose or diverging fibrous structure.

Radiated Heavy Spar, or Bolognese Spar.—Its colours are, smoke-grey, ash-grey, or yellowish-white. It occurs in roundish compressed pieces, which are always covered with marle or clay. The structure is lamellar in one direction, and in the longitudinal fracture radiated: it is translucent. It is remarkably phosphorescent after being heated and exposed when cool to the light, and carried into a dark room. It was first found at Monte Paterno, near Bologna. Its constituent parts are,

Sulphate of barytes	62
Lime	2
Silex	16
Alumine	14.75
Oxyd of iron	0.25
Water	2
	97

Columnar Heavy Spar: Baryte sulphatée bacillaire, Häüy. —Its colours are, yellowish, greyish, and greenish-white. It occurs crystallized in acicular oblique four-sided prisms, laterally aggregated into columns; the lustre is shining and pearly: it is translucent, and has a lamellar structure.

Prismatic Heavy Spar is heavy spar crystallized in four-sided or six-sided prisms, variously acuminated and modified by bevelments and truncations.

Hepatic, Baryte sulphatée fœide, Häüy, may be classed as a variety of heavy spar, which possessed the property of yielding a fetid sulphureous odour when heated or rubbed. It occurs in globular masses, from an inch to a foot in

diameter; these masses have a curved lamellar structure. According to John, the constituent parts are,

Sulphate of barytes, with a trace of strontian	93.58
Sulphate of lime	3.58
Oxyd of lime	0.87
Water, carbonaceous matter, sulphur, and alumine	2.00
	100.03

According to Klaproth,

Sulphate of barytes, with a trace of strontian	85.25
Carbon	0.50
Sulphate of lime	6.00
Oxyd of iron	5.00
Alumine	1.00
Lofs, including water and sulphur	2.25
	100.00

Hepatic occurs at Buxton, in Derbyshire.

HELIOTROPE, Quarz agathe ponctué, Häüy.

HEMATITE, Black and Brown; Fer oxydé hematite, Häüy.

HEMATITE, Red; Fer uligine concretione, Häüy. See IRON-ORES.

HEPATIC PYRITES, or Lower Pyrites. See PYRITES.

HEPATITE. See HEAVY SPAR, *Addenda*.

HIGGATE-RESIN. See FOSSIL-COPAL, *Addenda*.

HOLLOW SPAR. See CHIASTOLITE, *Addenda*.

HONEY-STONE. See MELLITE.

HORN-STONE, a mineral nearly allied in composition to flint, but has a more earthy texture; it received its name from the supposed resemblance to horn. A more opaque variety of flint, which occurs along with flint and chalcadonic flint in the sand strata below chalk, is called chert. (See *CHERT, Addenda*.) This is a kind of horn-stone. Horn-stone is the *petro-silex* of some mineralogists, and under that name is often confounded with *compact feldspar*. Indurated slate, which contains a large portion of siliceous matter in its composition, is sometimes called *horn-stone/slate*. Sauffure, under the names of palioptre and neoptre, appears to include both the splintery horn-stone and flinty slate of Werner. Werner divides horn-stone into three sub-species, splintery horn-stone, conchoidal horn-stone, and wood-stone.

Splintery Horn-stone occurs of various shades of grey, red, and green. It is generally massive, but sometimes is found in large balls, and sometimes lenticular, or in the form of crystals, in the cavities where crystals have once occurred, and hence called *supposititious crystals*. The lustre is dull, the fracture splintery; it is more or less translucent, is somewhat less hard than quartz. It is infusible before the blow-pipe, which distinguishes it from compact feldspar. The latter mineral is not so hard as horn-stone, and has more lustre. Horn-stone passes into compact feldspar, quartz, common jasper, and chalcadonic flint. In these transitions, it is frequently difficult to determine among which of these it should be placed. It forms the basis of horn-stone porphyry.

Conchoidal Horn-stone is glimmering or glitening, with a vitreous lustre; it has a more or less perfect and flat conchoidal fracture. It is harder and less translucent than splintery horn-stone. It occurs massive, globular, and sometimes forms *supposititious crystals*. It is found in veins and beds. Chert appears to belong to this sub-species.

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Wood-stone, Quarz agathe xyloide, Häuy, is generally various shades of grey, frequently striped or clouded. It occurs rounded, and in the shape of the trunks, branches, or roots of trees; it is generally translucent at the edges, with little or no lustre. The cross fracture is imperfectly conchoidal, the longitudinal splintery and fibrous. Wood-stone is properly wood silicified, in which the greater part of the vegetable matter has disappeared, and siliceous matter has occupied the place, preserving the form and texture of wood. Some wood is petrified with opal, forming wood opal; and sometimes the mineral matter of petrified wood is quartz, or calcareous earth.

HORNBLENDE, *Amphibole*, Häuy. The description of this mineral, so important in geology, was omitted in the proper place, and is given here. Hornblende may be divided into common hornblende, basaltic hornblende, and hornblende slate. Häuy, under the term amphibole, classes actinolite with hornblende. (See ACTINOLITE.) Hornblende generally occurs of various shades of dark green passing into black; sometimes common hornblende occurs of various shades of brown. Hornblende has a lamellar structure longitudinally, with a two-fold oblique angular cleavage, parallel to the planes of a rhomboidal prism, the alternate angles of which are $124\frac{1}{2}^\circ$ and $56\frac{1}{2}^\circ$. This is the form of the primitive crystal, and distinguishes it from epidote, which cleaves at an angle of $114\frac{1}{2}^\circ$ and $65\frac{1}{2}^\circ$, and augit or pyroxene, which cleaves at an angle of 92° and 88° . The cross fracture of hornblende is coarse-grained, uneven; it melts easily before the blow-pipe into a greyish-black coloured glass. These characters, together with the cleavage, serve to distinguish hornblende from augit or epidote; its inferior hardnets distinguishes it from schorl.

Common Hornblende occurs both massive, disseminated, and crystallized; the crystals are oblique four-sided prisms, aggregated or long flattened prisms, intersecting each other, or confusedly radiated. The structure is lamellar or bladed. The crystals are long and deeply streaked longitudinally. The lustre is shining and pearly. The black-coloured varieties are opaque; the green generally translucent at the edges. It yields pretty easily to the knife, leaving a greenish-grey streak. It is very tough, and becomes indented by the stroke of a hammer. The specific gravity is from 3.20 to 3.28. According to Klaproth, the constituent parts are,

Silex	-	-	-	42.00
Alumine	-	-	-	12.00
Lime	-	-	-	11.00
Magnesia	-	-	-	2.25
Oxyd of iron	-	-	-	30.00
Ferruginous manganese	-	-	-	0.25
Water	-	-	-	0.75
A trace of potash	-	-	-	0.00
				98.25

This mineral occurs forming beds in mountains, or is disseminated, as a constituent part of many compound rocks. It occurs occasionally in granite, gneiss, mica-slate, and slate, and is an essential part of sienite and green-stone. It forms a constituent part of many basaltic and volcanic rocks, but has frequently been confounded with augit. (See VOLCANIC PRODUCTS.) Hornblende occurs abundantly in various parts of Scotland and in England, particularly at the Malvern-hills in Worcester-shire, and at Charwood forest in Leicester-shire, and in Devonshire, Cornwall, and Cumberland.

Basaltic Hornblende, Amphibole schorlique basaltique, Fr. is

distinguished from common hornblende by its velvet-black colour, and more perfect crystallization. It occurs crystallized in unequiangular six-sided prisms, terminated at each extremity by a trihedral pyramid, with rhombic faces. It is sometimes terminated diffusimilary at each extremity, and sometimes acuminated by four or more planes. The angles of the cleavage have been already defined. Basaltic hornblende has a splendid vitreous lustre. The fracture is fine-grained, uneven, and glittering. It is black, opaque, and scratches glass. It is more fragile than common hornblende, and melts with greater difficulty. The specific gravity is from 3.15 to 3.19. According to Klaproth, the constituent parts are,

Silex	-	-	-	47.00
Alumine	-	-	-	26.00
Lime	-	-	-	8.00
Magnesia	-	-	-	2.00
Oxyd of iron	-	-	-	15.00
Water	-	-	-	0.50
				98.50

It occurs imbedded in basalt, as at Arthur's seat, near Edinburgh, and in various parts of Scotland. It is frequently found in lava, particularly in the lava of Vesuvius. It was formerly confounded with schorl, until Werner pointed out its characters.

Hornblende-Slate occurs in beds in granite, gneiss, and mica-slate; in the latter rocks, it is often much intermixed with mica, and sometimes contains garnets, as is the case near Tyndrum in Perthshire. Its colour is greenish-black. It has in the mass a slaty structure, and is internally laminar or fibrous, and has a glittering or velvet-like lustre. No very well characterized beds of hornblende-slate occur in England.

HORN-MERCURY, *Mercuré muriaté*, Häuy. See MERCURY-Ores.

HORN-SILVER, *Argent muriaté*, Häuy. See SILVER-Ores.

HUMITE occurs at mount Somma near Naples, in a granular topaz rock, intermixed with brown and olive-green mica and white Häuyne. Its colour is reddish-brown; it occurs crystallized in octahedrons, which are always more or less truncated and bevelled; the planes are frequently transversely streaked; it has a shining lustre, and is transparent; it scratches quartz with difficulty. This mineral was named humite in honour of sir Abraham Hume, by the count de Bournon, who has given the preceding characters of it in his *Catalogue Mineralogique*.

HYACINTH, *Zircon hyacinth*. See ZIRCON.

HYALITE, *Muller glass*, Werner; *Quarz concretioné*, Häuy. (See HYALITE.) The specific gravity of this mineral is given in the last edition of professor Jamefon's Mineralogy at 2.47, from Karsten. Its constituent parts are given by Bucholz as under:

Silex	-	-	-	92
Water	-	-	-	6.33
Trace of alumine	-	-	-	
Loss	-	-	-	1.66
				99.99

HYDRATE of Magnesia has a white colour with a greenish tinge; it occurs massive, has a lamellar-bladed structure, a pearly-lustre, and is more or less semitransparent, but becomes

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comes opaque by exposure to the air. The lamellæ are somewhat elastic; it is soft, and adheres slightly to the tongue. Specific gravity 2.3. It is infusible, but soluble in muriatic acid. According to Vauquelin, the constituent parts are,

Magnesia	-	-	64
Water	-	-	29
Oxyd of iron	-	-	2.5
Silex	-	-	2
			<hr style="width: 50%; margin: 0 auto;"/>
			97.5

HYDROPHANE. See **OPAL**, *Addenda*.

HYPERSTENE, *Labrador Hornblende*; *Diallage metalloide*, Häüy. Its colours are, dark-greyish, brownish, or greenish-black, with generally a pseudo-metallic lustre, reflecting a copper-red, a pinchbeck-brown, or a gold-yellow light. It occurs both massive and disseminated; it has a lamellar structure and a two-fold cleavage, the planes forming angles of 100° and of 80°. It is opaque, and yields a greenish-white streak. It is harder than common hornblende. Its specific gravity is 3.38. Before the blow-pipe it blackens, but is infusible. According to Klaproth, the constituent parts are,

Silex	-	-	54.25
Magnesia	-	-	14.00
Alumine	-	-	2.25
Oxyd of iron	-	-	24.50
Lime	-	-	1.50
Water	-	-	1
Manganese, a trace			
			<hr style="width: 50%; margin: 0 auto;"/>
			97.50

Until very recently, this mineral had only been found on the coast of Labrador, where it forms a constituent part of a rock composed of Labrador felspar, and sometimes containing common hornblende and magnetic iron-stone. It has been lately discovered by Dr. Macculloch in sienite, at Lock Scavig in Skye, also near Portloch, and is supposed to exist in many rocks which have hitherto been designated green-stones.

ICHTHYPHthalmite, *Apophyllite*, Häüy. See **ZEOLITE**.

IDOCRASE, *Vesuvian*. See **VESUVIAN**.

INDIANITE, a mineral brought from the Carnatic, of which we have the following account by its discoverer the count de Bournon. Its colours are white and grey, its lustre shining; it has a lamellar structure, is translucent inclining to transparent; it scratches glass, but is less hard than felspar; it occurs massive, and is associated with hornblende. Its specific gravity is 2.74. According to Chenevix, the constituent parts are,

Silex	-	-	42.5
Alumine	-	-	37.5
Lime	-	-	15
Iron	-	-	3
A trace of Manganese			
			<hr style="width: 50%; margin: 0 auto;"/>
			98

INDICOLITE, Indigo blue, tourmaline. See **TOURMALINE**.

IOLITE, *Dichroite*, occurs principally crystallized, in small equiangular and equilateral six-sided prisms, which have rough surfaces. The colour is violet-blue, or dull

prussian blue, but when viewed by transmitted light at right angles to the axis of the prism is a brownish-yellow. The structure is indistinctly lamellar, with joints passing through the axis at right angles to the lateral faces of the prism. The fracture is uneven, passing into conchoidal. It passes from translucent to opaque. Iolite scratches quartz. Its specific gravity is 2.5. It is not affected by acids. Before the blow-pipe, it melts with difficulty into a greenish-grey enamel. This mineral occurs at Cape de Gate, in Spain; it is found imbedded in fragments of gneiss and compact felspar, contained in what is supposed by Cordier to be a volcanic tufa, which contains, besides blocks of scoria, obsidian and basalt. Iolite has also been found in trap at Arendal in Norway.

IRIDIUM, *Native*, has a pale steel-grey colour; it occurs in flat small irregular grains in alluvial soil in South America. It has a shining metallic lustre, a lamellar structure, is brittle and harder than platina. The specific gravity is 19.5. It is proved by Dr. Wollaston to be an alloy of *Iridium* and *Osmium*; which see.

IRON-CLAY is of a reddish or brownish-red; it occurs massive and vesicular, as the bases of some amygdaloids which form beds in basaltic rocks. It is intermediate between basalt and wacke, having less hardness than the former, and more than the latter. It is also more easily frangible than either basalt or wacke.

IRON-FLINT is generally of a brown or brownish-red colour; it is opaque and hard, and has an imperfect conchoidal fracture. It occurs massive in rounded pieces, and crystallized in small equiangular six-sided prisms. Its specific gravity is from 2.5 to 2.8. It is infusible. This mineral appears to be quartz rendered opaque by a chemical combination with iron. According to Bucholz, the constituent parts are,

Silex	-	93	-	92
Oxyd of iron	-	5	-	5.75
Volatile matter	-	1	-	1
Oxyd of manganese	-	-	-	1
			<hr style="width: 50%; margin: 0 auto;"/>	<hr style="width: 50%; margin: 0 auto;"/>
			99	99.75

Pebbles of iron-flint are used at Worcester for burnishing the gilding in china. They have sometimes been found in considerable quantities in the ploughed fields near Ashby-de-la-Zouch in Leicestershire.

IRON-MICA. Micaceous iron glance, or iron-ore. See **IRON-ORES**.

IRON, *Native*. See **IRON-ORES**.

IRON, *Native and Meteoric*, *Fer native meteorique*, Häüy, is the iron which has been observed in various places to fall from the atmosphere. See **STONE**, *Meteoric*, **FALLING STONE**, and **METEORIC IRON**, *Addenda*.

IRON-ORE and *Iron-Stones*. (See **IRON**.) We shall here enumerate the different species of iron-stone, with the names given to them by the French and German mineralogists.

Iron Pyrites, Common; *Fer sulphuré*, Häüy; *Gemeiner schwefelkies*, Werner. *Capillary Pyrites, Fer sulphuré capillaire*, Häüy; *Haarkies*, Werner. *Cellular Pyrites, Zellkies*, Werner. *Radiated Pyrites, Fer sulphuré radié*, Häüy; *Strahlkies*, Werner. *Hepatic, or Liver Pyrites, La pyrite hepaticque*, Brochant; *Leberkies*, Werner. *Magnetic Pyrites, Fer sulphuré fersifere, ou magnétique*, Häüy; *Magnetkies*, Werner. *Foliated Magnetic Pyrites, Blätlicher magnetkies*, Werner. For an account of these species, see **PYRITES**, and **IRON-ORE**.

IRON-STONE, *Magnetic, Common, Fer oxydulé*, Häüy; *Gemeiner*

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Gemeiner magnetstein, Werner. This ore is highly magnetic with polarity. According to Berzelius, it contains

Peroxyd of iron	71.86
Protoxyd of iron	28.14
	100

It occurs in various parts of the world, chiefly in primitive mountains; it is found at St. Just in Cornwall, and Tavistock in Devonshire.

Iron-sand, or *Sandy Magnetic Iron-stone*, *Fer oxydulé titanifère*, Häuy, (see IRON-ORE,) occurs in volcanic and basaltic rocks, forming a component part of many black lavas, and in the sands of rivers. According to Cordier, its constituent parts are,

Iron-sand, Teneriffe.	
Oxyd of iron	79.2
Oxyd of titanium	14.8
Oxyd of chrome, a trace	
Oxyd of manganese	1.6
Silex and alumine	0.8
	96.4

According to Thompson,

River Dee, Aberdeenshire.	
Oxyd of iron	85.3
Oxyd of titanium	9.5
Arsenic	1.0
Silex and alumine	1.5
	97.3

Earthy Magnetic Iron-stone; *Fer oxydulé fuligineux*, Häuy; *Ochziger magnetstein*, Werner.—The colour is blueish-black; it is opaque, soft, sectile, and easily frangible. It appears to be common magnetic iron-stone in a state of decomposition. Common magnetic iron-stone and iron-sand are distinguished from iron-glance by the colour of the streak, which is black; but that of iron-glance is red. According to Mr. Jamefon, Werner was the first who observed that magnetic iron-stone does not possess the magnetic property when at a depth in the earth, but it acquires it after exposure to the atmosphere.

Specular Iron-ore, or *Common Iron Glance*; *Fer oligiste*, Häuy; *Eisenglanz*, Werner.—This ore, according to different analyses, appears to contain about 90 per cent. of oxyd of iron. See IRON-ORES.

Scaly Red Iron-ore, or *Iron Froth*; *Fer oligiste rouge luisant*, Häuy; *Rother eisenrahm*. *Ochry Red Iron-stone*; *Fer oxydé rouge grasster*; *Ochziger rotherstein*, Werner.

Compact Red Iron-stone; *Fer oligiste compacte*, Häuy; *Dichter rotherstein*, Werner.

Red Hematite, or *Fibrous Red Iron-stone*; *Fer oligiste concrétionée*, Häuy; *Rother glaskopf*, Werner. See IRON-ORES.

Scaly Brown Iron-ore; *Brauner eisenrahm*, Werner. *Ochry Brown Iron-stone*; *Fer oxydé pulverulent*, Häuy. *Compact Brown Iron-stone*; *Fer oxydé brun compacte*, Fr.; *Dichter braun eisenstein*, Werner. *Brown Hematite*; *Fer oxydé hematite brun*, Häuy; *Brauner glaskopf*, Werner.—Brown iron-stone is distinguished from red iron-stone by

its red streak and inferior specific gravity: it also contains more water, the brown iron-stone being an hydrate. This ore, according to professor Jaffeon, makes but indifferent cast-iron, but affords good malleable iron and excellent steel. See IRON-ORE.

Compact Black Iron-stone; *Dichter schwarzeisenstein*. *Black hematite*; *Mine de fer noire compacte*, Fr.; *Schwarzer glaskopf*, Werner.—When melted with borax before the blow-pipe, it yields a violet-blue glass; hence it is conjectured to contain much manganese.

Sparry Iron-stone; *Chaux carbonatée ferrifère avec manganese*, Häuy.

Clay Iron-stone; *Fer oxydé massif*, Häuy; *Thoneisenstein*, Werner. See IRON-ORE, and *CLAY Iron-stone*, *Addenda*.

Reddle; *Argile ocreuse rouge graphique*, Häuy; *Roëthel*, Werner.

Columnar Clay Iron-stone; *Fer argilleux bacillaire*, Fr. *Lenticular Clay Iron-stone*; *Fer oxydé brun granuleux ou lenticulaire*, Fr. (See IRON-ORE.)—The following analyses of this ore is given by Daubuisson, *Journal des Mines*, 1810.

Peroxyd of iron	73
Water	14
Silex	9
Peroxyd of manganese	1
Lofs	3
	100

Jaspersy Clay Iron-stone. See IRON-ORE.
Reniform Clay Iron-stone; *Fer oxydé geodique*, Häuy.—The constituent parts of this ore are stated by Daubuisson.

Peroxyd of iron	76	78
Water	14	13
Silex	5	7
Oxyd of manganese	2	a trace
Alumine	0	1
	97	99

See IRON-ORE.

Pea-ore, or *Pisiform Iron-ore*; *Fer oxydé globuliforme*, Häuy; *Böhnerz*, Werner. See IRON-ORE.

Bog Iron-ore. See IRON-ORE, and *Bog Iron-ore*, *Addenda*.

Pitchy Iron-ore; *Fer oxydé résinite*.—The pitchy iron described under the article IRON-ORES appears to be a phosphate of iron; later mineralogists describe it as an oxyd and sulphate of iron. It is a rare ore, having been found only in one mine near Freyberg, and in the district of Pliffs in Upper Silesia. Its colour is greyish-black, passing into dark liver-brown. It is said to occur forming crusts. It has a splendent or shining resinous lustre. The fracture is imperfectly conchoidal: it is composed of granular distinct concretions: it is translucent on the edges: the streak is lemon-yellow: it is soft. When placed in water, it becomes semitransparent and vitreous. According to Klaproth, its constituent parts are,

Oxyd of iron	67
Sulphuric acid	8
Water	20
	95

Blue Iron-ore; *Blue Iron Earth*; *Fer phosphaté terreux*, Häuy.

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Häüy. (See IRON-ORE.) According to Klaproth, this ore contains,

Oxyd of iron - - -	47.50
Phosphoric acid - - -	32.0
Water - - -	20
	99.5

Chromate of Iron. See CHROME, and CHROMATE of Iron, *Addenda.*

Cube Ore. See ORES of Iron.

Muriate of Iron, Native, or Pyroslanite, Fer muriaté, Fr. has a liver-brown colour, inclining to pitaichio-green. It occurs crystallized in short six-sided prisms. The terminal planes of the crystals are shining and pearly, the lateral planes, when clear, are shining and vitreous. It has a foliated structure and four-fold cleavage, the most distinct of which is parallel with the terminal planes. It is translucent on the edges, and yields a brownish-white streak. Its specific gravity is 3.08. It is insoluble in water, but soluble in muriatic acid, except a small residuum of siliceous earth. Before the blow-pipe, it gives out copious fumes of oxy-muriatic acid. This is a very rare ore of iron.

The following table of the annual quantity of iron refined and melted in different parts of Europe, is extracted from the second edition of Jameson's Mineralogy, vol. ii. p. 314.

Quintals of 100 Pounds each.

Great Britain - - -	5,000,000
France - - -	4,500,000
Russia - - -	1,075,679
Sweden - - -	1,500,000
Austria - - -	1,010,400
Prussia, after the treaty of Tilsit	322,053
Kingdom of Westphalia in 1808	187,411
Spain - - -	180,000
Danish states - - -	135,000
Bavaria and the Tyrol - - -	110,000
Kingdom of Saxony - - -	80,000

The United States of America, without including Louisiana and the Indiana territory, are said to yield 480,000 quintals, and, according to Dr. Bruce, the value of the iron and manufactured articles of iron in the United States is from twelve to fifteen millions of dollars. The annual importation, including bar-iron and every article of iron or steel, is estimated at four millions.

IRIDIUM, an alloy of iridium with osmium. See OSMIUM, *Addenda.*

ISERINE. See TITANIUM.

JADE, *Jade-Nephrite, Fr.* See NEPHRITE, *Addenda.*

JASPER. (See JASPER.) In that article it is stated, that common jasper is exclusively found in veins: this is not strictly correct, for jasper occurs in irregular beds and masses in the argillaceous schistus, which covers the granite of the Grampian-hills in Kincardineshire. Jasper occurs in some of the beds of manganese near Exeter.

JENITE. See YENITE.

JET *Pitch-coal, Jayet, Fr.*, has a black colour, and yields a brownish-black streak. It occurs massive, and in the shape of branches. Jet has a ligneous structure. The fracture is large and perfect conchoidal, with a shining resinous lustre. It becomes electric by friction, and burns with a greenish flame and bituminous odour. Jet, according to the experiments of Dr. Macculloch, contains vegetable extract **oa**

distillation; but when heated under compression, it is converted into true mineral coal. For some account of the localities of jet, see JET.

KAOLIN. See PORCELAIN *Earth, Addenda.*

KYANITE, or *Cyanite; Disthéné, Häüy; Sappare, Sauffure.* Its colours are blueish, or grey sky-blue, and pale blueish-green. The white varieties are partially shaded with blue. It occurs crystallized and massive. The form of the crystals are an oblique four-sided prism, with two opposite broad, and two opposite narrow planes. This is the primitive crystal. It occurs also truncated on the two opposite acute lateral edges, forming an hexahedral prism; sometimes all the lateral edges are truncated; and sometimes two prisms are joined by their broader lateral planes, forming a twin crystal. The narrow lateral planes are longitudinally streaked. The lustre is shining and pearly, and that of the broad planes is sometimes splendid. Kyanite has a lamellar structure, with a cleavage parallel to the planes of an oblique tetrahedral prism; that parallel with the broad lateral planes is the most distinct. The structure of amorphous kyanite is more or less curvately lamellar, passing into bladed. It is translucent or transparent; it scratches glass, and is easily frangible. The specific gravity is 3.47 to 3.51. Some of the crystals become positively electric, others negative; hence the name disthene was given to it by Häüy, on account of its double electrical powers. It is infusible before the blow-pipe. According to Klaproth, its constituent parts are,

Alumine - - -	55.5
Silex - - -	43
Oxyd of iron - - -	0.5
	99.0

According to Langier,

Alumine - - -	55.30
Silex - - -	38.50
Lime - - -	0.50
Oxyd of iron - - -	2.75
	97.05

It occurs in primitive mountains, in mica-slate, talc-slate, and white-stone. It has been found at Boharn, in Bamfshire, and Bamhory, Aberdeenshire. In India it is cut and polished, and sold as an inferior kind of sapphire. Sometimes crystals of kyanite may be seen joined and intermixed with grenolite, (see GRENOLITE,) which shews the near alliance of these minerals, which have also nearly the same chemical composition.

LABRADOR *Felspar.* See FELSPEAR.

LABRADOR *Hornblende.* See HYPERSTENE, *Addenda.*

LAPIS-LAZULI. See LAZULI.

LATIALITE. See HAÜYNE, *Addenda.*

LAUMONITE. See ZEOLITE.

LAZMESTONE. See LAZULI.

LAZULITE. See LAZULITE.

LEAD-ORES. (See LEAD, where eleven species of lead-ore are described.) The antimonial lead-ore is called the triple sulphuret of lead. Four other species of lead-ores have since been described; cobaltic lead-ore, native minium, arseniate of lead, and muriate of lead.

Cobaltic Lead-ore has a fresh lead-grey colour, and a shining metallic lustre. It occurs minutely disseminated, and

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and in extremely minute crystals, aggregated like mofs; it is opaque, soft, and sectile. Before the blow-pipe it splits into small pieces, and communicates a small blue colour to borax.

Native Minium; Plomb oxyd  rouge, Haüy.—It has a scarlet-red colour. It occurs massive and pulverulent; when examined with a lens, it exhibits a crystalline structure, like galena, in which it is generally found. Before the blow-pipe, on charcoal it is first converted into litharge, and then into metallic lead. This mineral is probably produced by the decomposition of galena, which it incrusts. It has been found at Grassington, and other parts of Craven, in Yorkshire.

Muriate of Lead, or Corneous Lead-Ore.—Its colours are greyish or yellowish-white, passing into wine-yellow. It occurs crystallized in cuboidal prisms, either simple, or terminated by tetrahedral pyramids, or bevelled on the edges. It exhibits a lamellar structure, with joints in three directions parallel to the faces of a cuboidal prism; the cross fracture is conchoidal; it has a splendid adamantine lustre; is more or less transparent. It is very soft and frangible. On exposure to the blow-pipe, on charcoal it melts into an orange-coloured globule, and appears reticular externally, and of a white colour when solid; if melted again, it becomes white; and on increase of the heat the acid flies off, and minute globules of lead remain. According to Klaproth, its constituent parts are,

Oxyd of lead	85.5
Muriatic acid	8.5
Carbonic acid and water	6
	100

Arseniate of Lead, or Reniform Arseniate of Lead; Plomb arseni  compacte, Haüy.—Its colours in the fresh fracture are reddish-brown and brownish-red; externally ochre-yellow and straw-yellow; internally the lustre is shining and resinous; the fracture is conchoidal, inclining to uneven; it is opaque, soft, and brittle. The specific gravity is 3.93. This ore has hitherto been found only in one mine near Nertchinsk, in Siberia. It occurs in reniform and tuberos masses; it is insoluble in water. Before the blow-pipe, on charcoal it gives out arsenical vapours, and is more or less perfectly reduced. Its constituent parts are,

Oxyd of lead	35
Arsenic acid	25
Water	10
Oxyd of iron	14
Silver	2.5
Silex	7
Alumine	2
	95.5

Filamentous Arseniate of Lead, Plomb arseni  filamenteux, Haüy, occurs crystallized in small acicular prisms, or in delicate silky filaments, at St. Foix, in the department of Sa ne and Loire, in France.

Earthy Arseniate of Lead occurs in crusts, in the same mine with the filamentous. Its colour is yellow; it has an earthy fracture; is soft and friable. This ore has also been found associated with white lead-ore, copper-ores, and quartz, in the hill of Horpice, in Oisans.

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Indurated Earthy Lead-Ore, Plomb carbonat  teneux, Fr. described as lead-earth under the article LEAD-ORES, has been analysed by John. Its constituent parts are,

Oxyd of lead	66
Carbonic acid	12
Water	2.25
Silex	10.50
Alumine	4.75
Iron and oxyd of manganese	2.25
	97.75

This ore occurs in considerable quantities in some of the mines in Craven, in Yorkshire, and is smelted as a rich ore of lead.

Conchoidal Phosphate of Lead contains a small portion of arsenic and muriatic acid. It differs from green lead-ore, described under the article LEAD-ORE. When crystallized, the planes of the crystals are generally convex. It occurs also stalactitic, reniform, and botryoidal. The colour is orange-yellow, passing into lemon-yellow and red; the fracture is conchoidal; it is translucent; internally the lustre is shining and resinous. Its specific gravity is 7.26. According to Langier, its constituent parts are,

Oxyd of lead	76.8
Phosphoric acid	9
Arsenic acid	4
Muriatic acid	7
Water	1.5
	98.3

According to Rose,

Oxyd of lead	77.5
Phosphoric acid	7.5
Arsenic acid	12.5
Muriatic acid	1.5
	99

This ore has been found in Huel Unity mine, Cornwall.

The greatest quantity of lead is raised in England of any country in Europe. The following table contains the annual amount of lead in quintals from the following countries:

	Lead in Quintals.
Great Britain	250,000
France	60,000
Westphalia in 1809	59,771
Austrian dominions	45,809
Spain	32,000
Prussia, after the treaty of Tilsit	12,992
Saxony in 1808	10,000
Russia	10,000
Bavaria and the Tyrol	400
	480,972

LEELITE, a mineral very recently discovered at Gryphyl, in Sweden, of which we have only the following description. It has a red colour, the lustre and transparency

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parency of horn, and the hardness of flint. The specific gravity is 2.71. Its constituent parts are,

Silice	-	-	-	75
Alumine	-	-	-	22
Manganese	-	-	-	2.50
Water	-	-	-	.50
				100

LEPIDOLITE. (See **LEPIDOLITE**.) When that article was written, it was supposed that this mineral was exclusively found on Mount Hradisko, in Moravia. Lepidolite has since been discovered in Saxony, Sweden, Norway, France, the Island of Elba, and in several parts of Scotland, particularly in lime-stone, near Dalmally, in a slate-quarry at Ballachulish, at the head of Loch Fyne, and at Glentil in Perthshire.

LEUCITE, Amphigene, Häuy. See **LEUCITE**.

LIECITE, or Yenite. See **YENITE**.

LIME-STONE. See **LIME-STONE** and **GEOLOGY, Addenda.**

LITHOMARGE, Friable. (See **LITHOMARGE**.) This variety is characterized by its fealy particles foiling, and low degree of coherence. According to Klaproth, it contains

Silice	-	-	-	32.
Alumine	-	-	-	26.50
Iron	-	-	-	21.
Muriate of soda	-	-	-	1.50
Water	-	-	-	17.
				98

LITHOMARGE, Indurated; Argil lithomarge, Häuy. (See **LITHOMARGE**.) This variety occurs in veins in porphyry, gneiss, grey wacke, and serpentine, and in drusy cavities in basaltic rocks. It is intermediate between steatite and variegated clay, and appears sometimes to pass into meerschaum.

LYDIAN-Stone. See **FLINTY Slate**, and **HORN-STONE, Addenda.**

LYTHRODES, a mineral discovered in Norway, which appears allied to eololite, and was called lythodes by Karsten, because when first broken it appears as if spotted with coagulated blood. Its colour is aurora-red, passing into brownish-red or brown; it is occasionally marked with cream-yellow and greenish spots. It occurs massive and disseminated; it has an imperfect foliated structure. The lustre of the surface is resinous and glimmering. The cross fracture is splintery and dull: it is feebly translucent on the edges; it is hard. The specific gravity is 2.5. According to John, the constituent parts are,

Silice	-	-	-	44.62
Alumine	-	-	-	37.36
Lime	-	-	-	2.75
Soda	-	-	-	8.00
Water	-	-	-	6.
Oxyd of iron	-	-	-	1.
				99.73

MACLE, a name given by the French mineralogists to chialtolite or *Hollovo spar*; which see.

MADREPOSITE, a variety of black lime-stone, so called on account of its occurring in radiated or diverging prismatic concretions, which are supposed to resemble the stars of madreporas: it has a minute and indistinctly curvedly lamellar structure. When rubbed, it emits a strong smell of

fulphuretted hydrogen gas. Patron suspects that this mineral is faciliated arragonite. According to Klaproth, it consists of

Carbonate of lime	-	-	93.
Carbonate of magnesia	-	-	0.50
Carbonate of iron	-	-	1.25
Carbon	-	-	0.50
Siliceous sand	-	-	4.50
			99.75

Other analyses give a small portion of sulphur and manganese.

MAGNESIAN Lime-stone, or Compact Dolomite, has generally a yellowish-brown or yellowish-grey colour, a granular structure, a glimmering or glitening lustre, and dissolves slowly in acids; these characters distinguish it from common lime-stone. The specific gravity is about 2.8. It contains fewer petrifications than most common lime-stones. It occurs in regular strata on the eastern side of England from Nottinghamshire to Sunderland. It occurs also in amorphous masses, and variously contorted beds, and also forming a kind of lime-stone breccia in the red marle. According to Tennant, its constituent parts are,

Yorkshire.			
Lime	-	-	30
Magnesia	-	-	20
Carbonic acid	-	-	47
Alumine	-	-	1
			98

According to Thomson,

Near Sunderland.			
Carbonate of lime	-	-	56.80
Carbonate of magnesia	-	-	40.84
Carbonate of iron	-	-	0.36
Insoluble matter	-	-	2.
			100

MAGNESITE, Magnesia carbonatée, Häuy. It occurs in amorphous masses and tuberos spongiform. The fracture is splintery and large, and flat conchoidal. It is opaque, earthy. The colour is yellowish-grey or white, with spots and dendritic delineations of blackish-brown. Magnesite yields to the nail externally, but internally it is harder than calcareous spar; it feels somewhat meagre, adheres to the tongue, and absorbs from nine to ten *per cent.* of water when immersed in it, and becomes semi-transparent on the edges. It is slowly soluble with effervescence in concentrated muriatic acid. Before the blow-pipe it is infusible, but becomes sufficiently hard to scratch glass. Its specific gravity is 2.88. According to Bucholz, the constituent parts are,

Magnesia	-	-	45.52	to	48
Carbonic acid	-	-	47.00	to	52
Silice	-	-	4.50		
Alumine	-	-	0.50	a trace	
Manganese	-	-	0.50	a trace	
Lime	-	-	0.08	a trace	
Water	-	-	2.		
			100.10	100	

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It is found in serpentine in Moravia, along with meersch-
 chaum and earthy talc. It is distinguished from meersch-
 chaum by its colour, external shape, fracture, meagre feel, and
 weight.

MAGNETIC Iron-Stone, and *Magnetic Pyrites*. See **IRON-
 Stone**, and **PYRITES**.

MALACHITE. See **COPPER-Ores**.

MANGANESE-Ores. See **MANGANESE** and **WADD**.

MARL. See **MARLE**.

MEERSCHAUM. (See **MEERSCHAUM**.) This mineral, of
 which an account is given under the article, appears to be
 hydrate of magnesia combined with flint; it is flated by
 Mr. Jamefon to be fusible on the edges into a white enamel.
 It occurs in veins in the serpentine of Cornwall. In
 Natolia it occurs in beds under the soil, and from 600 to
 700 men are employed in digging it. When first raised, it
 is soft and greasy, and lathers with water like soap; hence
 it is used by the Tartars for washing. Meerfchaum is
 extensively manufactured in Turkey into tobacco-pipes,
 which are boiled in oil or wax; afterwards they are baked, and
 then polished.

MEIONITE. See **MEIONITE**.

MELANITE, *Grenat noire*, Häuy. See **GARNET**.

MELLITE and **MELLILITE**, *Honey-Stone*. See **MELLITE**.

MENACHANITE. See **TITANIUM**.

MENILITE, *Quartz resinite subluifante brunatre*, Häuy.
 See **MENILITE**.

MERCURY-Ores. See **MERCURY**, and **CINNABAR**,
Addenda.

MESOTYPE. See **ZEOLITE**.

METEORIC Native Iron; *Fer natif meteorique*, Häuy.
 The colour is pale steel-grey, which inclines to silver-white,
 like platina; it is generally covered with a thin brown crust
 of oxyd of iron; it occurs in racemose or globular masses,
 and also minutely diffeminated in meteoric stones. (See
STONE, *Meteorice*.) The external surface is smooth and
 glimmering; the internal glimmering or glitening with a
 metallic lustre: it yields a splendent streak, and is malleable
 and flexible, but not elastic. The specific gravity of
 meteoric iron is from 6.48 to 7.57; it is magnetic. Accord-
 ing to Mr. Howard, the constituent parts are,

Iron	-	-	-	-	96.5	-	-	-	96.75
Nickel	-	-	-	-	3.5	-	-	-	3.25

All the meteoric iron which has yet been examined
 contains a portion of nickel; the latter metal is also found in
 most of the meteoric stones. The phenomena attending the
 descent of meteoric iron are precisely similar to those which
 accompany the fall of meteoric stones. In most instances,
 loud detonations and brilliant light or fire-balls have pre-
 ceded the fall. These fire-balls appear to be the metallic
 or mineral matter in a state of vivid ignition. Pliny men-
 tions the fall of a mass of spongy iron from the atmosphere
 in Lucania fifty-six years before the Christian era. Avicenna
 mentions a mass of iron weighing fifty pounds,
 which fell from the air near Lurgea; and Averrhoes says,
 a mass of iron weighing one hundred pounds fell at Cordova
 in Spain. In the year 1164, a shower of iron fell in
 Misfina. (Georg. Fabri. Rer. Misfina, lib. i. p. 32.) In
 the year 1552 fire-stone or masses of iron fell near Mifkos,
 in Transylvania. And among numerous other instances in
 the year 1751, a fire-ball burst with a loud explosion in
 the bishopric of Agram, in Croatia: two masses of iron fell
 from it; the one, which weighed seventy-two pounds, sunk a
 considerable depth into the earth; and the other, which was
 sixteen pounds, fell on the surface of a meadow, at the dif-

tance of 2000 paces from the former; the larger is still pre-
 served in the Imperial cabinet of Vienna.

Numerous masses of native iron occur in various parts of
 the world, which agree in external appearance and chemical
 composition with those whose descent from the air is well
 attested. Professor Pallas discovered a mass of native iron,
 weighing about 1600 pounds, on the surface of a hill
 between Krasnojark and Abakunsk, in Siberia. It is con-
 sidered as a holy relic by the natives, who believe that it fell
 from heaven.

Several masses of native iron have been met with in
 Mexico; and many years since, a mass of native iron, cal-
 culated to weigh about thirty tons, was discovered in the
 district of St. Jago de Eitro, in South America. It lies in
 the middle of a great plain, where no rock or mountain is
 within an hundred miles of it. According to Howard, it
 consists of 90 parts of iron, and 10 of nickel. Similar
 masses have been found in Africa, North America, and the
 East Indies.

MICA. See **MICA**.

MIEMITE, *Granular*, is a variety of magnesian lime-stone,
 first found at Miemo in Tuscany: it has a light green or
 greenish-white colour; it occurs massive and crystallized,
 in small flat double three-sided pyramids, in which the lateral
 planes of one pyramid are set on the lateral edges of the
 other; the crystals are often joined by the edges, or intersect
 each other. It is translucent, and has internally a splendent
 and pearly lustre. The structure is curvately lamellar. Its
 specific gravity is 2.88; it dissolves slowly in acids. The
 constituent parts are,

Carbonate of lime	-	-	-	53
Carbonate of magnesia	-	-	-	42
Carbonate of iron and manganese	-	-	-	3
				98

Prismatic Miemite occurs in low, small, three-sided
 pyramids, deeply truncated on the edges; it appears to
 contain less magnesia than the preceding.

MILK Quartz, or *Rose Quartz*. See **QUARTZ**.

MINERAL Caoutchouc, or *Elastic Bitumen*. (See **BITU-
 MEN**.) This singular mineral has been hitherto only found
 in the Odin mine, near Cattleton in Derbyshire. According
 to the analysis of Klaproth, it contains in 100 grains,

	Cubic Inches.
Carbonated hydrogen	38
Carbonic acid	4
	Grains.
Bituminous oil	73
Acid water	1.50
Carbon	6.23
Lime	1.50
Silex	.75
Sulphate of lime	.50
Alumine	.25

MINERAL Oil. See **PETROLEUM**.

MINERAL Pitch, *Earthy*, or *Maltha*. See **BITUMEN**.

MINERAL Pitch, *Slaggy*, or *Asphaltum*. See **BITUMEN**.

MISPICEL, *Arsenical Pyrites*. See **ARSENIC**, and **PY-
 RITES**.

MOLYBDENA, or *Sulphuret of Molybdena*; *Molybdene sul-
 phurée*, Häuy; is of a bright lead-grey colour. It occurs
 massive, disseminated in plates, and crystallized. The form of
 the crystals is a regular six-sided table, or a very short six-
 sided

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sided prism, terminated by two low six-sided pyramids. The lustre is metallic and shining. The structure is lamellar, with a single cleavage parallel with the lateral planes of the table. It is brittle and somewhat flexible, but not elastic. Molybdena is unctuous to the touch, and leaves a mark on paper like plumbago, but on white porcelain it makes a greenish mark. Its specific gravity is from 4.5 to 4.7. Before the blow-pipe it gives out a sulphureous odour, and when urged by the utmost force, it yields a white vapour, and a pale blue flame; in carbonate of foda, it is soluble with violent effervescence. The characters here given, particularly its mark on china, serve to distinguish molybdena from graphite and plumbago. (See MOLYBDENUM, and SULPHUR.) According to Bucholz, its constituent parts are,

Molybdenum	-	-	60
Sulphur	•	-	40
			100

This mineral occurs in some parts of Scotland, and in granite at Coldbeck-fell in Cumberland. It is found also at Huel-Gorland, Cornwall.

MOLYBDENA Ochre is a yellow colour, passing into yellowish-green; it is friable and dull, and occurs incrusting molybdena, on which it is doubtless formed by the decomposition of the latter mineral.

MOON-STONE, a variety of adularia. See ADULARIA, and FELSPAR.

MORASS-Ore. See BOG Iron-Ore.

MOUNTAIN Cork, or Mountain Leather; Asbeste treffe, Häüy. It is sometimes called mountain flesh and mountain pader. It occurs in thin flexible plates like leather, or in thicker and less flexible pieces like cork-wood. The colours are yellowish and greyish-white; it yields to the nail, is meagre to the touch, and so light as to swim on water. The structure is finely and promiscuously fibrous. According to Bergmann, its constituent parts are,

Silix	-	-	56.2
Magnesia	-	-	26.1
Alumine	-	-	2
Lime	-	-	12.7
Oxyd of iron	-	-	3
			100

MOUNTAIN, or Rock Wood, or Ligniform Asbestos; Asbeste ligniforme, Häüy; has a wood-brown colour, and a curved and fibrous structure resembling wood. It is soft, opaque, and brittle; it is slightly flexible; it feels meagre. According to Jamefon, it is infusible; it is classed by him in the talc family.

MULLER Glafs. See HYALITE.

MURIATE of Ammonia, Native, is a frequent product of volcanoes. See AMMONIA.

MURIATE of Copper. See COPPER-Ores.

MURIATE of Lead, or Corneous Lead-Ore. See LEAD-Ore.

MURIATE of Soda. See ROCK-SALT and SALT.

MUSCOVY Glafs, the large plates of mica, which are generally brought from Siberia. (See MICA.) These plates are erroneously called talc.

MUSSITE, a variety of DIOPSIDE; which see.

NAPHTHA, Bitume liquide blanche, Häüy. See BITUMEN.

NATROLITE. See NATROLITE, and ZEOLITE.

NATRON, Soude carbonatée, Fr. Native carbonate of foda is deposited on the sides of lakes, or on the surface of the ground, and generally containing muriate and sulphate of foda. See SODA.

Radiated Natron, Soude carbonatée aciculaire, Fr. occurs in Africa, and forms a considerable article of commerce. This variety is nearly pure carbonate of foda, containing, according to Klaproth,

Water of crystallization	-	-	22.50
Carbonic acid	-	-	38
Pure foda	-	-	37
Sulphate of foda	-	-	2.50
			100

NEPHELINE, or Sommitte. (See SOMMITE.) This mineral occurs in the lava of Vefuvius, and bears a near resemblance to MEIONITE (which see). Nepheline is crystallized in six-sided prisms or tables, but the crystals of meionite are four-sided prisms. The latter mineral is easily fusible, but nepheline melts with difficulty. Nepheline has a four-fold cleavage, three of which are parallel with the lateral planes, and one to the terminal planes of the prism. Transparent pieces of nepheline become cloudy in nitric acid; it was named by Häüy from the Greek word νεφέλη, a cloud.

NEPHRITE, or Jade; Jade nephritique, Häüy. The colour is leek-green, passing to greyish-green; it occurs massive. The fracture is uneven and splintery, with a glimmering and somewhat greasy lustre; it is translucent. Nephrite yields to the knife, but scratches glafs; it has a greasy feel, is very tough. The specific gravity is from 2.9 to 3. Before the blow-pipe, it melts into a white enamel. According to Käftner, its constituent parts are,

Silix	-	-	50
Alumine	-	-	10
Magnesia	-	-	31
Iron	-	-	5.50
Chrome	-	-	0.05
Water	-	-	2.75
			99.30

Nephrite occurs in granite veins in the Hartz in Saxony; the most beautiful varieties are from Persia and Egypt. In Turkey it is cut into handles for sabres and daggers. It was formerly believed that this stone had the property of relieving nephritic complaints; hence it has been called nephritic stone. A slaty kind of nephrite is used by the inhabitants of New Zealand for hatchets, and hence has been called axe-stone. Nephrite is nearly allied to serpentine and steatite; there is also a kind of nephrite which is more nearly allied to felspar, and is classed by Mr. Jamefon with the felspar family; it is called saussurite, after the celebrated geologist Saussure, by whom it was first discovered. See SAUSSURITE, *Addenda*.

NICKEL-Ores are, native nickel, copper nickel, and nickel ochre.

Native Nickel has only been found hitherto in the Adolphus mine at Johanngeorgenstadt in Saxony, and at Joachimthal in Bohemia. Its colour is bronze-yellow, but is frequently tarnished greenish-grey, or steel or lead-grey, and occasionally invested with a crust of brown iron-stone. It occurs in capillary crystals, which are either promiscuously or scopiformly aggregated. Internally the lustre is splendid and metallic, externally shining or splendid when untarnished.

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untarnished. The cross fracture is even passing into flat conchoidal; it is easily frangible, and rather hard; it is more or less flexible and elastic. Before the blow-pipe, on charcoal it melts into a metallic globule, without any smell of arsenic or sulphur, which serves to distinguish it from capillary pyrites. Native nickel contains the metal nickel with a minute portion of cobalt. See NICKEL.

Copper Nickel, Nickel arsenical, Haiüy, has a copper or crimson colour, of different degrees of intensity, and often tarnished grey or black. It occurs massive and disseminated, and sometimes reticulated, botryoidal, or dendritical, and very rarely crystallized in six-sided tables; it has a shining metallic lustre. The fracture is imperfectly conchoidal, passing into granular and uneven. It is usually compact, but sometimes occurs in granular distinct concretions. It yields with difficulty to the knife, and is difficultly frangible. Its specific gravity is from 6.6 to 7.5. Before the blow-pipe it gives out an arsenical vapour, and then fuses with difficulty into a dark scoria, mixed with metallic grains: it is soluble in nitromuriatic acid, forming a dark green liquor, from which caustic alkali throws down a pale green precipitate, which distinguishes it from copper; the precipitate of the latter is a dark brown. This ore is a compound of nickel and arsenic; it occurs in small quantities in the lead-mines of Lead-hills and Wanlockhead, in Scotland, and in various parts of the continent of Europe, generally in veins in primitive mountains: it nearly resembles native copper, but may be distinguished by its brittleness.

Black Nickel-Ore has a greyish or brownish-black colour; it occurs massive, disseminated, and in cruts; it is dull, has an earthy fracture, but becomes resinous and shining in the streak; it soils slightly. In nitric acid it forms an apple-green solution, which lets fall a precipitate of white arsenic. It is rather a rare mineral, and is found in veins with other ores of nickel, and is supposed to be formed by the decomposition of copper nickel.

Nickel Ochre, Nickel oxyd, Haiüy, has an apple-green colour, but on exposure to the air becomes greenish-white: it is generally found as a thin coat or crust, and seldom massive or disseminated; it is in loose powder or friable, meagre to the touch, and light. It is infusible before the blow-pipe, but with borax it forms a red colour; in cold nitric acid it remains insoluble. This ore occurs at Lead-hills and Wanlockhead, in Scotland, and in Saxony and France.

NIGRINE. See TITANIUM.

NITRE, Native, Potasse nitraté, Fr. occurs in flakes, cruts, and capillary crystals on the surface of the ground. In many countries, it appears to form at certain seasons of the year. It abounds in many of the plains of Spain, Hungary, the Ukraine and Podalia, and on the walls and floors of chalk caves in France. It is very abundant in India, Egypt, and in some parts of North and South America. See POTASH, Nitrate of.

OBSIDIAN, or Volcanic Glass; Lava vitreuse obsidienne, Haiüy. (See OBSIDIANUS LAPIS.) This mineral bears so close a resemblance to dark-green bottle-glass as scarcely to be distinguished from it. Its most common colours are dark-grey or greenish, or brownish-black; it has a vitreous and shining or splendid lustre; the fracture is large and perfectly conchoidal. It passes from transparent to nearly opaque, according to the intensity of the colour; it scratches glass, but is easily frangible. The specific gravity varies from 2.34 to 2.38. The black obsidian of Iceland is said to melt into a pale ash-grey vitreous glass on charcoal; that of Spanish America lost its black colour when exposed to heat, became white, spongy, and fibrous, and increased to seven or eight times its original bulk; hence it appears that some

gaseous substance escapes. Humboldt conjectures, that the gas evolved during the volcanic fusion of obsidian in the interior of the earth, may give rise to the earthquakes that agitate the Cordilleras. According to Abilgaard, the constituent parts of obsidian are given as under:

Obsidian of Iceland.

Silic	-	-	-	-	74
Alumine	-	-	-	-	2
Oxyd of iron	-	-	-	-	14
Loss, supposed to be potash or soda	-	-	-	-	10
					100

According to Collet Deseotils,

America.

Silic	-	-	-	-	72.0
Alumine	-	-	-	-	12.5
Manganese	-	-	-	-	2.0
Potash and soda	-	-	-	-	10.0
					96.5

Some analyses give 1.6 lime, and only 5 of potash and soda.

Obsidian is found in a great many volcanic countries, and also in various parts of the world, where no volcanic fires have existed since the history of man. For a long period it was contended by Werner and his followers, that this mineral was of aqueous origin, but the appearance of obsidian, and the situations in which it occurs, offer decisive proofs of its formation by fire. The mountain de la Castagna, in Lipari, according to Spallanzani, is wholly composed of it, which appears to have flowed in successive currents, like streams of water falling with a rapid descent and suddenly frozen. The obsidian is sometimes compact and sometimes porous and spongy. On the fourth side of the Peak of Tenerife, there is a stream of obsidian several miles in length. In the island of Feliceuda, a current of lava intermixed with obsidian may be traced to the very crater of a volcano. Obsidian appears to be lava suddenly cooled, as it is well known, since the experiments of Mr. Keir, Mr. Watt, and Sir James Hall, that lava or basalt cooled suddenly forms black glass; and we have a specimen of lava from Vefusivus, which flowed in the year 1818, one part of which is compact black lava, the other is a vitreous substance passing from pitch-stone to obsidian. See VOLCANIC PRODUCTIONS.

OCTAEDRITE, Anatase. See TITANIUM.

OLIVINE. (See OLIVINE.) This mineral forms a constituent part of many lavas, and is of frequent occurrence in basaltic rocks. When crystallized, it is in broad rectangular four-sided prisms, which are imbedded, and so easily broken, that it is difficult to ascertain their form; the fracture of the crystals is imperfectly lamellar, in a direction parallel with the planes of the prism. Werner considers olivine as a distinct species from chrysolite (see CHRYSOLITE), with which it is classed by many mineralogists. The colour, lustre, and fracture of olivine and chrysolite, are not precisely the same; olivine is also softer and more frangible than chrysolite. Chrysolite is more transparent, and has a greater specific gravity, being from 3.4 to 3.34; that of olivine is 3.22 to 3.26. Olivine is often much intermixed with augit; it has generally a paler colour and greater transparency than the latter mineral. Olivine is subject to decomposition, and when this commences it exhibits on the surface iridescent colours, but afterwards falls into an earth resembling iron ochre.

OLIVEN-

MINERALOGY.

OLIVEN-ORE, or *Olive Copper-Ore*, arseniate of copper. See **COPPER-ORES**.

ONYX, a variety of chalcedony with white and grey stripes. See **CHALCEDONY**.

OPAL, *Quarz refinite opalin*, Haüy. (See **GEM.**) This mineral is divided into seven sub-species by Mr. Jamefon.

Precious Opal has frequently a milk-white colour inclining to blue, and difplays brilliant and changeable reflections of green, blue, yellow, and red. It is tranflucient or femi-transparent, and when placed between the eye and the light exhibits a beautiful yellow or blue colour. It occurs in veins in clay-porphry, either mafive, diffeminated, or in plates; it has a fhining or fplendent vitreous luftre, a perfect conchoidal fracture, fcratches glafs, and is eafily frangible. Some varieties adhere to the tongue. Precious opal becomes white and opaque before the blow-pipe, but is infufible. The fpecific gravity is 2.110. According to Klaproth, the conflituent parts are,

Silix	-	-	-	-	90
Water	-	-	-	-	10
					100
					100

Hence it appears, that the precious opal is properly a hydrate of pure filiceous earth. This mineral, on account of its beauty, is employed in jewellery, and is held in great eftimation. Jewels of opal mult be kept with care, as they are eafily fcratched, and are apt to crack on fudden changes of temperature. Precious opal is found more abundantly at Cafchervenitzza, near Kafchau, in Upper Hungary, than in any other known fituation. It occurs there in clay-porphry, and mines of it have been worked for a long period; towards the end of the fourteenth century, about 300 men were employed in thefe mines. Precious opal is fometimes fparingly found in the bafaltic rocks, in the north of Ireland, and in the Faroe iflands. The finer varieties of opal are named oriental opal. Taverner, however, informs us, that no precious opal is found in the eaft, and thofe which are fold as oriental are brought from Hungary. Thofe varieties of opal that adhere to the tongue are lefs tranflucient than the others, and more dull; but when immerfed in water, they become nearly transparent, and acquire a beautiful play of colours. Thefe opals have received various names, as the oculus mundi, hydrophane or changeable opal. They are much prized by collectors. To preferve their beauty, the water in which they are immerfed fould be perfectly pure, and they fould be taken out as foon as they have acquired their full transparency. If thefe precautions are neglected, the pores become filled with earthy particles depofited from the water, and the hydrophane will remain more or lefs opaque.

Common Opal differs from precious opal, principally by its inferior luftre and transparency, and the greater variety of its colours, which are either milk-white, grey, yellowifh-white, yellow, red, or green. The fame fpecimen never fhews more than one colour by reflected light, but the milk-white variety, when held oppofite the light, tranfmits a wine-yellow colour. Common opal occurs mafive, diffeminated, and in fharp angular pieces. Internally the luftre is fhining, fplendent, and vitreous; the fracture is conchoidal; it fcratches glafs, and is eafily frangible. Before the blow-pipe it is infufible. The fpecific gravity is 2.01 to 2.14. According to Klaproth, its conflituent parts are,

	Opal of Koremutz.		of Telkobayna.
Silix	-	98.75	-
Alumine	-	10	-
Oxyd of Iron	-	10	-
Water	-	-	5
		98.95	99.50

Common opal occurs in veins of porphyry and ferpentite, and with chalcedony in bafaltic amygdaloid; it is found in fome metallic veins in Cornwall. Green common opal is fometimes cut into ring-ftones. The yellow variety is alfo ufed for jewellery; it has been called *wax opal* and *pitch opal*.

Fire Opal, fo called on account of its brilliant red colours and transparency, is properly a variety of precious opal: it has hitherto been found only at Zimapan in Mexico. According to Klaproth, its conflituent parts are,

Silix	-	-	-	92.	
Water	-	-	-	7.75	
Iron	-	-	-	25	
					100

Mother-of-Pearl Opal, or *Cacholong*, is a milk-white variety of opal, not unlike mother-of-pearl.

Semi-opal.—Its colours are generally darker and more muddy than thofe of common opal; fometimes feveral colours occur together. Semi-opal is mafive, diffeminated, reniform, and botryoidal; it has a gliftening luftre, is more or lefs tranflucient, is hard and eafily frangible. The fracture is large and flat, is conchoidal; it adheres to the tongue. The fpecific gravity is from 2. to 2.18; it is infufible. According to Klaproth, the conflituent parts are,

Silix	-	-	-	81	
Alumine	-	-	-	3	
Oxyd of iron	-	-	-	1.75	
Carbon	-	-	-	5	
Ammoniacal waters	-	-	-	8	
Bituminous oil	-	-	-	0.33	
					99.08

Semi-opal occurs in Scotland and the ifle of Rum, and in various parts of Europe: it paffes into chalcedony and conchoidal horn-ftone.

Wood Opal, *Quarz refinite xyloide*, Fr. is petrified wood, penetrated with opal, and is intermediate between common opal and femi-opal. It has a ligneous ftructure, and is diftinguifhed from wood-ftone by its lighter colours, higher luftre, perfect conchoidal fracture, greater transparency, and inferior hardnefs. Wood-opal is cut into plates, and ufed for fnuif-boxes and ornaments.

Jafper Opal is of various fhades of reddifh-yellow or reddifh-brown; it is fometimes veined and fotted; it has a fhining luftre, between vitreous and refinous, and is opaque or feebly tranflucient at the edges. It is hard, and eafily frangible; it occurs mafive in large and fmall pieces, in porphyry and in veins. The fpecific gravity is from 1.86 to 2.07; it is infufible. According to Klaproth, the conflituent parts are,

Silix	-	-	-	43.5	
Oxyd of Iron	-	-	-	47	
Water	-	-	-	7.5	
					98

MINERALOGY.

It appears to be common or semi-opal rendered opaque by the great intermixture of oxyd of iron.

ORIENTAL Amethyst, Sapphire, Ruby, Topaz, and Emerald, names given by jewellers to varieties of the sapphire. The blue sapphire is the true or *oriental sapphire*; the violet-blue is the *oriental amethyst*; the red sapphire, the *oriental ruby*; the yellow sapphire, the *oriental topaz*; and the green sapphire, the *oriental emerald*. See SAPPHIRE, &c.

ORPIMENT, Red, or Realgar, Sulphuret of Arsenic; Arsenic sulphurée rouge, Fr. (See ARSENIC.) According to Klaproth, the composition of this ore is,

Arsenic	-	-	69
Sulphur	-	-	31
			100

ORPIMENT, Yellow, is composed, according to Klaproth, of

Arsenic	-	-	62
Sulphur	-	-	38
			100

OSMIUM occurs as a native alloy of the metal so called with iridium; it is found in grains along with platina in alluvial soil in South America. The greens have a pale steel-grey colour, a metallic lustre, and lamellar fracture; it is harder than platina, and brittle. The specific gravity is 19.5. By fusion with nitre, it acquires a dark-black colour, but regains its lustre and colour by heating with charcoal.

PALLADIUM is a native alloy of the metal palladium, with a minute portion of platina and iridium; it occurs in grains along with grains of platina in the alluvial gold districts in Brazil. Its colour is pale-steel grey passing into silver-white; the fracture of the grains is divergingly fibrous, the lustre metallic. The specific gravity is 12.148. Lowry. Palladium is infusible; but on the addition of sulphur, it melts with ease by continuance of the heat, the sulphur is dissipated, and a globule of metallic palladium remains. With nitric acid, it forms a deep-red solution.

PARANTHINE. See SCAPOLITE.

PEARL-SPAR. (See BROWN SPAR, *Addenda*.) The name pearl-spar has been given to those varieties of this mineral which in colour and lustre have a strong resemblance to pearl, but it often occurs brown, black, and of various colours.

PEARL-STONE, *Lave vitreuse perlée*, Haüy. (See PEARL-STONE.) This mineral is regarded by many mineralogists as a volcanic production; it is frequently intermixed with obsidian, and hence is classed by them as a variety of the latter mineral. It occurs in basaltic and porphyritic rocks, in large and somewhat angular concretions, which are composed of smaller roundish concretions, and those of others still smaller. The surface of the concretions is smooth, shining, and pearly. The colour is grey, passing into pearl-grey and greyish-black. It is translucent on the edges; it scarcely scratches glass, is easily frangible, and is fusible with intumescence before the blow-pipe into a white spongy glass. This mineral has been found near Sandy Bræ, in Ireland, in the island of Iceland, and in Mexico; it was first discovered in Hungary, where it occurs in large beds. It is classed by Mr. Jameson and Werner with obsidian, pitch-stone, and pumice, as forming a member of the pitch-stone family.

PEARL-STONE, *Pifolithe*, Fr. This mineral is composed of

carbonate of lime, slightly coloured yellowish-white or brown by the oxyd of iron; it is properly a calcareous tufa, containing rounded globules, varying in size, from a pea to a hazel-nut; these consist of concentric lamellæ, and often contain in the centre a minute fragment of quartz, felspar, or granite, and sometimes, but rarely, a double six-sided pyramid of rock-crystal; but in some instances, the centre of the globule is hollow. Pea-stone occurs in great masses in the vicinity of the hot springs at Carlsbad, in Bohemia; its formation we conceive to be analogous to that of roe-stone, and to be the result of crystallization; the particles included having disposed the calcareous matter to crystallize round them, in the same manner as a thread or fragment of a stone in a saline solution, generally disposes the crystals to shoot round them.

PERGASITE, the name given to a new mineral found at Erby, near Abo, in Finland. The following imperfect account is the only one we have of its character. It has a green colour; its form is an octahedron, with a cleavage in three directions; it is harder than fluor spar. The specific gravity is 3.11. Before the blow-pipe, it melts into a mass with a pearly-white lustre. Its constituent parts are given as under:

Silice	-	-	42.10
Magnesia	-	-	18.27
Lime	-	-	14.28
Alumine	-	-	14.08
Oxyd of iron	-	-	3.52
— of manganese	-	-	1.02
— of an unknown metal	-	-	0.33
Fluoric acid and water	-	-	3.90
Loss	-	-	2.59
			100.09

PERIDOT *Chrysolite*. See CHRYSOLITE and OLIVINE.

PETALITE, a mineral recently discovered in Sweden; externally, it nearly resembles some varieties of quartz, but the cleavage is two-fold, parallel to the sides of a rhomboidal prism; two of the planes are splendent, and two dull. The planes meet at angles of 100° and 80°, forming a four-sided prism with a rhomboidal base. Its colour is white with a slight tint of pink; it scratches glass, but yields with difficulty to the knife. When exposed to the flame of a blow-pipe it remains for some time infusible, but by continued heat it exhibits a glazed surface, which, on examination with a lens, appears full of minute bubbles. When triturated, the powder has the whiteness of snow. It is partially soluble in highly concentrated nitric acid, losing its colour, and changing to a dingy hue; the acid at the same time becomes clouded. The prussiated alkali threw down a green precipitate, and the solution assumed an amethystine colour, which afterwards changed to brown. The constituent parts of this mineral are stated to be,

Silice	-	-	80
Alumine	-	-	15
Manganese	-	-	3
And a new alkali	-	-	2

This alkali proves to be the oxyd of a new metal. The new alkali has been called lithia and lithion; it has a greater capacity of saturating acids than any other alkali, and forms a class of salts that are remarkably deliquescent. With alcohol, lithion yields a rose-coloured flame, like that communicated by strontian. The metal of lithion bears a strong resemblance to sodium. The alkali found in petalite contains 44.84 oxygen, united to a metallic base.

PETROLEUM, *Liquid Bitumen*, or *Mineral Oil*. (See BITUMEN.)

MINERALOGY.

BITUMEN.) It is essentially composed of carbon and hydrogen, containing less carbon than the solid bitumens, or than any kind of mineral coal. In Piedmont, Persia, Japan, and other countries, it is used in lamps, in place of oil, for lighting streets and public buildings; it is also mixed with earth, and burned for warming rooms. In Ava, numerous mines are worked for mineral oil or petroleum, the shafts are sunk through coal strata to the coal from whence the oil issues; it is intermixed with water, and is separated by decantation.

PHARMACOLITE, Arseniate of Lime, Chaux arseniatée, Häuy. Its colours are snow-white and milk-white, sometimes inclining to reddish or yellowish-white. It occurs in small reniform botryoidal and globular masses; sometimes it incrusts other minerals, or is crystallized in small diverging capillary crystals. Externally, it has a silky glimmering lustre; internally, it is shining or glistening. The structure is delicately radiated, either straight, diverging, or stellular, and sometimes fibrous. It yields to the nail, and is easily frangible. The specific gravity is 2.5. According to Klaproth, the constituent parts are,

Lime	-	-	-	-	25.00
Arsenic acid	-	-	-	-	50.54
Water	-	-	-	-	24.46
					100.00

According to John,

Lime	-	-	-	-	27.28
Arsenic acid	-	-	-	-	46.58
Water	-	-	-	-	23.86
					97.72

There is an earthy variety of pharmacolite, which occurs in thin crusts, and is dull and opaque. Pharmacolite is found in veins in granite, with ores of cobalt and native arsenic.

PHOSPHATE of Copper, Cuivre phosphaté, Häuy. Under the ores of copper, one species of this mineral is described, which was the only one then known. Mr. Jamefon makes three sub-species of phosphate of copper; foliated phosphate of copper, fibrous phosphate of copper, and compact phosphate of copper.

Foliated Phosphate of Copper, Cuivre phosphaté rhomboidal, Häuy, has a greyish-black colour externally, but internally is emerald-green, verdigris-green, and leek and olive-green. It occurs crystallized in octahedrons, which are sometimes lengthened or cuneiform; also in rhomboids with small curvilinear faces; the edges and angles are sometimes truncated. The structure is lamellar, the lustre shining, between vitreous and pearly; it is translucent. This ore is insoluble in water, but dissolves without effervescence in nitric acid. Before the blow-pipe, it fuses into a brownish globule, which spreads on the surface of the charcoal by a continuance of the heat, and acquires a reddish-grey metallic lustre. The globule on cooling crystallizes into three-sided and six-sided facets. According to Bucholz, it is a compound of copper and phosphoric acid. It has been found in the neighbourhood of Neufotil in Hungary, and at Virneberg, near Rheinbrechtenbach, on the Rhine; at the latter place it occurs with fibrous phosphate of copper; the latter mineral is found massive, botryoidal, and in crusts; it has a divergingly fibrous or radiated structure.

Compact Phosphate of Copper, Cuivre phosphaté compacte, Häuy, has the same localities as the foliated sub-species; it

occurs massive, reniform, botryoidal, and incrusting; it has a flat conchoidal fracture, a fibrous structure may sometimes be observed. It contains near 1.81 parts of phosphoric acid united with 68 of copper.

PHOSPHATE of Manganese. See **MANGANESE-Ores.**

PHOSPHORITE, Common, and PHOSPHORITE, Earthy. These minerals have been classed by mineralogists as varieties of apatite; but Mr. Jamefon makes phosphorite as a distinct species, which he divides into two sub-species.

Common Phosphorite, Massive Apatite, Aikin; Chaux phosphaté terreuse, Häuy; has generally a yellowish, greenish, or reddish-white colour; it occurs massive, stalactitic, reniform, and incrusting, also crystallized in six-sided tables; it is opaque, soft, and easily frangible. The specific gravity is 2.81. When rubbed in an iron mortar, or laid on hot coals, it emits a greenish light. According to Pelletier, its constituent parts are,

Lime	-	-	-	-	59.0
Phosphoric acid	-	-	-	-	34.0
Silex	-	-	-	-	2.0
Fluoric acid	-	-	-	-	2.5
Muriatic acid	-	-	-	-	0.5
Carbonic acid	-	-	-	-	1.0
Oxyd of iron	-	-	-	-	1.0
					100.

In part of Estremadura in Spain near Lagrofán, it forms whole beds that alternate with lime-stone and quartz.

Earthy Phosphorite consists of dull earthy particles, loosely cohering, and appears to be the preceding mineral in a decomposing state, intermixed with earthy matter. We think the characters and constituent parts of these minerals entitle them to be classed merely as varieties of apatite. The multiplication of species, where no sufficient specific difference exists, tends to retard the progress of useful knowledge, and ought not to be unnecessarily introduced.

PHOSFORMANGAN. Phosphate of manganese. See **MANGANESE.**

PICROLITE, a mineral described by Hanfmann. It is principally composed of the carbonate of magnesia. According to the description of Mr. Jamefon, (*Mineralogy*, vol. ii. p. 537.) its colours are leek-green, mountain-green, or straw-yellow. It occurs massive; internally it is dull or glimmering and pearly. The fracture is long, splintery, which passes by gradation to flat conchoidal. In some instances, it shews a delicate concentric fibrous structure. It sometimes occurs in concretions which are either concealed or have undulating lamellæ. It is translucent on the edges, and is rather hard, and difficultly frangible. It feels meagre, and is infusible. The specific gravity is 2.53. It appears to be allied to ferpentine and talc.

PINITE. This mineral is nearly allied to mica. It occurs crystallized in regular six-sided prisms, which, according to Häuy, is the primitive form. The prisms are sometimes truncated on the edges and angles. Massive varieties of pinite also occur in thick and straight lamellar concretions. (See **PINITE**.) This mineral is found in the granite veins at St. Michael's Mount, Cornwall, and in some parts of Scotland in porphyry.

PIPE-CLAY. See **CLAY**, and **PORCELAIN CLAY, Ad-denda.**

PISTACITE, or Epidote. See **PISTAZITE**, and **EPIDOTE, Ad-denda.**

PITCH-COAL, or Jet. See **JET.**

MINERALOGY.

PITCH-ORE, or *Pitch-blende*, an ore of Uranium. See URANIUM, and PITCH-ORE.

PITCH-STONE, *Resinite*, and *Petro-filix resinite*, Fr. This mineral is named from the striking resemblance which some varieties have in colour and lustre to pitch. Its prevailing colours are dark-green, from which it passes into black, grey, and blue, to brown and red. It is feebly translucent, and has a glitening or shining vitreo-refinous lustre. It occurs massive in veins and beds of considerable magnitude. Pitch-stone is sometimes columnar, and sometimes in thick and wedge-shaped concretions, or in somewhat globular or curved lamellar distinct concretions, and sometimes it has a flaty structure. The fracture is more or less perfectly conchoidal, or passing into splintery. The fragments are angular and sharp-edged. It scratches glass, is rather easily frangible, and is fusible into a grey spongy enamel. Some varieties of this mineral, however, fuse with great difficulty by the blow-pipe. The specific gravity of pitch-stone is about 2.3. According to Klaproth, its constituent parts are,

Pitch-stone of Meiffon.

Silex	-	-	73.00
Alumine	-	-	14.50
Lime	-	-	1.00
Oxyd of iron	-	-	1.00
Oxyd of manganese	-	-	10
Soda	-	-	1.75
Water	-	-	8.50
			99.85

Pitch-stone is found in various parts of Scotland, and in the islands of Rum, Egg, and Arran. It bears a near resemblance to obsidian, or volcanic glass, into which it appears to pass, and also into pearl-stone. It is regarded by many geologists as a volcanic product. Like basalt, it intersects rocks of different formations, from granite to sand-stone, and is intimately associated with basaltic rocks.

PLASMA has generally a dullish-green colour, with yellowish or whitish dots, a glitening lustre, a conchoidal fracture, is translucent, and rather harder than quartz. It consists of about ninety-seven parts of silic, and appears to be properly a green variety of flint. It was considered by the Romans as a gem, and figures were engraved upon it. Most of the specimens in collections were found in the ruins of Rome.

PLATINA. See PLATINA.

PLEONASTE. See CEYLANITE, *Aldenda*.

PLUMBAGO. Graphite or black-lead. See PLUMBAGO, and GRAPHITE.

PORCELAIN-CLAY. (See PORCELAIN.) The porcelain-clay of Cornwall occurs in beds of considerable thickness in the parish of St. Stephen's. According to Wedgwood, it consists of sixty parts alumine, and forty of silic. Porcelain clay originates from the decomposition of granitic rocks, abounding in feldspar, and frequently contains portions of quartz and mica. The absence of iron in porcelain-clay is what constitutes one of its most essential properties,—that of remaining white after burning. The Kaolin or Chinese porcelain-clay contains a much larger portion of silic than of alumine.

PORCELLANITE, or *Porcelain Jasper*, (see JASPER,) appears to be formed accidentally by fires in coal-mines, which have indurated and semivitrified beds of coal-shale or slate-clay.

POT-STONE, *Lapis ollaris*; *Talc olivare*, Haüy. (See VOL. XXXIX.

) This mineral appears to be indurated talc, passing into serpentine; with the latter rock, it is frequently associated. It has a curved and undulatingly-lamellar structure, passing into flaty. It is very soft, sectile, and greasy to the feel, is translucent on the edges, and affords a white-coloured streak. It is infusible before the blow-pipe. The analysis of this mineral given by Tromsdorf is,

Silex	-	-	39
Magnesia	-	-	16
Oxyd of iron	-	-	10
Carbonic acid	-	-	20
Water	-	-	10

Near Inverary there is a quarry of talcous slate, of which appears to pass into pot-stone, and can be turned in the lathe; of this stone, Inverary Castle is built. Pot-stone was extensively used in Upper Egypt for culinary vessels. They were found to resist the action of fire, and did not communicate any taste to the food boiled in them. Quarries of pot-stone were worked on the banks of the Lake of Como from the beginning of the Christian era to the year 1618, when the mountain fell down on the 25th of August, and destroyed the neighbouring town of Pleurs. This town had annually raised flintone from these quarries to the value of 60,000 ducats. Pot-stone is also used for lining ovens and furnaces, and is remarkably durable.

PRASE, *Quarz hyalin vert obscur*, Haüy, is translucent green quartz, the green colour being derived from an intimate intermixture of quartz and actinolite. See QUARTZ, and PRASIUS.

PRECIOUS Garnet. See GARNET.

PREINITE. (See PREINITE.) This mineral is divided into two sub-species by Mr. Jamefon; foliated prehnite and fibrous prehnite. The prevailing colours are, green, greenish-white, and yellowish-white. It occurs both massive and crystallized in oblique four-sided tables, or in six or eight-sided tables; also in four-sided and six-sided prisms. The crystals are generally attached by their lateral plains, and form diverging groups. The cleavage is single, parallel to the short diagonal of a rhomboidal prism, the planes of which are inclined at angles of 103° and 77°. The lustre is shining and pearly; it is translucent or transparent, scratches glass with difficulty, and intumesces before the blow-pipe. Prehnite was discovered by Mr. Bakewell in a rock basaltic amygdaloid, near Berkley in Gloucestershire, accompanied with green earth and massive lamellar prehnite, or kenpholite. This is the only English locality of these minerals at present known. It was first brought from the Cape of Good Hope.

Fibrous Prehnite has a delicate fibrous structure, either straight, diverging, or stellular. According to Langier, its constituent parts are,

Silex	-	-	42.50
Alumine	-	-	28.50
Lime	-	-	20.40
Soda and Potash	-	-	0.75
Oxyd of iron	-	-	3.00
Water	-	-	2.00
			97.15

Both sub-species of prehnite bear a near resemblance to zeolites, but they do not gelatinize with acids, and they become electric by heating.

PUMICE. See PUMICE-STONE, and VOLCANIC PRODUCTS.

PYCnite *Schorlite*, or SCHORLACEOUS Beryl. (See PYCnite.)

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PYCNITE.) The crystals of this mineral are long hexahedral prisms, and are deeply streaked longitudinally. They have a cleavage at right angles to the axis of the prism. Pycnite is now considered by Häuy as a variety of the topaz.

PYRITES. See **PYRITES.**

PYROPE. This mineral is now regarded by Häuy as a variety of the precious garnet, with an accidental portion of magnesia derived from the rock in which it is imbedded.

PYROPHYSALITE. See **PYROPHYSALITE.**

PYROSMAILITE. Native muriate of iron. See **IRON-ORES, Addenda.**

PYROXENE, Augit. See **PYROXENE and AUGIT, Addenda.**

QUARTZ, Quartz hyalin, Fr. See **QUARTZ.**

Common Quartz, Rock Crystal, Amethyst, and Cairngorm Stone, or Clove-brown Quartz, Aventurine Quartz, and Refe or Milk Quartz, are essentially the same mineral substance or pure silic, varying only in transparency or colour, owing probably to a very slight admixture of the other earths or metallic oxyds, an admixture which may be regarded as accidental, and which is scarcely appreciable by chemical analysis. According to Bucholz, rock-crystal is composed of 99 $\frac{1}{2}$ of silic. It is probable, however, that many minerals, which have hitherto been classed with quartz from bearing in many characters a close resemblance to it, may contain other ingredients besides silic in such proportions as to constitute them distinct species. This opinion is rendered more probable from the recent discovery of a mineral in Sweden, called petalite, which might easily be mistaken for a variety of quartz, but which contains a considerable portion of alumine, and two parts in the hundred of an alkali heretofore unknown. See **PETALITE, Addenda,** and **ROCK-CRYSTAL.**

QUICKSILVER. See **MERCURY, Ores of.**

REALGAR. See **ARSENIC-Ores,** and **REALGAR.**

RED Antimony Ore. (See **ANTIMONY-Ores,** and **RED Antimony.**) A variety of red antimony-ore, called tinder-ore, is described by Mr. Jameson as occurring in delicate flexible leaves, which are opaque and friable, foil strongly, and swim on water. Tinder-ore contains a portion of silic.

RED Cobalt-Ore. (See **COBALT-Ores.**) This species of ore is divided by Mr. Jameson into three sub-species, *earthy red cobalt-ore* or *cobalt ochre*, *slag red cobalt ochre*, and *radiated red cobalt-ore* or *cobalt bloom*; *Cobalt arseniaté aciculaire*, Häuy. The analysis of this ore by Bucholz gives

Cobalt - - - - -	39
Arfenic acid - - - - -	38
Water - - - - -	23
	100

This ore has been found at Alva, in Stirlingshire, and at Tyndrum; also in lime-stone in Linlithgowshire, and at the Dolcoath mine in Cornwall. Slaggy red cobalt ochre has a muddy crimson-red colour, or dark hyacinth-red, which passes into chestnut-brown. It occurs in thin crusts, and sometimes reniform. It has a shining and resinous lustre, a conchoidal fracture, and is translucent, soft, and brittle.

RED Iron-stone. See **IRON-ORES, Addenda.**

RED Lead-ore, or Chromate of Lead. See **LEAD-ORES.**

RED Manganese-ore. See **MANGANESE.**

RED Silver-ore, or Ruby Silver, where read—before the blow-pipe on charcoal.

REDDLE, Red Chalk, or Red Ochre. See **REDDLE.**

RETINASPHALTUM. See **RETINASPHALTUM.**

REUSSITE, the name given to a salt which occurs in the country round Sedlitz, and at Pilm near Brux. It forms a mealy efflorescence, and is also crystallized in flat six-sided prisms and in acicular crystals. According to Reufs, it consists of

Sulphate of soda - - -	66.04
Sulphate of magnesia - - -	31.35
Muriate of magnesia - - -	2.19
Sulphate of lime - - -	0.42
	100

RHOMB Spar. See **BROWN Spar, Addenda.**

ROCK Butter. (See **ROCK Butter.**) This mineral appears to be a sub-sulphate of alumine. It oozes from aluminous rocks.

ROCK Cork; Aßbeste Trepe, Häuy. See **ROCK Cork.**

ROCK-CRYSTAL. (See **QUARTZ.**) This is the purest variety of quartz. Very large and brilliant rock-crystals occur in various parts of Scotland. The smoke-grey or clove-brown crystals are called cairngorm, from a place in the upper part of Aberdeenshire, where they occur in alluvial soil along with beryl and topaz. The largest rock-crystals hitherto found come from the island of Madagascar. Faujas St. Fond mentions a crystal imported from thence into France, which weighed upwards of one hundred and fifty pounds. Very brilliant groups of rock-crystal occur in Dauphny. Vases of rock-crystal were highly prized by the ancients. A vase, broke by the emperor Nero in a fit of despair, was estimated at 15,000 livres. Different colours may be communicated to rock-crystals artificially, by heating them and plunging them into different-coloured solutions.

ROCK-SALT. (See **ROCK-SALT.**) According to the analysis of Dr. Henry, the rock-salt of Cheshire contains, in 1000 parts,

Muriate of soda - - -	983 $\frac{1}{4}$
Sulphate of lime - - -	6 $\frac{1}{2}$
Muriate of magnesia - - -	0 $\frac{3}{4}$
Muriate of lime - - -	0 $\frac{1}{4}$
Insoluble matter - - -	10
	1000

ROCK-WOOD, or Ligniform Aßbestus. See **ASBESTUS.**

ROE-STONE, or Oolite; Chaux carbonatée globuliform, Häuy. See **ROE-STONE.**

ROSE Quartz, or Milk Quartz. See **QUARTZ.**

RUBELLITE, called Red Schorl, a variety of tourmaline. See **RUBELLITE,** and **TOURMALINE.**

RUBY, Oriental, or Red Sapphire. See **GEMS,** and **SAPPHIRE.**

RUBY Spinelle. (See **GEMS** and **RUBY.**) The spinel ruby is the common ruby of the jewellers. It differs from the oriental ruby in the form of its crystallization, and contains a portion of magnesia and chromic acid. The former is nearly unimixed alumine. When these two gems are cut, it is, however, difficult to distinguish them. The oriental ruby is harder than spinel. Though the prevailing colour of the common ruby or spinel is red, yet it is sometimes blue-green or yellowish-brown. The carmine-red is called the spinel ruby; the cochineal ruby is called the balais ruby, from Balachan, the Indian name of Pegu, where it is found. The specific gravity varies from 3.50 to 7.30; that of oriental ruby from 3.97 to 4.28. The latter is a true sapphire.

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RUTILE, or *Sphene*; *Titane oxidé*, Häüy. (See **RUTILE**.) This mineral, which appears to be on analysis a pure oxyd of titanium, (see **TITANIUM**), is of a dark blood-red colour, or light-red and brownish-red. It occurs massive, disseminated, membranous, and in crystals. The crystals are rectangular four-sided prisms, oblique four-sided prisms, and also six and eight-sided prisms. The crystals are small and often capillary. It occurs imbedded in drusy cavities, in granite, sienite, gneiss, mica-slate, chlorite-slate and hornblende-slate, and in lime-stone. It has been found in the granite of Cairngorm, the lime-stone of Ramech, and at Craig Gailleach, near Killin, imbedded in quartz, also near Bedgalest, in Caernarvonshire.

RUTILITE, *Titane siliceo calcaire*, or *Sphene*. See **RUTILITE** and **SPHENE**.

SAHLITE. (See **SAHLITE**.) *Pyroxene laminaire gris verdâtre*, Häüy. According to Bournon, the primitive form of sahllite is a rectangular four-sided prism, having rectangular bases, which are inclined on the two opposite sides of the prism, so as to form angles of 109°, 15, and 73°, 45: hence he considers it as a distinct species from augit. According to Jameson, the cleavages of sahllite are five-fold, one parallel with the terminal planes, two with the lateral planes, and two with the diagonals of the prism; the three first are made with great facility. The cross fracture of sahllite is uneven and dull; that of augit, though uneven, generally inclines to conchoidal, and has a considerable degree of lustre.

SAL AMMONIAC, *Native*; *Ammoniaque muriatée*, Häüy. (See **SAL AMMONIAC**.) This salt is divided into two sub-species by Werner, *volcanic sal ammoniac* and *conchoidal sal ammoniac*. The former occurs in fissures, or coating volcanic rocks, and also in the vicinity of burning beds of coal. The latter occurs with sulphur, in indurated clay, or clay-slate, in Bucharica. According to Klaproth, it contains 2.50 of sulphate of ammonia, with 97.50 of the muriate.

SAPPACE, *Kyanite*; *Disthene*, Häüy. See **SAPPACE**, and **KYANITE**, *Addenda*.

SAPPHIRE, *Telestie*, and *Corindon hyalin*, Häüy. The common forms of the crystals of sapphire are the perfect six-sided pyramid and six-sided prism, or the double six-sided pyramid. These forms are frequently variously modified by truncations on the angles and extremities. (See **GEMS**, **SAPPHIRE**, and **RUBY**, *Addenda*.) The red sapphire is the oriental ruby; it differs a little from the blue sapphire in its constituent parts, which, according to Che- nevix, are,

Alumine - - - -	90
Silex - - - -	7
Oxyd of iron - - - -	1.2
	98.2

Sapphire occurs in alluvial soil along with pyrope, zircon, and iron-stone, at Podsedlitz and Trziblich, in Bohemia; in the banks of the stream Riou, near Expailly, in France; also at Brendole, in the Vicentine, and in Portugal.

SARCOLITE, *Red Zeolite*. See **SARCOLITE** and **ZEOLITE**.

SARDE, *Sardoine*, a reddish-brown cornelian, which appears of a deep blood-red when held between the eye and the light.

SARDONIX is a cornelian composed of white and red layers.

SASSOLIN, *Native Boracic Acid*. See **SASSOLIN**.

SATIN-SPAR, *Chaux carbonatée fibreuse conjointe*, Häüy. See **SATTIN-SPAR**.

SAUSSURITE, *Felspath Tenace*, Häüy; a mineral so called after the older Saussure. It was considered by him as nearly allied to nephrite or jade, (see **NEPHRITE**, *Addenda*), but is now classed with the felspar family. It occurs massive, disseminated, and in rolled pieces, in various parts of Switzerland and Norway, Finland, Italy, France, and Savoy, and it forms a constituent part of the well-known rock in Corfica, called the *Verde di Corfica*, which is composed of diallage and fassurite. It occurs with diallage metalloide near the Lizard Point, in Cornwall. The colours are white-grey and green, of various tints; green or yellowish, or greenish-white, are the most prevailing colours. Internally the lustre is dull or faintly glimmering.

The fracture is splintery; but according to Mr. Jameson, an imperfectly foliated structure may be discerned with a double rectangular cleavage. It is faintly translucent on the edges, is extremely tough, and so hard, as to scratch glass; the feel is somewhat unctuous. The specific gravity of fassurite is 3.20 to 3.31. According to Saussure, the constituent parts are,

Silex - - - -	44
Alumine - - - -	30
Lime - - - -	4
Soda - - - -	6
Potash - - - -	0.25
Iron - - - -	12.50
Manganefe - - - -	0.05
	96.80

According to Klaproth,

Silex - - - -	49
Alumine - - - -	24
Lime - - - -	10.50
Magnesia - - - -	3.75
Soda - - - -	5.50
Iron - - - -	6.50
	99.25

Before the blow-pipe, fassurite melts on the edges and angles; but according to Mr. Jameson is not entirely fusible.

SCAPOLITE, *Paranthine*, Häüy. (See **SCAPOLITE**.) This mineral has been divided by Mr. Jameson into three sub-species; radiated scapolite, foliated scapolite, and compact scapolite. *Foliated scapolite* has a three-fold and rather oblique-angular cleavage; the cross fracture is small and fine-grained, uneven or small conchoidal. This mineral, besides occurring with the other sub-species in Scandinavia, is found along with schorl in granitic masses that are imbedded in compact felspar, or white-stone, on the north-western acclivity of the Saxon Erzgebirge. *Compact green scapolite* is the wernerite of Häüy. It occurs both massive and crystallized in rectangular four-sided prisms, acuminated by four planes set on the lateral edges. Compact red scapolite occurs along with the green sub-species, but is of a blood-red colour. All the varieties of scapolite decay very readily on exposure to the air.

SCHORL, *Tourmaline noir*, Häüy. (See **SCHORL**.) The constituent parts of schorl, as stated by Klaproth, vary

4 D 2 considerably

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considerably from the analysis of Gerhard, which we have given, and are,

Silice	-	-	-	-	36.75
Alumine	-	-	-	-	34.50
Magnesia	-	-	-	-	0.25
Oxyd of iron with a trace of } manganefe	-	-	-	-	21
					92.50

According to Gerhard,

Silice	-	-	-	-	36.50
Alumine	-	-	-	-	31.00
Magnesia	-	-	-	-	1.25
Oxyd of iron with a trace of } manganefe	-	-	-	-	23.50
					92.25

The crystals of schorl are longitudinally streaked, and have externally a shining lustre. It occurs in the granite rocks of Cornwall, and intermixed with quartz, when it forms a compound rock, known to Cornish miners by the name of *cockle*. Very magnificent crystals of schorl have recently been discovered near Bovey Heathfield, in Devonshire. See TOURMALINE.

SCHILLER-SPAR, *Diallage metalloide*, Häüy, occurs most frequently in laminae disseminated in serpentine, and is regarded by some mineralogists as crystallized serpentine. The colours are, olive-green, pinchbeck-brown, and yellowish-brown. The lustre of the principal fracture is splendid and pseudo-metallic; the cross fracture is dull and glimmering. The cleavage is distinct in the direction of the laminae. According to Bournon, the primitive form is a rectangular four-sided prism, in which the bases are set on the broadest lateral planes, forming with them angles of 85° and 95°. The prism is divisible both in the direction of the lateral and terminal planes, but most easily parallel with the latter. Schiller-spar is translucent in thin laminae; it yields a greenish-grey streak, is sectile, and softer than hornblende.

SCHORLACEOUS Beryl. See PYCNITE.

SELENITE, or *Crystallized Gypsum*. See GYPSUM.

SERPENTINE, *Noble and Common*. See SERPENTINE.

SHALE, *Coal-Shale and Bituminous Shale*, a name given to the argillaceous strata which accompany coal. These consist of clay more or less indurated and flaty, and intermixed with a portion of carbonaceous or bituminous matter.

SIBERITE, a name given by some mineralogists to *Rubellite*; which see.

SILVER-ORES. (See SILVER.) A species of native silver occurs in Norway, which contains 28 parts in the 100 of gold, and is called *auriferous native silver*. On account of the gold, its specific gravity is greater than native silver. Its other characters, except the colour, (which inclines to brass-yellow,) agree with *native silver*; which see, under SILVER-ORES.

An ore of silver containing bismuth has been found in one mine on the Schapbach, in the Black Forest. It is called *bismuthic silver*. It is a pale lead-grey, is soft, sectile, and easily frangible. Before the blow-pipe metallic globules ooze out, which, on the addition of borax, unite in one metallic button, which is brittle, and of a tin-white colour. It contains 27 parts of lead, 33 of bismuth, and 15 of sul-

phur, combined with a portion of iron and sulphur, and one part copper.

Corneous Silver-Ore, or *Horn Silver*, is divided by Mr. Jameson, in the last edition of his Mineralogy, into four sub-species; *conchoidal*, *radiated*, *common*, and *earthy corneous silver-ore*.

Conchoidal corneous Silver-Ore.—Its colours are greyish or greenish-white. It occurs massive in compact lime-stone, at Guantahoygo in Peru; it has an adamantine lustre, and is the purest kind of corneous silver known, containing

Silver	-	-	-	-	76
Oxygen	-	-	-	-	7.6
Muriatic acid	-	-	-	-	16.4

The *radiated corneous Silver-Ore* has a dark-green colour, and, like the preceding, has hitherto been found only in South America.

Common corneous Silver-Ore, (see SILVER-ORES,) has been found in some of the mines in Cornwall, particularly at Huel-Mexico, and in a mine near Peranzabula, on the north-east of Cornwall. In the analysis of this ore, we have stated the constituent parts at 68 of silver, and 28 of muriatic acid; but 6 parts of the latter are oxygen.

Earthy corneous Silver-Ore is very soft, and almost friable. This mineral is an intermixture of corneous silver-ore and alumine.

Earthy Silver-Glance appears to be a decomposing sulphuret of silver. It has a blueish-black colour, and varies from friable to solid; it is dull or glimmering, but yields a metallic streak; it occurs with other ores of silver in veins.

Under the localities of silver in England, in the article SILVER-ORES, for Benallan & Beeralton, Devonshire. One of the richest repositories of silver is the Weal Duchy Mine, on the banks of the Tamar, above Plymouth. Silver-ores occur there in regular veins, but are also disseminated in nodules, through the rock itself, which is killas or clay-slate. The ores are, native capillary silver in considerable branches, vitreous silver-ore, black silver, and ruby silver-ore. Under the article SILVER, we have given the annual quantity of gold and silver obtained in Europe, South America, and part of Asia, as given by Humboldt, in kilogrammes, which reduced to the value of the pound sterling is as under:

	Gold.	Silver.
Europe - -	178,697	468,177
Northern Asia	74,124	192,966
America - -	2,382,315	7,071,830
		7,732,973

Total annual value 10,368,109*l.*; a sum not equal to the payment of one-half of the interest of the national debt of Great Britain!

SLATE, or *Slate-Clay*, Werner. See SLATE.

SLATE-SPAR, *Chaux carbonatée nacré*, Fr. (See SLATE-SPAR.) Though this is made a distinct species of the limestone family by some mineralogists, it is composed of carbonate of lime with an admixture of about three or four parts in the hundred of manganese or iron with water, to which probably its nacry lustre may be owing. It occurs in some parts of Cornwall, and in Scotland.

SILKENSIDES, a name given by the Derbyshire miners to galena or lead-glance, when it forms a smooth polished surface or lining to veins.

SMARAGDITE, green diallage; *Diallage verte*, Häüy. See DIALLAGE.

SOAP-STONE, a variety of steatite, is found in Cornwall, and

and extensively used in the porcelain manufacture at Worcester. It has a milk-white or greenish-grey colour, mottled with a muddy-purple; it is very unctuous to the touch, yields to the nail, and falls to pieces in hot water. Before the blow-pipe, it is friable into a somewhat translucent enamel. According to the analysis of Klaproth, it contains

Silex	-	-	-	45.00
Alumine	-	-	-	9.23
Magnesia	-	-	-	24.75
Oxyd of iron	-	-	-	1.00
Potash	-	-	-	0.75
Water	-	-	-	18.00
				98.73

Under the article STEATITE, it is stated to differ from common steatite by the absence of alumine; it should have been by the excess of alumine. Some varieties of steatite scarcely contain a trace of the latter earth.

SODA, *Native*, or *Natron*. See NATRON, *Addenda*.
 SODALITE. (See SODALITE.) This mineral is classed by Mr. Jameson with the feldspar family, on account of its external characters; it differs from feldspar in the proportions of its constituent parts, and soda supplies the place of potash, which is a constituent of most feldspars.
 SOMMITE, or *Nepheline*. See SOMMITE and NEPHELINE, *Addenda*.

SPARRY *Iron-stone*. See IRON, and IRON, *Addenda*.
 SPECULAR *Iron-Ore*. See IRON.
 SPHENE. See SPHENE, RUTILE, and TITANIUM.
 SPINEL. See GEM, RUBY, and SPINEL.
 SPODUMENE. (See SPODUMENE.) According to D'Andrada, this mineral before the blow-pipe first separates into gold-coloured scales, and then into a kind of powder or ash. It is recently found to contain 8 per cent. of the new alkali lithia.

STAUROLITE, or *Grenatite*. See STAUROLITE and GRENATITE, *Addenda*.

STAUROLITE, the name given by Häuy to staurolite.
 STEATITE. See STEATITE and SOAP-STONE, *Addenda*.
 STILBITE. See ZEOLITE.
 STRIPED *Jasper*. See JASPER.
 STRONTIANITE, or *Strontian*; *Strontian carbonatée*, Fr. See STRONTIAN.

SULPHATE of Cobalt, of Copper, of Iron, of Lead, of Manganese, of Zinc. See the ores of each of these metals, where the native metallic are described.

SULPHATE of Soda, *Native*. See SODA.
 SULPHUR, *Common and Volcanic*. See SULPHUR.
 SULPHURETS, *Native*, are combinations of the different metals with sulphur. See PYRITES and the different metals.

SURTURBAND, or *Fibrous Brown Coal*, or *Bituminous Wood*, *Fibreux*, Fr. See COAL and WOOD-COAL.

SWINE-STONE, or *Fatid Lime-stone*. See SWINE-STONE.
 TABULAR SPAR. *Spath en Tables*, Häuy. See TABULAR SPAR.

TALC. See TALC.
 TANTALITE. See TANTALITE.

TELESIA, the name given by Häuy to the fapphire.
 TELLURIUM Ores, and *Tellurium*. See TELLURIUM.

THALLITE, or *Epidote*. See THALLITE.
 THUMMERSTONE, or *Asinite*. See THUMMERSTONE.

TILE-ORE, *Earthy and Indurated*, an ore of copper (see COPPER); the latter is considered by Werner as an intimate combination of red copper-ore and brown iron ochre, con-

taining from 10 to 50 per cent. of copper; the red varieties contain the greatest quantity of copper. The dark-brown variety, on account of the resemblance of its fracture to pitch, has been called pitch-ore (*Paberz*, Werner.)

TIN-STONE. See TIN.
 TIN PYRITES, or *Bell-Metal Ore*. See TIN.

TITANIUM. See TITANIUM.
 TOPAZ, *Topaze*, Fr. See TOPAZ and GEM.

TOURMALINE, *Tourmaline*, and *Le febril électrique*, Fr. See TOURMALINE.

TREMOLITE, *Grammatite*, Häuy. See TREMOLITE.
 TRIPOLI, or *Rotten-stone*. See TRIPOLI.

TUFA. See TUFA.
 TUNGSTEN. See TUNGSTEN.

VARIEGATED *Copper-Ore*, *Cuivre pyriteux hepatique*, Häuy, a native sulphuret of copper, which has a variegated or iridescent tarnish. See COPPER-ORES.

VESUVIAN, *Idocrase*, Häuy. (See VESUVIAN.) The primitive form of the crystals of Vesuvian is a right prism with square bases, differing little from the cube. Vesuvian is cut for ornamental purposes by the lapidaries at Naples, and is called the chrysolite of Vesuvian.

UMBER, *Argile ocreuse brun*, Fr. See UMBER.
 URAN MICA, or *Uranite*, and *Uran Ochre*. See URANIUM, *Ores of*.

WACKE, or *Wacken*. See WACKE.
 WAD. See WAD and MANGANESE.

WAVELLITE, or *Hydragillite*, *Diäspore*, Häuy. See WAVELLITE.

WHET-SLATE, or *Whetstone-Slate*, *Noverculite*, Fr. See SLATE and WHET-SLATE.

WHITE *Antimony-Ore*, *White Copper-Ore*, *White Manganese-Ore*, *White Silver-Ore*, and *White Vitriol or Sulphate of Zinc*. See each of these metals, and *Ores of*.

WITHERITE, or *Carbonate of Barytes*. See WITHERITE and BARYTES.

WOLFRAM, *Schelin Ferrugine*, Häuy. (See WOLFRAM.) This mineral occurs most abundantly in many of the mines of Cornwall, but has not yet been applied to any use.

YENITE, *Lievrit*, Werner. See YENITE.
 YTTRO-TANTALITE. See TANTALITE and YTTRO-TANTALITE.

ZEOLITE. See ZEOLITE.
 ZINC. See ZINC, *Ores of*.

ZIRCON and ZIRCONITE. See ZIRCON.
 ZOISITE. See ZOISITE.

MINGRELIA, l. 12, after gom, add—a kind of paste made of. At the clove, add—According to Reineggs, it contains four millions of fowls, and annually exports 12,000 flaves.

MINKALLI, an African term, denoting a quantity of gold, nearly equal to 100 sterling.

MINOT, in *Geography*, a town of America, in the district of Maine, and county of Cumberland, having 2020 inhabitants.

MIRZIN, r. WOLEIN.
 MODBURY, l. 33, r. 1811—1890—863 males; l. 34, 1027 females, 190 families, and 156.

MOFFAT, col. 2, l. 13, r. 1811; l. 14, r. 1824 persons, occupying 334 houses; 850 being males, and 974 females.

MOGO, l. 2, after gulf, add—which has one of the most secure roadsteads in the gulf, formed by Cape Botana to the E. and the point improperly called Certes to the W. and capable of holding the largest fleets.

MOHOCKS, a denomination given to a mob of disorderly people, who traversed the streets of London at night,

night, and amufed themfelves with wounding and diffiguring the men, and indecently expofing the women, in the year 1711. A reward of 100*l.* was offered by royal proclamation for apprehending any one of them.

MOLD, l. 6, r. 1811, the parifh, &c. 5083 perfons, occupying 1026 houfes; 2465 being males, and 2618 females: of whom 217 families are employed in trade and manufactures, and 180 in agriculture.

MOLE. See NÆVUS.

MOLLIA, in *Botany*, Ait. Hort. Kew. v. 2. 62. See POLYCARPÆA and HAGÆA.

MOLTON, SOUTH, col. 2, l. 15, r. 1811—520—2739.

MOLTON, *North*, an adjoining parifh, containing 329 houfes, and 1526 inhabitants.

MOLYBDENA. See MINERALOGY, *Addenda*.

MOLYBDENUM, in *Chemiftry*. The fpecific gravity of this metal, according to Hjelm, is 7.400; but according to Bucholz, who, from the greater heat he employed, obtained it in a more compact ftate, it is as high as 8.611. According to the experiments of this latter chemift, there are three oxyds of this metal, the *brown protoxyd*, the *blue* or *molybdous acid*, and the *white* or *molybdic acid*. Dr. Thomfon, from the experiments of Bucholz, deduces the weight of the atom of this metal to be 60.

MONAHAN, or MONAGHAN. Add—containing 725 inhabitants.

MONEY. See POLITICAL *Economy*.

MONFALOUT, r. See MANFALOU.

MONKTON, l. 2, r. 1248.

MONMOUTH, l. 3, r. feven for fix; l. 4, r. 22,150—1501.—Alfo, a town of the diftrict of Maine, in the county of Kennebeck, containing 1262 inhabitants.

MONMOUTH, col. 3, l. 37, r. 1811; l. 38, r. 3503. Add—The number of houfes is 661; that of males 1630, and of females 1873, of whom 375 families are employed in trade and manufactures, and 146 in agriculture.

MONMOUTHSHIRE, l. 10.—In 1811, the county was returned as containing 11,766 houfes, and 62,127 perfons; 30,987 males, and 31,140 females: 5815 employed in agriculture, and 4812 in trade, manufactures, and handicraft.

MONONGALIA, l. 2, r. 12,793 perfons, of whom 351 were flaves in 1810.

MONOPTERUS, in *Ichthyology*, a genus of fifhes of the order Apodes; the characters of which are, that the body is anguilliform, the noftrils placed between the eyes, and the fin caudal. The only animal of this genus hitherto difcovered is the *M. Javanicus*, blackifh, with a very fharp-pointed tail. It is a native of the Indian feas, and is very common about the coafts of Java, where it is confidered as excellent food.

MONROE. Add—containing 5444 inhabitants, of whom 376 were flaves in 1810.

MONSON. Add—containing 1674 inhabitants.

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MONTAGUE, EDWARD, col. 2, l. 8, for fine fhips r. fire-fhips.

MONTAGUE, l. 4, r. 934.

MONTAGUE. See MOUNTAGUE.

MONTENEGRINS, fo called from the Monte Negro, or Black mountain, near Cantaro, have been reckoned amongft the moft daring inhabitants of *Dalmatia*; which fee. The whole amount of thefe, who are fcattered over mountains, has been eftimated at about 60,000. All profefs the

Greek religion, but with feveral remains of fuperftition. The Morlacs, and other inland tribes of Dalmatia, are honeft and fincere barbarians, and the drefs of their vaivodes fomewhat refembles the Hungarian. The general peace of Europe has reftored tranquillity and prefent fecurity to them.

MONTGOMERY, in America, l. 3, r. 2954, of whom 747 were flaves in 1810; l. 6, r. 41,214, of whom 712 were flaves; l. 10, r. 237; l. 12, r. 595; l. 14, r. 30; l. 15, r. 29,703; l. 16, add—containing 580 inhabitants; l. 17, having 2693 inhabitants; l. 18, r. 8430; l. 19, r. 1696 flaves; l. 21, r. 8409 inhabitants, of whom 1099 were flaves; l. 24, r. 17,980—7572; l. 28, r. 8026 inhabitants, of whom 2629 are flaves; l. 29, r. 12,650 inhabitants, of whom 1691 are flaves. Add—Alfo, a town of Somerfet county, in New Jerfey, having 2282 inhabitants.—Alfo, a township of Franklin county, in Ohio, having 556 inhabitants.—Alfo, a county of Ohio, containing 7 townfhips, and 7722 inhabitants.

MONTGOMERY, in Wales, col. 2, l. 35, r. 1811; l. 36, the borough and—932—442 males, and 490 females.

MONTGOMERYSHIRE, col. 6, l. ult. r. 1811—51,931—25,373—26,558. Col. 7, l. 1, r. 3164 families; l. 3, r. 6369.

MONTICELLO, a town of Georgia, in Randolph county, having 89 inhabitants.

MONTIQUE, a town of Suffex county, in New Jerfey, containing 661 inhabitants.

MONTROSE. In 1811 the burgh and parifh contained 1064 houfes, and 8955 perfons; *viz.* 3837 males, and 5118 females: 170 families being employed in agriculture, and 1529 in trade, manufactures, and handicraft.

MONTVILLE, l. 3, r. 2187.—Alfo, a town in Maine, in Lincoln county, with 864 inhabitants.

MONTVILLE *Plantation*, a township of the fame, having 130 inhabitants.

MOON, a township of Alleghany county, in Pennsylvania, having 1622 inhabitants.

MOON, *Half*, a township in Centre county, in Pennsylvania, having 560 inhabitants.

MOON, *First* and *Second*, two townfhips of Beaver county, in the fame ftate, the former having 1035, and the latter 1245 inhabitants.

MOONSHEE, an Indian term fignifying a letter-writer or fecretary, and applied by Europeans to the native who inftructs them in the Perfian language.

MOONSTERLING, in *Geography*, a township of Kentucky, in Montgomery county, with 325 perfons, of whom 76 were flaves in 1810.

MOORE, a township of Northampton county, in Pennsylvania, having 1108 inhabitants.

MOOSH, the ancient Moxoene, called alfo Daran, a town of Armenia, occupying a fmall eminence, wafhed by the Euphrates, over which is a bridge of fifteen arches: badly built and thinly inhabited; but the adjoining country is fertile and populous. The natives of this diftrict, which is one of the Turkifh pachalics of Armenia, are a degenerate race, and faid to amount to 80,000 fouls; 12,000 of whom are Yezedis. Confiderable quantities of tobacco and manna are exported from hence.

MORAYSHIRE, col. 4, l. 32, r. 1811—6268—28,108; *viz.* 12,401 males, and 15,707 females: l. 32, r. 2635 families; l. 34, r. 1886.

MORELAND, l. 2, having 400—the other having 1692 inhabitants.

MORETON-HAMPSTEAD. In 1811 this parifh contained 337 houfes, and 1653 perfons; *viz.* 770 males, and

883 females: 263 families being employed in agriculture, and 43 in trade, manufactures, &c.

MORETON in the *Marshs*. In 1811 this parish contained 194 houses, and 928 persons; *viz.* 457 males, and 471 females: 60 families being employed in agriculture, and 91 in trade, manufactures, &c.

MORETOWN, a town of Chittenden county, in Vermont, having 405 inhabitants.

MORGAN, a town of Orleans county, in Vermont, having 135 inhabitants.—Also, a township of Greene county, in Pennsylvania, having 1621 inhabitants.—Also, a township of Knox county, in Ohio, having 388 inhabitants.—Also, a county of Georgia, having 2294 inhabitants.

MORIEVILLE PLANTATION, a township of Maine, in the county of Hancock, having 224 inhabitants.

MOROKINNEC, *r.* **MOROKINNEE** or **MOROTINNEE**.

MOROXYLIC ACID, in *Chemistry*, a name given by Klaproth to an acid principle obtained from a saline exudation from the *morus alba*, collected by Dr. Thompson in Sicily. This exudation contained the acid in question in combination with lime. When separated, it was found to possess the following properties:—It exists in the form of needle-like crystals, having the taste of fuccinic acid. It is not altered by exposure to the air. It dissolves readily in water and alcohol, and does not, like the moroxylate of lime, precipitate the metallic solutions. It is volatile, and may be sublimed without change; hence this is probably the best mode of obtaining it in a state of purity. The *moroxylates* are little known, and do not appear to possess remarkable properties.

MORPETH. In 1811 the borough contained 464 houses, and 3244 persons; *viz.* 1470 males, and 1774 females: 77 families being employed in agriculture, and 529 in trade, manufactures, or handicraft.

MORPHIA, the name which has been given to an alkaline principle existing in opium; the description of which, and of the other principles existing with it, will be found under opium. See **OPIMUM**.

MORRIS, l. 3, for five *r.* ten. Col. 2, l. 6, *r.* 21, 828—856 were slaves in 1810.—Also, a township of Washington county, in Pennsylvania, having 1679 inhabitants.—Also, a township of Greene county, having 944 inhabitants.

MORRISTOWN, l. 4, *r.* and in 1810, 3753 inhabitants, 214 being slaves.—Also, a town of Orleans county, in Vermont, having 550 inhabitants.

MORRISVILLE, l. 2, *r.* Bucks; add—having 961 inhabitants.

MORTLAKE. In 1811 the parish contained 346 houses, and 2021 persons; *viz.* 832 males, and 1189 females.

MOSUL, l. 2, after Nineveh, add—though others think that the village of Nunia, on the opposite bank of the Tigris, presents the position of this ancient city. It is situated in the pachalic of Bagdad; *dele* in the province of Diarbekir, situated:—l. 12, insert—The inhabitants are said to amount to 35,000 souls.

MOTACILLA, *r.* **RUBECULA**.

MOTHER-KILL. Add—containing 7445 inhabitants.

MOULTONBOROUGH. Add—It contained, by the census of 1810, 994 persons.

MOUNT HOLLY, l. 3, *r.* 922.

MOUNT Joy, after Lancaster *r.* county, having 1551; at the close, add—having 636 inhabitants.

MOUNT Pleasant, l. 4, add—having 1105 persons.—Also, a township of Wayne county, with 522 persons.—Also, a township of Washington county, having 1165 inhabitants.—Also, a township of the same state, in Westmoreland county,

having 1788 inhabitants.—Also, a township of Jefferson county, in Ohio, with 846 persons.

MOUNT Tabour, a town of Rutland county, in Vermont, with 209 inhabitants.

MOUNT Vernon. Add—containing 1098 inhabitants.—Also, a town of Hillsborough county, in New Hampshire, containing 762 persons.

MOUNTAGU. Add—See **MONTAGUE**.

MOUNTAIN CORK. See **MINERALOGY**, *Addenda*.

MOUNTAINS, col. 7, under *Ireland*, instead of l. 3, insert—Sleibh Donard, a mountain in the county of Down—2500. Col. 13, l. 10, *r.* Varenus.

MUCILAGE, *Chemical Properties of*. See **GUM**.

MUCOUS ACID, in *Chemistry*. See **SACCHARIC ACID**.

MUCOUS Membrane, &c. See **MEMBRANE**.

MUMBO-JUMBO, a kind of bugbear dressed in a mafquerade habit, formed of the bark of trees, and suspended upon a tree at the entrance of the Mandingo towns in Africa. It is much employed by the Pagan natives in keeping their women in subjection; for as the Kafirs, or infidels, are not restricted in the number of their wives, every one marries as many as he can conveniently maintain; and as it frequently happens that the ladies disagree, family quarrels sometimes rise to such a height, that the authority of a husband can no longer preserve peace in his household. In such cases, the interposition of Mumbo-Jumbo is called for, and is always decisive. This strange minister of justice, who is supposed to be either the husband himself, or some person instructed by him, disguised in the above-mentioned dress, and armed with the rod of public authority, announces his coming, when called for, by loud and dismal screams in the woods near the town. He begins the pantomime at the approach of night, and as soon as it is dark enters the town, and proceeds to the *hentang* (a kind of stage erected in every town, answering the purpose of a town-hall), at which all the inhabitants immediately assemble. Every married female, not knowing for whom the visit is intended, is alarmed, but when summoned must appear; and the ceremony commences with songs and dances, which continue till midnight, about which time Mumbo fixes on the offender. This unfortunate victim being thereupon immediately seized, is stripped naked, tied to a post, and severely scourged with Mumbo's rod, amidst the shouts and derision of the whole assembly; and it is remarkable, that the rest of the women are the loudest in their exclamations on this occasion against their unhappy sister. Day-light terminates this indecent and unmanly revel.

MUNI, col. 2, l. 3 from bottom, for many-mothered, for *r.* many-mothered fon.

MURENA, col. 3, *r.* **MYRUS**.

MURIATE of Ammonia. See **SAL Ammoniac**.

MURIATIC ACID, **MURIATES**, in *Chemistry*. See **CHLORINE**.

MUSCI, col. 8, l. 18, *r.* shrinks; l. 7 from bottom, *r.* efexual.

MUSHROOMS, *Chemical Properties of*. See **FUNGI**.

MUSKINGUM, l. 5, add—This county has 11 townships, and 10,036 inhabitants.

MUSOPHAGA, **PLANTAIN-Eater**, in *Ornithology*, a genus of birds of the Picæ order; the characters of which are, bill stout, triangular; the upper mandible elevated at the base, above the front; both mandibles dentated at the edges; nostrils in the middle of the bill; tongue entire, thickish; feet with three toes before and one behind. This genus is constituted by the blackish-violet plantain-eater, with crimson crown and quill-feathers, and a white stripe beneath the eyes. The bird, which is highly elegant, is of

of African origin, and is found in the province of Acra in Guinea, and is said to live principally on the fruit of the mufa or plantain-tree. Dr. Shaw, in the *Museum Leverianum*, has described this bird as a species of cuckoo, under the name of *Cuculus regius*; but in his *Zoology* it is a distinct genus.

MUSTELA, col. 3, under B. r. BARBARA, Guiana weasel; l. 3, r. Guiana.

MUSTELIA, in *Botany*, in memory of Mr. Mustel, who wrote, in *Phil. Trans.* v. 63, some "New Observations upon Vegetation."—Sprenkel *Tr. of Linn. Soc.* v. 6. 152. t. 13.—This plant is said to differ from EUPATORIUM, (see that article,) in having five minute scales accompanying the bristly feed-crown. How far such exist in any *Eupatorium*, or not, and whether they ought to make a generic distinction, merits inquiry.

MYLOCARYUM, from *μυλος*, a mill, and *καρυον*, a nut, alluding to the four spreading wings of the feed.—Willd. *Enum.* 454. Pursh 303. (Walteriana; Frazer's Cat.)—Class and order, *Decandria Monogynia*. Nat. Ord. *Ericæ*, Juss.

Eff. Ch. Calyx of five leaves. Petals five. Filaments swelling and angular in the middle. Stigma sessile. Capsule winged, of three cells. Seeds solitary.

1. *M. ligustrinum*. Privet-leaved Buck-wheat-tree. Willd.

n. 1. Pursh n. 1. t. 14. Sims in *Curt. Mag.* t. 162. Ait. *Epit.* 371. Sm. *Inf. of Georgia*, v. 2. 135. t. 68, without a name.—On the dry borders of swamps in Georgia, flowering in May and June. An elegant evergreen *shrub*, eight to twelve feet high. *Pursh*. Leaves alternate, stalked, obovate, acute, entire. *Flowers* white, sweet-scented, in terminal clusters. *Fruit* pendulous, resembling seeds of Buck-wheat, with three or four wings.

MYOXUS. At the clove, add—Dr. Shaw enumerates some other species, such as the Chryfurus, or gilt-tailed D., the *M. guerlingus*, or guerlinguet, and the African, or earless Dormouse.

MYRIANDRUS. Add—According to Xenophon, it was a Phœnician city, a mart-town, and many merchant-ships lay at anchor before it.

MYRICIN, in *Chemistry*, a name given by Dr. John to the substance that remains after bees'-wax, or the wax of the *myrica cordifolia*, has been heated with alcohol. This substance is insoluble in water, ether, and alcohol, both hot and cold. It is soluble in the fixed and volatile oils, and does not precipitate from the former of these. It melts between 100° and 140°, and is somewhat glutinous, but of the consistency of wax. Its sp. gr. is .900.

MYTHOLOGY of the *Hindoos*, l. 26 from bottom, for stories r. itores.

N.

NACHITOCHEs, l. 2, after Orleans, add—and in the territory of Orleans; its inhabitants in 1810 being 2870.

NACOGDOCHES, a small town of Louisiana, situated in N. lat. 31° 27'. W. long. 24° 17', on the Arroyo de la Nana, in a beautiful, healthy, well-watered country. This small town, and a few farms in the vicinity, are hitherto the only improvement made by the Spanish emigrants after the revolution of 98 years. A tribe of Indians, called Nadacos, resides about 30 miles N. of Nacogdoches, upon the headwaters of the Angelina, where they were found near a century ago by the French and Spaniards. The Nadacos are a poor inoffensive race, in peace with all their neighbours, both white and black.

NAGA, a name of the Hindoo mythological serpent, otherwise called *Sesha*; which see.

NAGANTEKA, in *Hindoo Mythology*, is a name of the hypogriph Garuda, the vehicle of the god Vishnu. It means the destroyer of serpents. Another of its names is *Superna*; which see.

NAIRIT, is one of the eight regents of the winds, or points of the heavens. He rules the south-west quarter, and is subordinate to Indra, regent of the firmament. (See INDRA.) These rulers of the cardinal and intermediate points are sometimes called *Marut* (which see). See also VIRUPAKSHA, meaning with a disagreeable countenance.

Another of his names is Karbura. He has a *sakti* or comfort assigned him, usually named *Nirriti*; which see.

NAIRN, l. ult. for 632 r. 613.

NAIRNSHIRE, col. 2, l. 46, number of houses was 1736, and the inhabitants, &c.

NAKAL, one of the champions of the Hindoo heroic poem, entitled the *Mahabarat* (which see). As that poem is supposed to be allegorical, and to represent the conflicts between man's virtues and vices, Nakal, one of the five sons of Pandu, is said to be a personification of temperance, and is made the twin-brother of Sahadeva, or chastity. Other commentators make them to represent beauty and wisdom. Their mother was Maderi, a wife of Pandu; which see.

NAKSHATRA, in *Astronomy*, is the name given by the Hindoos to the mansions which they assign to the moon. They seem to be the same, though not exactly coinciding, with the lunar stages of the Arabians, which they call *mansil*. The "Nakshatras, or aftertimes, marking the moon's path," are twenty-seven or twenty-eight in number. A table of them is given in the ninth volume of the Asiatic Researches, by Mr. Colebrooke, the president of the Asiatic Society. See also the second volume of the same work, together with the Indian zodiac, accompanied by an essay on its antiquity, by sir W. Jones.

The Hindoos ascribe the invention of their solar and lunar

lunar zodiacs to Dakṣha, who is mythologically represented as a son of Brahma, and they then give a free rein to their poetical imaginations, representing the Nakṣatras as the daughters of Dakṣha.

NALA, in *Hindoo Romance*, is a personage of considerable importance, though described as an ape. Others begat by the divine architect *Viśvakarma* (which fee); and he is said in the *Ramayana* to have been the builder of Rama's bridge, usually called Adam's bridge, from the continent to the island of Ceylon, or Lanka. See CEYLON and LANKA.

NAMUKI, is the name of a friend and companion of Indra, the regent of the firmament.

NANCEMOND. See NANSEMOND.

NANDANA, the name of the garden, or city, assigned by Hindoo fabulists for the delightful residence of their demigod Indra, the regent of the firmament. (See INDRA.) There are four cities or gardens of this name, and three of them are sometimes said to belong to Ganesa, or Pattear. One of them is called *Siva-nandana-puri*, the self-delighting city; *nandana* meaning delightful or happy.

NANDI, in *Hindoo Mythology*, is the name of the bull on which the god Siva rides. The bull, with the Hindoos, is the symbol of divine justice, as it is also of generation or production. See SIVA.

NANSEMOND, l. 4, r. 10, 324—4462.

NANTICOKE, l. 2, r. 28, 43 inhabitants, including 192 slaves in 1810.

NANTMILL for NANTRILL, l. 2, add—the former contains 1544, and the latter 1188 inhabitants.

NANTUCKET, l. 13, r. 6807.

NARAKA, one of the receptacles for sinners, or hells of the Hindoos. Of these, they have at least seventy-one; and their names are given in the *Inf. of Menu*, c. iv. v. 88, 89, 90.

NARAMEDHA, a term in the Sanskrit language signifying the sacrifice of a man. It cannot be doubted that human sacrifices were formerly offered by some tribes of Hindoos, although it is said, and may be reasonably believed, that in these days the practice is wholly discontinued. (See RUNEKA.) To the goddesses Parvati, or Bhavani, the consort of Siva, under her name of Kali, or the *black goddess*, these offerings, it would appear, were usually, if not always, made. The rules and regulations for this horrid sacrifice are laid down in a chapter, emphatically called the sanguinary chapter of the Kalika-Purana, which has been translated by Mr. Blaquiere, and published in the fifth volume of the Asiatic Researches, art. xxiii. No religious rite can be more minutely ordained and detailed.

Although it must appear evident, that human sacrifices were formerly legal and practised among Hindoos, they are most pointedly prohibited in very ancient, as well as in more modern books: such prohibition is, indeed, a farther, and of itself sufficient proof of the existence of the practice. In the Brahma Purana, (see PURANA,) every Naramedha, or man-sacrifice, is expressly forbidden; and in the fifth book of the *Sri-Bhagavat*, (see that article,) Sir W. Jones has pointed out the following emphatical words: "Whatever men in this world sacrifice human victims, and whatever women eat the flesh of male cattle, those men and those women shall the animals here slain torment in the mansions of Yama, (see YAMA,) and like slaughtering giants, having cleaved their limbs with axes, shall quaff their blood." Asiatic Researches, vol. iii.

In the first Veda an emblematical or vicarial sacrifice is ordained, in which men and animals are the victims, but are released after certain ceremonies.

VOL. XXXIX.

NARA-SINGHA, in *Mythology*, is the designation of the fourth avatara or incarnation of the Hindoo deity Vishnu. It means literally *man-lion*, such being the form in which this descent is related to have taken place.

Sir W. Jones furnished that this avatara, and the following of Vamana, (see VAMANAVATARA,) were allegorical references to the two presumptuous monarchs Nimrod and Belus, under the names of Hiranyakasipu and Beli, the former name meaning *with a golden axe*, or, according to other authorities, *clad in gold*. Hind. Panth. Af. Ref.

The three avatars, or descents of Vishnu on earth, that preceded that which is the subject of this article, were the Matsya or fish, the Kurma or tortoise, and the Varaha or the boar; under each of which words, having the common denomination of avatara postfixed, some account of them will be respectively found. A list of the ten grand descents, or *dasaavatara*, will be found under the article VISHNU. This is sometimes written Nri Sinha.

NARASINHI, or NARSINHI, or *Nrisinhi*, is the name given to the Hindoo goddesses Lakshmi, who became thus incarnated to accompany her lord Vishnu in his avatara or descent of Narasingha, as sufficiently explained under that article, and the others thence referred to.

NARAYANA, is a personification of rather a bold and apparently reprehensible nature. "The waters are called *nara*, because they were the first production of Nara, or the Spirit of God; and since they were his first *ayana*, or place of motion, he is thence named Narayana, or moving on the waters." *Inf. of Menu*, c. l. v. 10. See MENU.

On the whole, Narayana seems to refer in character more to Vishnu than to any other of the Hindoo deities.

NARAYANI, a name and form of the Hindoo goddesses Lakshmi. In this character, she is considered as the Sakti or consort of Narayana; which fee, and MATRI.

NARBETH, l. 9, r. 388.

NAREDA, or NARADA, in *Hindoo Mythology*, a personage among the Hindoos, deemed the mythological offspring of Brahma and Saraswati. In the popular histories of Krishna, Nareda is represented as his humble friend, on whom he passes many practical and whimsical jokes, metamorphosing him into a woman, &c. But in more serious books, his character is more corresponding with the magnificence of his origin. He is represented as a wife legislator, great in arms, arts, and eloquence; and, indeed, of such historical celebrity, that his actions are the subject of a Purana, named after him; some account of which is given under PURANA. He was also an astronomer, and an exquisite musician. Hence Saraswati, the patroness of science and harmony, is said to have been his mother. He farther invented the vina, a sort of lute, which Sir W. Jones remarks as a singular fact, is otherwise called *katchapi*, having the same meaning as *testudo*; and Nareda being also a frequent messenger of the gods, to one another, or to favoured mortals. His character, in these and other points, resembles that of Hermes, or Mercury.

NASH, l. 2, r. 7268—2897.

NASTICK, in *Philosophy*, the name of a sceptical sect of Hindoos. The word in the Sanskrit tongue means *negative*, and is intended to designate those who do not believe the Veda. Individuals of more orthodox sects call the Nasticks, materialists and atheists.

NASTURTIIUM, in *Botany*, (see our former article,) is now adopted to designate the Water-cress and its allies, separated by Mr. Brown from SISYMBRIUM, (see that article,) sect. 1.—Br. in *Ait. Hort. Kew.* v. 4. 109.—Class

and order, *Tetradynmia Siliquosa*. Nat. Ord. *Siliquosa*, Linn. *Crucifera*, Juss.

Eff. Ch. Pod nearly cylindrical; valves concave, without rib or keel. Cotyledons accumbent. Calyx spreading.

N. officinale, (Sisymb. Nasturtium; Linn. &c.), with *lythostrate*, *terrestre*, *ambibium*, *pyrenaicum*, and *sagittatum*, are the species mentioned in Hort. Kew. We have already described all but *pyrenaicum*, which is a well-known species.

NATICK, *l. ult. r.* in 1810, contained 766.

NATRON. See MINERALOGY, *Addenda*.

NATUNZ, in *Geography*, a town of Persia, in the province of Irak, 63 miles from Ispahan, and 43 from Cashan, situated on a very delightful spot, in a valley surrounded by high and rugged mountains; and famous for the salubrity of its climate, pears, peaches, and handsome females. It has a fort in the centre of the valley, an excellent warm bath, and an old mosque, with a very handsome mineral, said to have been built 300 years ago.

NAVY. Add—having 56 inhabitants.

NAXIA, *l. 10* from bottom, after villages, add—Dr. Clarke (in vol. vi. of his Travels) states the whole population of the island, including women, at 18,000 persons, about 3000 of whom are Latins, and the rest Greeks.

NAZARETH, col. 2, at the clove, *l. 34*, add—Lower Nazareth is a township containing 758, and Upper Nazareth is a township in the same county and state, containing 535 inhabitants.

NEATH, col. 2, *l. 5, r. Saturday for Thursday*; *l. 6*, add—It has three fairs; *l. 12, r.* was for is.

NECYDALIS, MINOR, add—in fields and about hedges in the summer months. CÆRULEA, add—in woods during the summer months.

NEEDHAM, *l. 7, r. 1097*.

NEJIFF, or MESHEH ALI, a holy city, being the supposed burying-place of the caliph Ali, a town of the pachalic of Bagdad, nine furlongs from Hilleh, and four miles from Kufa, situated on a hill, at the bottom of which is an artificial lake. It was founded by Alexander the Great, and bore the name of Alexandria, which was afterwards changed into that of Hira, when it became the residence of a dynasty of Arabian princes, who fought under the Parthian banners against the emperors of Rome. Nejiff is not so large as Kerbela, but better built, and defended by a good wall, deep ditch, and lofty towers, lately renewed, under the apprehension of an attack from the Wahabees, who extend their ravages to the gates of the town. The tomb and mosque of Ali occupy an ample space in the middle of the city, and form a handsome structure, within a high wall, which an infidel subjects himself to death for attempting to pass. The governor of Meshed Ali is a Turk, but the population, not easily estimated on account of the constant influx of pilgrims, is like that of Kerbela, chiefly composed of Persian fanatics. The relics of almost all persons of rank are transported from the most remote parts of Persia to be interred either here, or at Kerbela, Kazameen, Koom, or Meshed in Khorassan.

NELSON, *l. 2, r. 13,257—2908*. Add—Also, a county of Virginia, containing 9684 inhabitants, of whom 4678 were slaves in 1810.

NEMESIA, in *Bolany*, a name borrowed by Ventenat from Dioscorides, who is said to have applied it to some kind of *Antirrhinum*, we know not in what part of his writings. The present genus is nearly allied to *Antirrhinum*.—Venten. Malmaif. 41. Ait. Hort. Kew. v. 4. 10.—Class and order, *Didynmia Angiosperma*. Nat. Ord. *Perfonate*, Linn. *Scrophularia*, Juss.

Eff. Ch. Calyx in five deep segments. Corolla spurred

at the base; throat cloyed by the palate. Capsule compressed, of two cells, and two boat-like valves; partition linear, covered with seeds.

1. *N. chamadrifolia*. Germander-leaved Nemesia. Vent. n. 3. Ait. 1. (*Antirrhinum macrocarpum*; Ait. ed. 1. v. 2. 335. Willd. Sp. Pl. v. 3. 249.)—Leaves ovate, serrated, stalked. Flowers on axillary stalks, solitary.—Native of the Cape of Good Hope. A perennial, herbaceous, smooth, green-house plant, flowering all summer. *Flowers* deep crimson.

2. *N. bicornis*. Horned Nemesia. Ait. n. 2. See ANTIRRHINUM, n. 24. (*Linaria*; Burm. Afr. 211. t. 75. f. 3.)—Leaves lanceolate, with tooth-like serratures. Cluster terminal, rather lax.—From the same country. Annual. The specific name applies to the *capsule*.

3. *N. fatens*. Fœtid Nemesia. Vent. n. 1. t. 41.—Leaves linear-lanceolate; upper ones entire. Clusters terminal, dense. Stem shrubby.—From the Cape. *Flowers* white, streaked with red; palate yellow.

4. *N. linearis*. Linear Nemesia. Vent. n. 2.—Leaves linear, entire, sessile. Clusters corymbose.—Described by Ventenat from Jussieu's herbarium.

NEPANESE, in *Geography*, a township of Lycoming county, in Pennsylvania, having 298 inhabitants.

NEPER, col. 1, *l. 22* from bottom, for *Neper's rods r. Neper's bones*.

NEPHELINE, or SOMMITE. See MINERALOGY, *Addenda*.

NEPHRITE. See MINERALOGY, *Addenda*.

NERANTEKA, in *Hindoo Mythology*, is the name of a malignant demon, mentioned often in their heroic poems, slain by Krishna, and by other divine warriors. The name generally means destroyer of men.

NERKA, one of the many hells of the Hindoos. See NARAKA.

NEROS, in *Chronology*, an ancient Chaldee period of 600 years, and equal to the Sofos of 60 years multiplied by 10.

NESENPACK, in *Geography*, a township of Luzerne county, containing 460 inhabitants.

NESHANSACK, a township of Mercer county, in Pennsylvania, having 700 inhabitants.

NETCHEZ, or western branch of the Sabine, a river of Louisiana, formed from the united streams of the Angelina, Attoquaque, Nena, and the Attascocito. The Netchez, though not so long as the Sabine, exceeds it as to quantity of water. The lands watered by this river, and its tributaries, are of superior quality to the country on the Sabine; but sterile compared with those on the margin of many rivers in Louisiana.

NETTING. Add—The *netting* is used in different parts of a ship; thus, the *boarding-netting* is thrown over the sides, to prevent the enemies boarding. *Bow-sprit-netting* is fastened near the outer end of the bowsprit, to the man-ropes or horses, to stow away the fore-topmast-stay-fail and jib. *Bread-work quarter and waist nettings* are used to keep the hammocks in the stantions. *Head-netting* is fastened to the horses in the head and upper rail, to prevent the men from slipping overboard. *Quarter-deck netting* is suspended over the officers' heads, to prevent any thing falling thereon. *Top-netting* is fastened to the rail, shrouds, and top, to preserve the men from falling.

NEWARK, in America, *l. 2*, add—having 88 inhabitants; *l. 12*, add—and in 1810 contained 8008 inhabitants, of whom 369 were slaves.

NEW BRAINTREE, *l. 2*, after Worcester, insert—Massachu-

—Massachusetts; l. 5, add—in 1810 contained 912 inhabitants.

NEWBURY, or NEWBERRY, l. 2, add—It contained, in 1810, 13,964 persons, of whom 4006 were slaves; l. 3, r. 1796; l. 10, r. 1363; l. 13, r. 5176.

NEWBURY PORT, l. 4, r. 7634.

NEW CANAAN, a town of Fairfield county, in Connecticut, containing 1599 persons.

NEWCASTLE, l. 5, r. 9 hundreds, and 24,429; l. 6, r. 1087; l. 16, add—It contained 2340 inhabitants, including 174 slaves; l. 19, r. 592; l. 26, r. 1232. At the close, add—Also, a township of Mulkingum county, in Ohio, having 370 persons.

NEWCASTLE-in-Emlyn, col. 2, l. 2, for Saturday r. Friday. Add—A few miles below the town is a beautiful falcon-leap.

NEW CHESTER. Add—containing 895 inhabitants.

NEW DURHAM, a town of Stafford county, in New Hampshire, having 888 inhabitants.

NEW FAIRFIELD, a town of Connecticut, in the county of Fairfield, having 772 inhabitants.

NEW-FANE, l. 3, r. 1276.

NEWFIELD, a town of Maine, in the county of York, with 815 inhabitants.

NEW GRANTHAM. Add—containing 864 inhabitants.

NEW HAMPSHIRE. Add—See UNITED STATES.

NEW HAMPTON, l. 4, add—and contains 1293 inhabitants.

NEW HARTFORD. Add—containing 1507 inhabitants.

NEW HAVEN, in America, l. 4, r. 18; l. 5, r. 1810; containing 37,064 persons. For other particulars, besides those which have been mentioned, see *NEW HAVEN*, and UNITED STATES.

NEWINGTON, l. 3, r. 508.

NEWINGTON, *Stoke*, a village of the county of Middlesex, in the Finbury division of Offulstone hundred, and parish of St. Mary's. In 1811 the parish contained 342 houses, and 2149 persons; viz. 890 males, and 1259 females.

NEW KENT, l. 3, r. 6478 inhabitants, of whom 3735 were slaves in 1810.

NEWLIN. Add—containing 780 inhabitants.

NEW LONDON, l. 4, r. 14; l. 6, r. 1810—34,707—77; l. 14, r. 3238; l. 26, r. 692. At the close, add—Also, a township of Pennsylvania, in Chester county, containing 1018 persons.

NEWMARKET, in America, l. 3, r. 1061. Col. 2, l. 1, add—Also, a township of Highland county, in Ohio, containing 978 inhabitants.

NEW MILFORD, l. 7, add—In 1810, the inhabitants were 3537. At the close, add—it has 797 inhabitants.

NEWPORT, in Cornwall. In 1811, the parish of St. Stephen's contained 159 houses, and 896 persons; viz. 433 males, and 463 females.

NEWPORT, col. 1, l. 4, r. 1427; l. 7, r. 16,294; l. 19, r. 7907. Col. 2, l. 9, add—containing 566 inhabitants. Add—Also, a township of Washington county, in Ohio, having 323 inhabitants.

NEWRY, a township of the district of Maine, in the county of Oxford, having 202 inhabitants.

NEWTON, l. 3, r. 1709; l. 5, add—Also, a township in Bucks county, having 902 inhabitants:—l. 8, r. 454; add—Also, a township of Delaware county, in Pennsylvania, containing 601 inhabitants.—Also, a township of Cumberland county, in the same state, having 1312 inhabitants.—Also, a township of Miami county, in Ohio, having 556

inhabitants.—Also, a township of Mulkingum county, in Ohio, having 802 inhabitants.—Also, a township of Trumbull county, in Ohio, having 490 inhabitants.

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NEWTON-NOTTAGE, a parish formed by the hamlets of Newton and Nottage, situated in the county of Glamorgan, near the Bristol Channel. In 1811, the former hamlet, at a small distance from Pyle, that lies in the road between Cowbridge and Neath, contained 55 houses, and 254 persons; viz. 117 males, and 137 females; and the latter contained 43 houses, and 217 persons; viz. 107 males, and 110 females.

NEWTOWN, l. 3, containing 2834 persons; l. 14, having 1951 inhabitants; l. 17, and 2082 persons; l. 25, add—See NEWTON; l. 27, add—See also NEWTON.

NEW VINEYARD, l. 1, for Kennebeck r. Somerset. Add—containing 484 inhabitants.

NEW YORK. See *NEW YORK*.

NIAGARA, l. 1, insert—a county, &c.; l. 2, add—the county including 8971 inhabitants.

NIBBED-HOOKS, in *Rope-making*, are iron winches used to hang the yarn on to harden, and to lay small ropes on.

NICHOLAS, l. 2, r. 4898 inhabitants, 509 being slaves.

NICKEL, in *Chemistry*. The weight of an atom of this metal, according to the recent determinations of Dr. Thomson, is 33.75, from which datum the composition of its salts may be easily ascertained. See *ATOMIC THEORY*.

At the end of the article in the *Cyclopædia*, add—From the experiments of Tuppiti, it appears that preparations of nickel possess poisonous properties.

NICKEL-Ore. See *MINERALOGY, Addenda*.

NICOTIN, in *Chemistry*, the name which has been given to a peculiar principle in the leaves of the *nicotiana glauca*, or *tabacco*, and to which that plant owes its peculiar properties. This substance was obtained by Vauquelin from the juice, by a process sufficiently complicated. When pure it is colourless. It has an acrid taste, and the peculiar smell which distinguishes tobacco. It occasions violent sneezing. It is soluble both in alcohol and water; the solutions are colourless, and distinguished by the peculiar taste and smell of nicotin. It is precipitated from its solutions by tincture of nutgalls. It is volatile, and somewhat resembles in short the volatile oils in its properties. It possesses poisonous properties. See further in the *Annales de Chemie*, lxxi. 139.

NIGER. Add—It has been supposed that the Niger terminates in the Nile; but this hypothesis, though maintained by several modern travellers, viz. Hornemann, Jackson, &c. is the most unfounded of any, and the least consistent with acknowledged facts. The supposition adopted by Mr. Park is, that the Niger terminates in the river Congo, or, as it is sometimes called, the *Zaire*; which see. Another supposition, respecting the termination of the Niger, is that of a German geographer, Mr. Reichard, published in the “*Ephemerides Geographiques*,” in August 1808, who represents the Niger, after reaching Wangara, as seeking a direction towards the south, and being joined by other rivers from that part of Africa, taking a great turn from thence towards the south-west, and pursuing its course until it approaches the north-eastern extremity of the gulf of Guinea, whence it divides and discharges itself by different channels into the Atlantic; after having formed a great Delta, of which the Rio del Rey constitutes the estuary of the Rio Formoso, and Benin river the western branch.

branch. Park's Travels, vol. ii. Appendix, N^o iv. p. clxxxiv.

NILA, in *Mythology*, is one of the many names of the Hindoo goddess Parvati. The word means blue or dark-azure, and is one of the Sanskrit names for the Nile, as is also Kali.

NILAKANT'HA, a name of the god Siva, meaning blue-throated, similar to Shitakantha, or Shitakoontha, under which word some account is given of the origin, &c. of the appellation.

NILE, in *Geography*, a town of Ohio, in the county of Scioto, having 396 inhabitants.

NIMMISHITHAN, a township of Ohio, in Stark county, having 385 inhabitants.

NIÖBE, in *Ancient Mythology*, was, according to the historians who acquiesce in the authority of Diodorus Siculus and Apollodorus, the daughter of Tantalus, and sister of Pelops. Pelops removing from Phrygia, carried his sister with him to that part of Greece which afterwards took his name; and for the security of his new dominions, married her to Amphion, a prince eminently powerful and eloquent, who fortified Thebes with walls. Niobe became, in consequence of that marriage, the mother of a numerous progeny; and was thus led to despise Latona, who in revenge induced Apollo and Diana to put all her children to death, in the manner related by Ovid and Plutarch. This episode, as it is said by some writers, contains a history no less true than tragical. The city of Thebes was desolated by a pestilence, which destroyed all Niobe's children; and as contagious distempers have been attributed to the immoderate heat of the sun, it was reported that Apollo slew them with his darts. Niobe, after the death of her children, and husband, who, overpowered with grief, destroyed himself, returned to Lydia, and ended her days near mount Sipylus, upon which was seen, according to Pausanias, a rock that, viewed at a distance, resembled a woman in deep melancholy and distress. Sophocles, in his Antigone, says, that this princess was not at first transformed into a stone; but that the gods, at her request, granted her that favour afterwards. The same poet, in his Electra, says, that Niobe sheds tears in a tomb of stone.

NIPPER, in *Rope-making*, is formed of two steel plates, through which the yarn passes from the tar-kettle, which are so adjusted by weights and a lever, that the yarn receives no more tar than is required, and what is squeezed out drops into a trough and returns into the kettle.

NIRRI'TI, is the name of a Hindoo deity, consort or *fakti* of Nirrit or Nairit. (See the latter article.) She shares with her husband the regency of the south-west quarter of the heavens.

NISHAPOUR, anciently the greatest and richest city of Khorassan in Persia, and one of the four royal cities of the province, is seated on a plain, formerly irrigated by about 12,000 aqueducts, which have fallen into decay. It is said to have been founded by Taimuras, and destroyed by Alexander the Great. After the lapse of many years, it was rebuilt by Sapor I., and his statue was seen in it till the Arabs destroyed it. This city was taken in the 548th year of the Hegira by the Tartars, who so completely ruined it, that when the original inhabitants returned to take possession of it, they could not distinguish their own houses. After having regained its former splendour, it was again taken and pillaged by the Tartars under Gengis Khan; so that the present inhabitants do not exceed the number of 15,000. The ruins of the city are nearly ten furlongs in circumference. It is at present

subject to the dominion of the king of Persia, and has nine districts dependent upon it, each of which has about ten walled villages. The fruits are abundant and delicious.

NITRE, *Native*. See MINERALOGY, *Addenda*.

NITRIC ACID, NITRATES, &c. in *Chemistry*. The correct proportions in which azote and oxygen combine, will be found in the tables appended to *ATOMIC THEORY*, to which therefore we refer our readers. We shall only state here the composition of nitric acid, which is 5 atoms oxygen + 1 atom azote: hence the weight of its atom is 67.5, from which datum the composition of the nitrates can be accurately determined.

NIVENIA, in *Botany*, a noble genus, dedicated by Mr. Brown to Mr. James Niven, an intelligent observer and collector of Cape plants, sent out by Mr. Hibbert.—Br. Tr. of Linn. Soc. v. 10. 133. Ait. Hort. Kew. v. 1. 201. (Paranomis; Salif. Parad. at p. 67.)—Clafs and order, *Tetrandria Monogynia*. Nat. Ord. *Protaceae*, Juss. Br.

Ess. Ch. Corolla four-leaf, regular. Anthers sunk in the concave tips of the segments. Nectary four scales. Stigma vertical. Nut superior. Involucrum of four leaves, containing four flowers; hardened when in fruit.

Ten species are described, all shrubs, natives of hills at the Cape of Good Hope. *Leaves* scattered, doubly pinnatifid, thread-shaped; the upper ones, in six of the species, undivided and flat. *Flowers* spiked, capitate, bracteated, purplish.—Four species are mentioned in Hort. Kew.

1. *N. Sceptrum*. (Protea Sceptrum; Linn. Suppl. 116. Sparm. Stockh. Transf. for 1777. 53, not 55, t. 1.)—Upper leaves obovate or lanceolate, flatthigh; simple at the edges. Corolla silky, with close hairs.

2. *N. spatulata*. (P. spatulata; Thunb. Prot. n. 58. t. 5.)—Upper leaves broader than long, hooded, bordered. Involucrum obtuse. Corolla bearded. Style smooth. Stigma oblong-clubshaped.

3. *N. spicata*, and 4. *N. crithmifolia*, the latter P. Lagopus; Andr. Repof. t. 243, have all the *leaves* doubly pinnatifid.

NOBLEBOROUGH, l. 3, r. 1206.

NOCK, the foremost upper corner of boomfalls, and of stayfalls cut with a square tack.

NOCKAMIXON, l. 2, r. 1209.

NOCTURN, LITURGIC, the divine office of the night, as distinguished from that of the day. The latter consisted of the seven canonical hours, the former of three nocturns, each consisting of several psalms, lessons, &c.; and it was heretofore customary to interrupt the sleep three different times for the performance of them.

NOOTH'S APPARATUS. See LABORATORY.

NORFOLK, col. 2, l. 15, add—By the parliamentary returns in 1811, this county contained 33 hundreds, 3 boroughs, *viz.* King's Lynn, Thetford, and Great Yarmouth, and one city, *viz.* Norwich; 51,774 houses, occupied by 291,999 persons; 138,089 being males, and 153,910 females: of whom 31,454 families are employed in agriculture, and 23,082 in trade and manufactures.

NORFOLK, in America, l. 4, r. 22; l. 6, r. 31,245; l. 8, r. 18,679—5647; l. 4 from bottom, r. 1441.

NORMAN. Add—Also, a square sid of oak, or short carling, fixed through the head of the rudder of East India ships, to prevent the loss of the rudder, in case of its being unshipped. Also, a short wooden bar with a head, used in one of the holes of the windlafs when there is little strain on the cable.

NORRIDGEWOCK, l. 2, add—and county of Somerset; l. 3, r. 880.

NORTH BEAVER. See BEAVER.

NORTH-

NORTH-*West Fort*, a hundred of Suffex county, in the state of Delaware, containing 3293 persons, of whom 382 were slaves in 1810.

NORTH-*West Passage*, l. 15, after Labrador coast, add—nor of the Cortelears of Portugal in 1500, nor of the Cartiers and others from France in 1508 and 1534; nor of Gomez, &c. from Spain in 1524, &c.; nor of sir Hugh Willoughby in 1553, of Richard Chancellor and Steven Burrough in 1555 and 1556:—l. 19, such as Edward Fenton in 1577, Arthur Pet and Charles Jenkinson in 1580, sir Humphry Gilbert in 1583, John Davis in 1585, 1586, and 1587, Cornelis Cornelison, Brands Ysbrants, and William Barentz of the United Provinces, in 1594, of Barentz in 1595 and 1596, William Adams in 1596, George Weymouth in 1602, James Hall in 1605–6–7, John Knight in 1606, Henry Hudson in 1607–8–9–10, sir Thomas Batten in 1612, James Hall in 1612, Gibbons in 1614, Robert Bylot in 1615, Bylot and William Baffin in 1616, Jens Mank, a Dane, in 1619:—l. 41, and, after the failure of Samuel Hearne in 1760, 1770, Constantine John Phipps (lord Mulgrave) in 1770, captain Cook, &c. Col. 2, l. 39, add—our limits will not allow our detailing the voyages of captain (now admiral) Lowenorn, lieutenant Egéde, and lieutenant Rothé, Danes, in 1786 and 1787, nor the travels of Alexander Mackenzie in 1789, nor those of Charles Duncan in 1790 and 1791, nor the discoveries made by the Ruffians on the northern coast of Siberia during the 18th century, nor the voyages for farther discovery, undertaken in the early part of the 19th century by lieutenant Kotzebue 1815 to 1818, of John Ross, David Buchan, William Edward Parry, and John Franklin in 1818. Add to the references—Barrow's Chronological History of Voyages into the Arctic Regions, &c. 8vo. London, 1818.

NORTHAMPTON, col. 9, l. 7, for 1623 r. 1576.

NORTHAMPTON, in America, l. 4, r. 32—38, 145; l. 5, r. 1176; l. 8, r. 710; l. 10, r. 13,082; l. 11, r. 7258; l. 17, r. 7474; l. 18, r. 3350. Col. 2, l. 2, r. 2631. Add at the close—In 1810 it contained 4171 inhabitants.

NORTHAMPTONSHIRE, l. 24, r. 28,318. Add—68,279 being males, and 73,074 females, of whom 12,100 families were employed in trade and manufactures, and 15,235 in agriculture.

NORTHBOROUGH, l. 3, r. 794.

NORTHBRIDGE, l. 3, r. 713.

NORTHFIELD, l. 3, r. 426; l. 6, r. 1218; l. 10, r. 1057.

NORTH HAMPTON, l. 2, r. 651.

NORTH HAVEN, l. 4, r. 1239.

NORTH HERO. See HERO.

NORTH KINGSTOWN, l. 5, r. 2957; l. 6, r. 7 slaves in 1810.

NORTH PORT, l. 2, r. 780.

NORTH STANNINGTON, a township of New London county, in Connecticut, having 2524 persons.

NORTHUMBERLAND, in America, l. 1, for Graf-ton r. Coos; l. 4, r. 281; l. 7, r. 26, r. 36,327; l. 15, r. 8308 inhabitants, of whom 3847 were slaves in 1810.

NORTHWOOD, l. 5, r. 1095.

NORTH YARMOUTH, l. 5, r. 3295.

NORTON, l. 3, r. 1598.

NORWALK, col. 2, l. 1, r. 2983.

NORWAY, l. 3, r. Oxford; l. 4, r. 1010.

NORWEGAN, a township of Berks county, in Pennsylvania, having 415 inhabitants.

NORWICH, col. 7, l. 39, add—By the parliamentary returns in 1811, the city of Norwich contained 8336 houses, occupied by 37,256 persons; the males being 15,664, and the females 21,592: of whom 8410 families were employed in trade, manufactures, and handicraft, and 388 in agriculture.

NORWICH, in America, l. 3, r. 1812; l. 5, r. 968; l. 17, r. 2976 inhabitants. Norwich, except the city, contains 552 inhabitants.

NOTOCERAS, in *Botany*, from *notos*, the back, and *ceras*, a horn.—Brown in Ait. Hort. Kew. v. 4. 117.—Clas and order, *Tetradynamia Siliquosa*. Nat. Ord. *Siliquose*, Linn. *Crucifera*, Juss.

Est. Ch. Valves of the pod horned at the back, near the top. Cotyledons accumbent. Stigma capitate. Calyx nearly erect, equal at the base.

1. *N. canariensis*. Canary Horn-crefs. Ait. n. 1. (Erysimum bicorne; Ait. ed. 1. v. 2. 394. Willd. Sp. Pl. v. 3. 514.)—Brought by Mr. Masson, from the Canary islands. A small, branched, annual plant, covered with clove bristles; the leaves lanceolate, entire; flowers yellow, minute.

NOTTINGHAM, in America, l. 3, r. 1063; l. 6, r. containing 2615 inhabitants. Add—Also, a township of Washington county, in Pennsylvania, having 2037 inhabitants.—Also, a township of Ohio, in Tuscarawa county, having 452 inhabitants. Col. 2, l. 2, r. 1376.

NOTTINGHAMSHIRE, l. 16, r. 31,344; l. 17, after number, add—the males being 79,037, and females 83,843.

NOTTOWAY, a county of Virginia, containing 9273 inhabitants, of whom, in 1810, 6368 were slaves.

NUMBERS, col. 2, l. 2, after “and $\frac{220}{2}$ + infert

“ $\frac{220}{4}$ +.” Col. 18, &c. $x^d - x$.

NUMBERS, *Planetary*, col. 5, l. 10, for $25^d 24^h 8^m$ r. $25^d 14^h 8^m$. Col. 6, l. 17 from bottom, for successful r. successfulive. Col. 21, l. 26, for $\frac{2064}{4355}$ r. $\frac{2064}{3355}$.

NUX VOMICA, *Chemical Properties of*. MM. Pelletier and Caventou, in analysing the nux vomica and St. Ignatius's bean, observed a new vegetable alkaline substance, having the following properties.

It is slightly soluble in water, very soluble in alcohol, restores the colour of turnsole after it has been reddened with an acid, does not redden turmeric, combines with acids which it saturates, and forms with them crystallizable salts. The discoverers have suggested the name *Vauqueline* for this substance, in honour of the celebrated chemist Vauquelin, who is said to have first discovered the alkaline properties of a substance obtained by him from the *daphne alpina*.

NYCTERIUM, in *Botany*, a genus entirely artificial, made by Ventenat in Hort. Malmal. 85, out of such species of **SOLANUM**, (see that article,) as have irregular flowers.—Sims in Curt. Mag. 1801.—M. Dunal has very judiciously, as we presume to think, kept *Solanum* entire.

O.

O I L

OAKHAM, in America, l. 3, r. 848.

OBSIDIAN. See MINERALOGY, *Addenda*.

OCATAHOOTA, in *Geography*, a parish of New Orleans, in Louisiana, resembling in its soil and produce *Ouachitta*; which see.

OCTOMERIA, in *Botany*, *οκτώ*, eight, and *μερί*, a portion, or supply, because of the eight masses of pollen.—Brown in *Ait. Hort. Kew.* v. 5, 211.—Class and order, *Gynandria Monandria*. Nat. Ord. *Orchideæ*.

Fl. Ch. Lip articulated with a kind of claw which bears the petals. Anther a moveable deciduous lid. Masses of pollen eight.

We know not of how many species this genus is composed. One only occurs in *Hort. Kew*.

1. *O. graminifolia*. Grass-leaved *Octomeria*. *Ait. n. l.* (*Dendrobium graminifolium*; *Willd. Sp. Pl.* v. 4, 135. *Epidendrum graminifolium*; *Linn. Sp. Pl.* 1353. *Helleborine graminea repens biflora*; *Plum. Ic.* 171. t. 176. f. 1.)—Stem elongated, bearing one lanceolate leaf, and a pair of stalked flowers. Root creeping.—Native of the West Indies; imported by rear admiral Bligh; in 1793. Few botanists have gathered or examined this plant. Burmann, without much sagacity, thought it a *Convallaria*.

OGHAM, col. 3, l. 30, for *Dfxtfrt r. Dfxtfrb*, and for *bfndfktb r. bfndfktb*.

OGLETHORPE, l. 3, containing, with its town Lexington, 12,297 inhabitants, of whom the slaves in the county are 5322, and in the town 113.

OHIO, l. 8, add—Bradbury, in his "Travels," estimates the area of the Ohio state at 43,860 square miles, and its population at 230,760 souls; so that by this statement there was, in 1810, only one inhabitant in one and a half square mile, and allowing 640 acres to the square mile, one inhabitant in every 900 acres. At the close, add—For a later and more correct account of the number of counties and amount of population in this state, see UNITED STATES. Col. 5, l. 3 from bottom, add—This river derives its waters from an area of 198,464 square miles, four times the extent of England and Wales, the surface of which is supposed to be 49,450 square miles, and comprehended between the parallels of 35 and 43 degrees of latitude.

OHIO, county of Virginia, l. 4, r. 8175 inhabitants, of whom 440 were slaves in 1810; l. 6, r. 3682; l. 7, r. 497. Add—Also, a township of Alleghany county, in Pennsylvania, having 832 inhabitants.—Also, a township of Beaver county, in Pennsylvania, having 1128 inhabitants.—Also, a town of Ohio, in the county of Clermont, having 1803 inhabitants.—Also, a town of Gallia county, in Ohio, having 350 persons.—Also, a township of Knox county, in Indiana territory.

OIL of Caraway, l. 1, for *CARUA r. CARUM*.

O P A

OIL Creek. Add—Also, a township of Crawford county, in Pennsylvania, having 340 inhabitants.

OLEA, l. 4 from bottom, for *Calyx r. Corolla*.

OLEFIANT GAS, *Chemical Composition of*. See **ATOMIC Theory** and **CARBON**.

OLEIC ACID, in *Chemistry*, obtained by Chevreul from a soap made by digesting hog's-lard in potash ley. When this soap is put into water, a portion was deposited in pearl-coloured scales, which was the *margarate of potash*. (See **MARGARIC Acid**.) Another portion, consisting of the *oleate of potash*, mixed with some *margarate of potash*, remained in solution. These two were then separated, and the oleic acid obtained in a state of purity. Oleic acid when pure is an oily fluid, without taste or smell. But most commonly it has a rancid odour, and a yellow or brown colour, somewhat resembling olive-oil. Its specific gravity is .899. Sometimes it remains liquid at 35°, though other varieties of it congeal at 43°, or even higher. When congealed it crystallizes in needles. It reddens litmus with great energy. It is insoluble in water, but very soluble in alcohol. It combines readily with the alkalies and earths, forming salts, or rather soaps, none of which possess very remarkable properties. Dr. Thomson, from Chevreul's experiments, estimates the weight of its atom at 360. It may be obtained from most other animal fats as well as hog's-lard.

OLEY, in *Geography*, a township of Berks county, in Pennsylvania, having 1284 inhabitants.

OLIVINE. See **OLIVINE**, and **MINERALOGY**, *Addenda*.

O'M, col. 5, l. 31, for *researches r. researchers*; l. 42, *r. monosyllabic*; l. 4 from bottom, *dele of*, and *r. one of their*. Col. 6, l. 24, *r. composed of a, &c.*

ONELEG, in *Geography*, a township of Ohio, in Tuscarawa, having 610 inhabitants.

ONONDAGO, l. 16, r. 25,987, of whom, in 1810, 50 were slaves.

ONSLow, l. 3, r. 6669—2299.

ONTARIO, l. 3, number of inhabitants in 1810 was 43,032, of whom 212 were slaves.

OPETHUS, **TOURACO**, in *Ornithology*, a genus of birds of the order of *Picæ*; the characters of which are, beak short, convex above, rather bent, compressed laterally, and denticulated from the middle to the tip; nostrils covered with short silky feathers; feet simple, with two toes before and two behind. One species of this genus is known, which is a native of Africa, and one of the most beautiful of the birds that are found in that quarter of the globe. It feeds on fruits, is easily tamed, and capable, as it is said, of turning its exterior hinder toe either backwards or forwards. This is the *CUCULUS Parra* of the Linnæan system. Shaw.

OPAL. See **MINERALOGY**, *Addenda*.

OPELOUSAS,

OPELOUSAS, in *Geography*, a county and parish of the territory of Orleans, containing, in 1810, 5048 inhabitants. This territory presents a great variety of soil, or, if we except the sugar-cane and orange-tree, the cultivation of most valuable vegetables has succeeded. Cotton, indigo, and tobacco, have been and the former now is the staple commodity of the country; to which we may add, cattle, hides, leather, cheefe, beef, and pork.

OPHIDIUM, l. 25, add.—See Dr. Brouffonnet's description of this fish in the Phil. Transf. vol. lxxi.

OPHIOPOGON, in *Botany*, from $\sigma\phi\iota\varsigma$, a *serpent*, and $\pi\omega\gamma\omega\nu$, a *beard*, a translation of the Japanese name, *Riuno Fige*, but the application is not very evident.—Ker in Curt. Mag. 1063. Ait. Hort. Kew. v. 2. 281.—Clafs and order, *Hexandria Monogynia*. Nat. Ord. *Sarmentacee*, Linn. *Asparagi*, Juss.

Eff. Ch. Corolla half superior, permanent. Anthers sessile. Stigma simple. Berry with one seed.

1. *O. japonicus*. Japan Snake's-beard. Curt. Mag. t. 1063. (Convallaria japonica; Linn. Suppl. 204. Redout. Lil. t. 80. Mondo; Kämpf. Am. Exot. 823. t. 824.)—Native of Japan, where it serves as edgings in flower-gardens. A hardy grassy plant, with clusters of greenish-white flowers, and blue berries. The knobs of the root candied, are esteemed medicinal.

OPIUM, *Chemical Properties of*. M. Derofne, in 1803, published an analysis of opium, in which he announced the existence of a peculiar crytallizable substance to which that drug owes its narcotic properties, whence it was named the *NARCOTIC Principle* (which see). Soon afterwards, M. Sertürner published an analysis of the same substance, but the results of the two chemists were so different, as to render both doubtful. This latter chemist, however, pursued the subject, and at length succeeded in separating a peculiar substance from opium, which he denominated *morphia*. It is to this principle that opium owes its narcotic properties; and the *narcotic principle* of Derofne, according to Sertürner, is a compound of morphia, and a peculiar acid called the *meconic*, which opium contains. This latter circumstance, however, has been since called in question by Robiquet.

According to Sertürner, morphia occurs in opium combined with meconic acid. There are different methods of separating morphia from opium. Sertürner effected it by adding acetic acid, and thus forming an impure acetate of morphia. The acetic acid was then separated by ammonia, and the morphia thus obtained purified by means of alcohol. Others, after separating the extraneous matter as much as possible, add at once to the watery solution of opium pure ammonia, to precipitate the morphia, which is to be purified as before.

Morphia thus obtained is crytallized in the form of double four-sided pyramids, whose bases are squares or rectangles, and sometimes of four-sided prisms with trapezoidal bases. It dissolves in eighty-two times its weight of boiling water, and the solution on cooling deposits regular colourless transparent crytals. It is soluble in thirty-six times its weight of boiling alcohol, in forty-two times its weight of cold alcohol, and in eight times its weight of sulphuric ether. All these solutions change the infusion of Brazil wood to violet, and the tincture of rhubarb to brown, thus denoting distinct alkaline properties. They have a bitter and peculiar atringent taste; and the saturated solutions, when rubbed upon the skin, leave a red mark. It acts with great energy on the animal economy. Half a grain being swallowed by a young man of seventeen, produced a flushing in the face and an augmentation of the muscular

energy; another half grain being swallowed half an hour afterwards, occasioned a dull pain in the head, giddiness, stupor, and nausea. A third half grain aggravated the symptoms so much, that Sertürner became alarmed, and made his patient swallow a quantity of vinegar. But the symptoms were rather aggravated and continued all night, though they were removed next morning by the use of magnesia.

Morphia readily combines with the different acids, neutralizes them, and thus forms salts, of the properties of which the following is a brief summary. The carbonate of morphia crytallizes in short prisms. The acetate of morphia crytallizes, but is very soluble in water. The sulphate of morphia is likewise very soluble. The muriate of morphia assumes a plumose appearance, and is much less soluble than any of the other salts of morphia. The nitrate of morphia crytallizes in prisms.

Dr. Thomson estimates the weight of the atom of morphia, from the experiments of Choulant, at 82.5; but this probably differs considerably from the truth.

Meconic Acid.—This acid may be obtained from the infusion after the morphia has been separated by ammonia as above-mentioned, by adding muriate of barytes as long as any precipitate falls, which is *meconiate of barytes*. To obtain the meconic acid from this salt, M. Choulant triturated it in a mortar with its own weight of glassy boracic acid. This mixture being put into a small glass flask exposed gradually to heat in a sand-bath, the meconic acid sublimed in the state of fine white scales or plates.

Meconic acid thus obtained has a strong sour taste, which leaves behind it an impression of bitterness. It is readily soluble in water, alcohol, and ether. It reddens the greater number of vegetable blues, and changes the solution of iron to a *cherry-red* colour; when these solutions are heated, the iron is precipitated in the state of protoxyd. This acid unites with the different bases forming *meconiates*. The *meconiate of potash* crytallizes in four-sided tables, and is soluble in twice its weight of water. The *meconiate of soda* crytallizes in soft prisms, and is soluble in five times its weight of water. It seems to effloresce. The *meconiate of ammonia* crytallizes in star-form needles, which when sublimed lose their water of crytallization, and assume the form of scales. The *meconiate of lime* crytallizes in prisms, and is soluble in eight times its weight of water. Dr. Thomson estimates the weight of the atoms of this acid, from the experiments of Choulant, at 27.5; but this can only be considered as an approximation.

Such is a brief account of the principles which chemists have lately detected in opium, and which, from the importance of the subject, we have thought proper to insert here.

ORANGE, l. 2, r. 25, 247. Col. 2, l. 4, r. 1686; l. 7, r. 229; l. 11, r. 764; l. 13, r. 343, 347; l. 14, r. 966; l. 22.—The number of inhabitants in 1810 was 2266, including 48 slaves; l. 27, r. 12, 323 inhabitants, of whom 6516 were slaves in 1810.

ORANGEBURG, l. 6, r. 13, 229—6564.

ORES, *Chemical Analysis of*. See ANALYSIS.

ORFA, in *Geography*, the present name of the ancient *Edessa* (which see), from which the pachalic of Orfa derives its appellation. This pachalic is almost entirely encircled by the windings of the Euphrates and the river Khabour, and occupies a considerable portion of the most barren part of Mesopotamia. In the early ages of the Roman empire, this division of Mesopotamia bore the name of Orshoene. It had subsisted 843 years as an independent kingdom, when it was reduced under the form of a province by Caracalla, who led Abgarus, the last of its kings, in chains

chains to Rome. The city of this name, after the expulsion of the princes of Ofrhoene, became a Roman colony, and was regarded as one of the bulwarks of Mesopotamia against the Parthians and Persians. It was the residence of the Courtneys, counts of Edeffa; and fell, together with the adjoining territory, into the hands of Zingi and Sallahadeen. In the thirteenth century it was sacked by the Moguls, and by Timur in the 80th year of the Hegira. It is now subject to the grand feignior, and the residence of a pacha of two tails. It is situated in a barren country, 232 miles from Diarbekr, surrounded by a stone-wall, defended by a citadel, and a broad deep ditch. The houses are well built, and the inhabitants, composed of Turks, Arabs, Armenians, Jews, and Nestorians, amount to about 20,000 souls. The chief ornaments of the city are, a magnificent mosque, consecrated to Abraham, and the cathedral of the Armenians, now fallen to decay. On an adjoining mountain are the ruins of a building, called the palace of Nimrod, and several extraordinary subterraneous apartments, apparently very ancient. M'Kinneir's Persia.

ORFORD, l. 4, r. 123.

ORGAN, col. 8, l. 12 from bottom, r. thoroughly repaired.

ORLAND. Add—It contains 480 inhabitants.

ORLANDO. See LASSUS.

ORLEANS, l. 4, r. 23; l. 10, r. 5830; l. ult. and in 1810 of 1248 persons.

ORLEANS, *New*, l. 3, insert 105 miles, &c.; l. 3, add— or, by the statement of Mr. Darby, N. lat. 28° 57'. W. long. 90° 8'. At the close, add—By the census of 1810, it is stated as comprising the following counties; *viz.* Orleans, German Coast, Acadia, La Fourche, Iberville, Point Coupee, Concordia, Ouachitta, Rapides, Natchitoches, Opelousas, and Arkansas, which include a number of parishes, and a population of 76,556 souls. The city and suburbs of New Orleans contained 17,242, and its precincts 7310: the number of slaves in the former is stated at 5961, in the latter at 4863. Since the census of 1810, there has been a rapid increase of population. Mr. Darby, in his "Description of Louisiana," published in 1816, states, that 1000 may be added for the annual increase, so that the present population may be estimated at more than 23,242 persons. No city perhaps on the globe, he says, presents a greater contrast of national manners, language, and complexion, than New Orleans. The proportion between the whites and men of mixed cast or black is nearly equal. Among the whites, the French are hitherto most numerous and wealthy; next to these are the Anglo-Americans; and lastly, the natives of the British islands. Here are but few Spaniards and Portuguese, some Indians, and dispersed individuals of all the nations of Europe. For a further account, see UNITED STATES.

ORNITHIDIUM, in *Botany*, from *ornis*, a bird, and *idion*, shape, or appearance.—Salis. Tr. of Hort. Soc. v. 1. 293. Brown in Ait. Hort. Kew. v. 5. 210.—Clafs and order, *Gynandria Monandria*. Nat. Ord. *Orchideae*.

Eff. Ch. Lip sessile, hooded, united to the base of the column. Calyx and petals converging. Anther a moveable deciduous lid. Masses of pollen four, oblique, furrowed behind.

1. *O. coccineum*. Scarlet-flowered Ornithidium. Ait. n. l. (*Cymbidium coccineum*; Swartz Act. Nov. Upf. v. 6. 70. Willd. Sp. Pl. v. 4. 94. Curt. Mag. t. 1437. Epidendrum coccineum; Linn. Sp. Pl. 1348. Jacq. Amer. 222. t. 135. Helleborine coccinea multiflora; Plum. Ic. 175. t. 180. f. 1.)—Native of the West Indies. Cultivated in a stove, among rotten bark, and flowering in

June. The leaves are lanceolate, coriaceous, each proceeding from a bulb. Flowers scarlet, not large, each on a simple, axillary, scaly stalk, much shorter than the leaves.

ORONO. Add—The township in the district of Maine, and county of Hancock, has 351 inhabitants.

ORRERY, col. 28, l. 17, for taken from r. taken for. Col. 42, l. ult. for under r. over. Col. 44, l. 9, for lays r. lies.

OSAGES. Add—See WASASHA.

OSMAZOME, in *Chemistry*. See BLOOD and FLUIDS, *Animal*.

OSRINGTON, l. ult. r. 1341.

OSNABURG, a township of Ohio, in Stark county, having 301 inhabitants.

OSSIPEE, l. 2, r. Strafford; l. 4, r. 1205.

OSSIPEE Gore, a township of the same state and county, having 125 persons.

OTAHEITE, l. 6 from the end, add—From a survey made by captain Wilson in this voyage, he estimates the whole number as not exceeding 16,050 persons; and Turibull, in his "Voyage round the World," performed from 1800 to 1804, says, that they cannot now be estimated at more than 5000.

OTALGIA, derived from *ous*, the ear, and *algos*, pain, signifies the disorder, which, in plain English, is generally called the ear-ache. The pain may be confined to one ear, or affect both these organs with different degrees of severity. It may be either of a burning, shooting, pricking, piercing, throbbing, or gnawing description; or it may consist of an unpleasant sensation of whispering in the ear, of a ringing of bells (see *Tinnitus Aurium*), a continual humming noise, &c.; the complaint in such instances usually depending upon irritation of the nerves of the organ.

According to the nature and situation of the disease, the pain may affect either the outer part of the ear, the meatus auditorius externus, the cheeks and temples, or the internal parts of the organ, the cavity of the tympanum, the labyrinth, and the auditory nerve itself. Otalgia is divided into several species, which are determined by the nature of their particular causes. Callisen mentions five varieties of the disorder; *viz.* the *otalgia inflammatoria, catarrhalis, purulenta, metastatica*, (a case which the modern doctrines in pathology hardly allow us to admit), and the *otalgia a corporibus alienis intrusis*.

The inflammatory form of the complaint, when seated in the external parts, is indicated by the common symptoms of inflammation, as heat, swelling, and redness, extending over the lobe of the ear, and the adjoining part of the cheek, attended with a diminution in the diameter of the meatus auditorius, and a consequent dulness in the power of hearing. But when the inflammation is seated in the internal ear, it is accompanied with acute fever, excruciating pain in the deeper part of the organ, exquisite sensibility to the slightest noise, intolerance of sounds, restlessness, sometimes a great deal of delirium, convulsions, syncope, coldness of the extremities, and, according to the accounts of several respectable writers, the disease may even have a fatal termination.

The *otalgia catarrhalis* is preceded by the usual symptoms of a cold, which is very frequently the consequence of an exposure of the head to a current of wind, or of the feet to damp, at a period when they are much heated. This ear-ache is commonly characterized by much milder symptoms than other varieties of the complaint; the swelling of the parts about the ear is not considerable; the nose discharges a vast quantity of mucus; the patient is troubled with cough and tooth-ache; and not unfrequently an enlargement

enlargement of the neighbouring glands is conjoined with the catarrhal swelling of the fauces.

The inflammatory otalgia sometimes terminates in the formation of an abscess, which may be superficial, being then sufficiently manifest from the presence of the ordinary symptoms of a cutaneous collection of matter. In this case, the fever and pain abate as soon as the abscess is opened, or has spontaneously burst, and the pus has been discharged. In other examples, the matter forms more deeply in the cavity of the tympanum, and it either makes its way outward by ulceration of the membrana tympani, or, in a more favourable way, through the Eustachian tube. When the abscess occupies a still deeper situation, that is to say, when the matter collects in the labyrinth, a necrosis of the bones often follows, the abscess either discharging itself into the cavity of the tympanum, or becoming diffused under the pericranium.

The *otalgia cariiosa* may originate from a caries, or rather a necrosis of the temporal bone, or, sympathetically, from a caries of one of the teeth. As the communicating branches of the facial nerve are affected, we see very paralysis of the muscles of the face is a frequent concomitant of this species of otalgia.

The *otalgia from extraneous substances in the ear*, as masses of hardened cerumen, insects, the lodgment of any small body, like a pea, &c. may be suspected from the account which the patient will give of his case; but it may be clearly ascertained by examining the state of the meatus auditorius in a strong light, and by the use of a probe. An obstruction or compression of the Eustachian tube may also become a cause of otalgia, as Callisen asserts, by confining fluids in the tympanum.

From what has been stated, it is obvious that although otalgia may indeed sometimes be an *idiopathic* disorder, it is most commonly only *symptomatic*, in which last circumstance it necessarily requires for its relief the same means which are proper for the cure of the primary disease, of which it is merely the effect.

In otalgia, the prognosis generally differs according to the seat of the disease, its nature and violence, and the ease or difficulty of removing the cause. The following circumstances relative to the prognosis seem to deserve remark.

Young persons usually suffer much more severely from ear-ache than older subjects, and experience more serious degrees of indisposition from the complaint. The internal inflammatory otalgia which produces suppuration affects the trunk of the auditory nerve itself, and discharges its matter within the cranium, may destroy the patient in a few days, if we are to credit the observations of Callisen. A subsidence of the inflammation, as indicated by a remission of the fever and pain, and a speedy evacuation of the matter by the rupture of the abscess, are events which augur a favourable termination of the disorder. When suppuration has occurred in the cavity of the ear, and the abscess uncomplicated with any carious affection has burst and discharged itself through the meatus auditorius externus, the disorder may prove no more dangerous than any other simple abscess. For the most part, after every severe attack of otalgia a degree of deafness remains, and this happens with still greater certainty when the case has been attended with suppuration.

The treatment of the various forms of ear-ache must of course depend upon the nature of the causes of the disorder. In general, however, if inflammation exist in the organ, it is to be opposed by the active employment of antiphlogistic remedies, especially topical bleeding with leeches, venesection, gentle purgatives, and anodyne fomentations. When

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matter is collected, the bursting of the abscess should be accelerated with emollient applications, or an opening should be made with a lancet. In such circumstances, the ear should be frequently cleaned by means of injections, which, generally speaking, ought to be of a simple un-irritating kind. Foreign bodies must be extracted. A morbid sensibility in the nerves of the ear must be lessened by suitable internal and external remedies, the use of opium, anodyne fomentations, the exhibition of conium or stramonium, the introduction of a doffel of soft cotton into the meatus auditorius, dipt in a mixture of olive-oil and laudanum, or the tinctura camphoræ, a perpetual blister in the vicinity of the ear, &c.

OTIS, in *Geography*, a town of Berkshire county, in Massachusetts, containing 1111 inhabitants.

OTSEGO, l. 6, r. 38,802 inhabitants, of whom 74 are slaves.

OUACHITTA, a county and parish of the territory of Orleans, which, in 1810, contained 1077 inhabitants. The staples of this territory are, cotton, tobacco, lumber, and peltries. Ouachitta river is not navigable in autumn, when the waters are low, for any vessels above the size of canoes.

OVERTON. Add—Also, a county of West Tennessee, containing 5643 inhabitants, of whom 355 are slaves.

OUGEIN, col. 6, l. 39, for here r. yet.

OUNDLE. In 1811, the parish of Oundle contained 362 houses, and 1833 persons; 821 males, and 1012 females; 62 families being employed in agriculture, and 302 in trade, manufactures, and handicraft.

OWHYHEE, col. 2, l. 18. Its height is estimated at no less than 18,400 feet.

OXALIC ACID, in *Chemistry*. The last analysis of this acid is by Berzelius. According to him, it is composed of

Hydrogen	-	-	-	-	.244
Carbon	-	-	-	-	33.222
Oxygen	-	-	-	-	66.534

100

which nearly correspond with $\frac{1}{7}$ th atom hydrogen + 2 atoms carbon + 3 atoms oxygen. But there are some doubts if even this determination be correct.

OXFORD, in America, l. 3, r. 1277; l. 5, r. 1453. Col. 2, l. 5, r. 1810, 2470 inhabitants, including 36 slaves; l. 6, r. 973; l. 15, r. 700 inhabitants; and another, called Lower Oxford, with 769 inhabitants.—Also, a township of Ohio, in Guernsey county, having 440 persons.—Also, a township of Ohio, in Tufcarawa county, having 271 inhabitants.

OXYGEN GAS, in *Chemistry*. According to the most recent determinations, the specific gravity of this gas is 1.111; and 100 cubic inches of it, at a mean temperature and pressure, will weigh 33.888 grains. See *ATOMIC THEORY*.

OXYGENIZED ACIDS. M. Thenard has recently been enabled to combine oxygen with acids almost to an unlimited extent, chiefly by means of the peroxyd of barium. His general method was, to dissolve the peroxyd in the acid intended to be oxygenized, and afterwards to separate the barytes by means of sulphuric acid; the oxygen was thus transferred from the peroxyd of barium to the acid, and by repeating the operation he found that additional doses could be added. In this way, he oxygenized the nitric, muriatic, phosphoric, and other acids, and by taking advantage of its other properties, the muriatic acid in particular was oxygenized, even so far as to contain 64 atoms

of oxygen to 1 of muriatic acid. These oxygenized acids combine with the different bases, and neutralize them; but they are by no means permanent, readily giving off their superfluous oxygen upon the application of heat, &c. The oxygenized muriatic acid also is decomposed by the oxyd of silver, chloride of silver is formed, and the oxygen is set at liberty.

By similar methods, M. Thenard has been able to combine additional doses of oxygen with many of the metallic oxyds. See *Annales de Chimie et Physique*, vols. viii. and ix.

OXYMURIATIC ACID. See CHLORINE.

OXYPRUSSIC ACID. See CYANOGEN and PRUSSIC Acid.

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PACKERSFIELD, l. 3, r. 1076.

PACOLET. Add—Also, a town of Rutland county, in Vermont, containing 2233 inhabitants.

PADMA, l. 2, *dele* of.

PAINT, in *Geography*, a township of Fayette county, in Ohio, having 534 persons.—Also, a township of Highland county, in Ohio, with 775 inhabitants.

PAINTING in *Enamel*. Of all the various mediums of painting none is so durable as enamel, since time, which destroys all other things, alters neither its beauty nor its brilliancy; and that this great advantage may not be too easily attained, it may be said, also, that no other method of painting unites in itself so many difficulties in the execution.

Enamel painting differs from every other kind of painting, in employing, as a vehicle for the colours, glass or some vitreous body, to hold the parts together, and fix them to the ground on which they are laid. This being mixed with the colours, and fused or melted by means of heat, becomes fluid; and having incorporated with the colours, forms together with them a hard shining mass. This vitreous body, called flux, is to an enamel picture what oil, gum, or varnish, is in the other modes of painting, as by its means the work acquires its full degree of brilliancy and depth. See FLUX.

The quality of the flux is an object of the greatest consideration to the enamel painter; when it is easily fusible, it is called soft; and when it requires a greater degree of heat, it is called hard: these terms are applied as well to the enamel grounds, and the other vitreous substances employed, as to the fluxes. It is essential that the fluxes compounded with the different colours should be of the same degree of hardness, or nearly so; as otherwise some, from being too soft, would be destroyed by the fire; while others, from having the contrary defect, would not be fixed to the plate, nor acquire their proper colour. It is necessary too, that the plate or enamel ground on which the picture is painted should be harder than the colours; for if they both melted with the same degree of heat, they would necessarily run together, and render the work indistinct.

The ground-work of the enamel plate is metal. Gold and copper are those chiefly employed. For small plates, where great neatness and delicacy are necessary, gold is

preferable, on account of its not blistering round the edges in the fire, as is the case with copper: for large plates, copper is preferred, not only on account of the difference of expence between it and gold, but because it is found from experience to be better: gold being a much softer metal than copper, the plate, if of any size, is not found to retain its original form, in passing through the fire, so well, when made of it, as when it has copper for its basis. The form of the enamel plate is slightly convex; if it were made quite flat, in passing through the fire repeatedly it would become concave. It is on this account that gold is not proper for large plates, being heavier as well as softer than copper: its own weight added to that of the enamel would naturally tend, while in a state of fusion, to sink them in the middle, and render the surface warped and uneven, unless they experienced resistance from the back, which would most probably occasion the destruction of the whole.

When platina was first discovered, it was imagined, from its great difficulty of fusion, that it would be of essential service in the making of enamel plates, but it was found to be useless for that purpose: as, although a plate made of it passed through the fire with its form unaltered in the slightest degree, there was found wanting that union between the enamel and the metal on which it is laid, that is so necessary to ensure its safety, since a slight shock was sufficient to separate them and leave the platina quite free from the enamel. With gold and copper it is quite different, it is hardly possible to free the gold entirely from the enamel, and so strict is its adhesion to the copper, that if broken it invariably brings a lamina of the copper with it. The mode of preparing the enamel plate for painting is exactly similar to that for watch and clock dialling (see ENAMELLING), with this exception, that over the enamel is passed a softer body, a flux for the purpose of incorporating with the colours laid on: this flux should agree with every colour used.

The colours used in enamel painting are all prepared from metals, earths, or other mineral bodies, mixed and melted with certain proportions of flux, which, when fused, discover the colours, and fix them to the plate. The colours of the enamel painter are few, and his palette, when compared to that of other artists, of the most discouraging description, many of them appearing very different before and after passing the fire. This is indeed one of his greatest difficulties, and one which requires the greatest practice to overcome.

PAINTING IN ENAMEL.

overcome. It is true he may lessen it by having by his side a plate on which he has made trial of his colours, and by which he has ascertained their positive colour, and what their various combinations can produce; but it is also necessary that he should have in his mind's eye the effect which the fire will give, and calculate the depth and brilliancy of his work; without this, he will be ever in danger of using one tint for another, and continually subject himself to disappointment.

It is of the greatest importance that the colours should all agree. This will entirely depend on the properties of the fluxes made use of. It would be very desirable that all the colours should be fluxed with the same materials; but as this cannot be, care should be taken that they are not of discordant principles. This disagreement manifests itself by some of the colours destroying the others when mixed, or by occasioning a bubbling of the tint in the fire, and a roughness on the surface when cold.

Some writers on the subject have considered it necessary, that to paint in enamel two sets of colours should be made use of; one hard, for the beginning of the picture; the other soft, for the latter paintings. This idea could only have originated with a person totally unacquainted with the principles of the art, as if it were not more necessary to have the full power of the colours at the finishing than at the beginning of the work: the softness or hardness of the colour depending on the greater or less degree of flux mixed with it, it is evident that in proportion to the quantity of glassy matter mixed, so will the strength of the colour be diminished. It is much better to continue the old mode of using the same colours from first to last, more freely and in greater body in the beginning, and more thinly towards the finish.

It has been said, that the French painters in enamel have discovered the mode of making the colours appear the same before as after passing the fire. If this were really the case, the advantage is not so great as at first sight it seems to be. The disadvantage is not so much the different appearance of the colour, as the want of its proper depth. This is not to be overcome but by the admission of a greater evil. To bear a colour out, an oil must be used, which will not evaporate, and the consequence of this would be, that on its application to the fire corrosion would take place, and the picture must undergo an operation which would much reduce its power before it would be fit for again proceeding with. It is towards the finish of the picture that the enamel painter's greatest difficulties begin; for such is the nature of his colours, that the parts he touches, when it is not necessary to cover the whole, whether he heightens the lights or deepens the shades, appear the same, and much lighter than the general tint. This is an operation which renders great practice and great caution equally necessary.

The principal colours whose tints are most altered by the fire are the reds, and as they are essential in the painting of the flesh, their alteration necessarily affects the whole; as the fame colour which after fire becomes a bright carmine, is before that operation of a dirty-brownish hue: this inconvenience may be lessened by exposing the colour to a slight heat, by which it will acquire somewhat of its right tint. Some painters for this purpose have mixed a portion of carmine, or some other colour which is destroyed by fire, with their rose-colours or reds, to render them when painted with the same in appearance as after they are fired: this, to say the least of it, is a very fallacious mode of proceeding, and one which an artist's practice would soon teach him to despise.

The colours used in enamel are few and simple, and from them the different tints should be made by the artist himself, (and not by the colour-maker, as used to be the case,) in the same manner as in any other way of painting. They are, white, yellows, rose-colours or reds, browns, blues, and blacks. The white is prepared from tin; the yellows from silver, antimony, and from some ochres; the rose-colours from gold; the blues from cobalt; and the browns and blacks from iron. A red may be prepared from iron, and a green from copper, but these will not agree with the other colours. A green cobalt has been lately found in some parts of Germany, from which a green may be made, as also one from the chrome; but neither is found to be in any respect better than that which may be made from blue and yellow, and it is therefore unnecessary to encumber the palette with them. No colour should be admitted till, from repeated experiment, it has been found to agree with every other in every possible combination.

The oils employed are essential, and they are such as on application to the fire evaporate with a slight degree of heat; for this purpose, the oil of spike lavender is the best. The oil of amber is used to keep the colours moist for the day's use, as it does not evaporate before exposure to heat. A thick oil of turpentine is likewise used for the purpose of binding the colours together, and making them work more pleasantly; this however must be done with the greatest caution, as if used too freely it will not escape in the fire, and will occasion corrosion.

The last process which the enamel picture undergoes is that of passing the fire: this is done after every painting, and is very often necessary; as without it the artist cannot tell the real state of his work. The fire for this purpose is of the same utility to the enamel painter, as a proof of his plate is to the engraver: it shews him what he has accomplished, and points out to him what remains to be done. The last time of passing through the fire is, as may naturally be supposed, a moment of great anxiety to the artist, as he may, in an instant, witness the destruction of his picture, and see the labour of months rendered unavailing, by the enamel ground opening and shewing a crack across his work. This accident may sometimes be repaired, but never without great labour. The mode of firing the picture is exactly similar to that used in the making of the clock plates. See ENAMELLING.

The history of enamel painting is involved in the greatest obscurity; of its antiquity we have ample testimony in the account which Diodorus Siculus gives of the painted walls executed by the command of Semiramis, in her city of Babylon. At this time, enamel painting had attained the highest eminence to which any art can aspire; when it was made the engine of policy, and the instrument of religion; when it was employed to commemorate the heroic deeds of the living, and celebrate the virtues of the dead. How long it retained this elevation we know not, but it is probable it was esteemed while Babylon remained, and, like that majestic city, was overwhelmed with such entire ruin, as scarcely to leave a wreck behind.

The coloured beads which envelope the mummies, and the painted idols of the Egyptians, prove that this art was not unknown to that extraordinary people; although nothing which exactly deserves the name of painting has descended to us.

To the Greeks it was known, as is evident from their painted vases, which although generally executed in one or two colours, yet furnish some instances in which, departing from this simplicity, they have displayed a variety of colours with great success.

PAINING IN ENAMEL.

By the Romans, if this art were not unknown to them, which, considering their intimate knowledge of the acquirements of the Greeks, is not probable, it was at least unpractised: sculpture with them seems to have superfed painting in the decoration of their vases, the embellishing of their sarcophagi, and for all ornamental purposes.

Some ornaments which have reached our time indicate that the Saxons were not unacquainted with the art of enamel; and in the tomb of Edward the Confessor are many specimens of coloured glass. Other monuments of a subsequent period prove, that the art regularly descended, although with varied success, at different intervals; but in the tomb of Edward III. John of Eltham, and some others of that period in Westminster abbey, are striking instances of the art of enamelling. On the monument of the king, the coats of arms are enamelled in their proper colours on thick plates of copper; and the armour of the warrior is curiously ornamented with an enamelled pattern of blue, white, and gold.

These remarks may be said more properly to relate to the practice of enamelling than to the art of enamel painting, and are only mentioned here to prove that it was never entirely lost sight of; although it was long after that it became enamel painting, as that term is now understood.

In the sixteenth century, ornamental works of considerable dimensions were executed: every one conversant with the arts must be acquainted with the painted dishes called *Raffaelle ware*, copied from the designs of that immortal painter and his disciple *Julio Romano*: these are, strictly speaking, legitimate enamel pictures, executed on a ground prepared as it is at present, and differing only in the shape. They are generally painted in two colours.

Enamel painting seems long to have remained in this state, and there are but few examples where a variety of colours was used until the time of *Petitot*, who died in the latter end of the seventeenth century. He is the first painter in enamel of whom any particular mention is made: he was in this country in the reign of *Charles I.* His pictures are of a small size, not exceeding two or three inches; they are very highly and beautifully finished, but certainly not deserving the distinguishing commendation bestowed on them by *Pilkington*; who says, that if they were magnified to the size of life, the pictures of *Vandyck* would suffer by the comparison. His best pictures were copied from that master, and are of a small size: his portrait of lady *Southampton*, a whole length after *Vandyck*, in the duke of *Devonshire's* collection, the largest picture he ever painted, is certainly not among his best. His works have too much that parti-coloured appearance, for which enamel painting has by persons of true taste been so justly censured. The reputation of *Petitot* was no doubt owing to the novelty of his pursuit, as he has since been much surpassed. His son practised the same act when his father quitted this country, and his pictures are now generally taken for those of his father.

No farther mention is made of enamel painting until the reign of queen *Anne*, when *Boit*, who possessed very little ability, appeared: he did not practise long in this country. He had the honour, however, of instructing *Zincke*, who far surpassed not only his master but *Petitot*. Although his pictures are not so highly finished, his best works have less of that parti-coloured effect, and consequently more the appearance of nature, than those of his great predecessor. *Petitot's* best works were copied from *Vandyck*, those of *Zincke* from *Kneller*. *Meyer*, who chiefly painted in water-colours, commenced enamel painting on the decline of *Zincke*; as he applied but little to this branch of art, he

could not be expected greatly to excel: his principal work, the portrait of the *marquis of Granby*, in the king's collection, though possessed of considerable ability and sweetness in the execution, has too many of the defects of early enamels, and by no means conveys an idea of the style of the great original from whom it is copied, *for Joshua Reynolds*. The best pictures of *Meyer* are inferior to those of *Zincke*. *Spencer's* pictures, as far as they go, are very beautiful both in colour and execution; but he, as well as all other enamel painters, confined his efforts to a very small scale, and either did not wish or thought it impossible to obtain depth and richness; his pictures, therefore, are little more than beginnings. The other professors of this art, of this period, were *Hone*, who afterwards became a portrait-painter in oil, *Spicer*, *Burch*, and *Craft*. *Craft* is only mentioned here to caution future enamel painters against an error into which he fell,—of painting on an enamel ground without the addition of a flux. The flux being softer than the enamel incorporates more readily with the colours, and gives that melting softness to the tints so peculiar to enamel painting. By omitting this, he deprived himself of one of his greatest advantages; and the consequence is, that instead of great delicacy and finishing, his pictures appear hard, crude, and inharmonious.

Stubbs, an animal painter in oil, a comparative anatomist, and eminent as either, was also a painter in enamel. Unfortunately he took up this branch of art on too confined a principle, considering rather its durability than that excellence which alone can render durability truly estimable. His pictures are painted on plates made of *Wedgwood's* ware, and he prided himself on being the maker of his colours, which are, however, of the most ordinary kind. Now, although it is desirable that the artist should know how to make his own colours, it is equally certain, that if he can get them made for him, it is much better to do so than to employ his own time in preparing the means, when it should be directed to the accomplishment of the end. Neither the material on which he worked, nor the colours with which he painted, were calculated to bear more than two or three fires, consequently great perfection could not be expected; and although they might tolerably well answer his purpose for the painting of animals, it is certain that his pictures in oil are in every respect superior to those he executed in enamel.

We have now brought enamel painting down to our own time, when such great improvements have been made by the exertions of a living artist, *Bone*, as to render it an era in the art; that he is living, must be our apology for not entering into a full discussion of his merits: but it must be said, that by his endeavours, aided by the liberal encouragement of that true lover and magnificent patron of the arts of his country, the *Prince Regent*, from a mere mechanical labour, enamel painting has become a highly useful branch of a liberal art; no longer confined to things merely ornamental, no longer differing from every other mode of painting, as much in its effect as process, it now assumes the appearance of highly-finished oil-painting, with the advantage of perpetual durability. As enamel painting from its nature must be always copied, the style of the original should be so scrupulously observed, as to convey an instantaneous recollection of the painter. In this respect, the works of *Bone* are pre-eminent; whether the severity of *Leonardo*, the purity of *Raffaelle*, the glow of *Titian*, or the splendour of *Rubens*, is entrusted to his pencil, each is alike successfully pourtrayed. To the admirers of that ornament of our country and of the arts, *Reynolds*, this must appear in its full force; and it must afford them great pleasure

pleasure to find, that such close imperishable copies of the rare and justly valued pictures of this great master can thus be transmitted to posterity.

Of the advantages of enamel painting, it would be superfluous to speak, they are so obvious as to occur to the most superficial observer. Its unalterable durability is alone sufficient to counterbalance every disadvantage to which it is subject: to paint for eternity is the peculiar province of the enamel painter. To him the hyperbolic compliment which Pope paid to Jarvis is justly due:

“Beauty, frail flow’r, which every season fears,
Blooms in his colours for a thousand years.”

How often have we mingled pity with our admiration of the fine works of the great masters, colourists in particular, when we have observed the dreadful ravages of time on their pictures. By enamel painting this disadvantage is removed; by means of this art, posterity will become acquainted with the real merits of their predecessors; and those works which must of necessity decay, will be preserved in all their original splendour. How invaluable at present would the portraits of the illustrious characters of Greece and Rome appear! Had enamel painting then been known as it is practised at present, we should not now have to seek their imperfect resemblances in busts and gems.

Thus has this art, sometimes shining forth in full splendour, sometimes nearly merged in obscurity, survived the lapse of ages, and descended to the nineteenth century, whose enlightened policy and liberal patronage will never allow it to be again disregarded; but will employ the talents of the enamel painter in the way which they can be best employed, by preserving for futurity the portraits of our illustrious ancestors, whose deeds have conferred an honour on their country; and in handing down to posterity the resemblances of our great cotemporaries, and in perpetuating the best efforts of native genius. See ENAMELLING.

PAINTING of Clocks and Watches. See the preceding article, and ENAMELLING.

PALISLEY, col. 4, l. 21, for *salvie r. salvation*.

PALAUER, an African term denoting a court of justice, or a public meeting of any kind.

PALERMO, in *Geography*, a town of America, in Maine, and county of Lincoln, having 761 inhabitants.

PALLADIUM, in *Chemistry*. According to the recent determinations of Dr. Thomson, the weight of the atom of this metal is 70, oxygen being 10; though this, perhaps, is not to be depended on, but as an approximation.

PALLADIUM. See MINERALOGY, *Addenda*.

PALMA, GIACOPO, in *Biography*, called the *Younger*, to distinguish him from his great uncle, has been styled by Lanzi, “the last painter of the good and the first of the bad epochs of the art of Venice.” He was born in 1544, the son of Antonio Palma, an obscure painter, who first taught him the little he knew, and encouraged him to study the works of others, particularly those of Tintoretto and Titian. At the age of fifteen, he obtained the patronage of the duke of Urbino, who sent him to Rome, and maintained him there for eight years, during which time he employed himself in copying the works of M. Angelo, of Raphael, and above all, of Polidoro, and was employed by the pope to adorn one of the rooms of the Vatican.

On his return to Venice he found but little employment, Tintoretto and Paolo Veronese occupying the places of renown, and being engaged in all the public works. Their disagreement with a celebrated architect and sculptor, named Vittoria, furnished Palma with a patron, who endeav-

avouring to lower the esteem of his enemies, used his utmost efforts to establish the rival painter, assisted him with his advice, and found him employment. Their united endeavours failed however of success, and Palma was obliged to be contented to hold the third rank in the art till their deaths left him without a rival. He had, in the mean time, painted in competition with them both, and produced very excellent works.

When he was left alone and was much employed, he relaxed from the care and diligence he had formerly used, and his works became slight in execution, so much so that Cesare d’Arpino, remarking upon the slightness of the style in which he painted, observed, that he meant to make some stay at Venice, to learn of him to make such admirable sketches. When price and time, however, were left to his own discretion, in which he did not abound, he produced some works worthy of his former fame; such as the altarpiece at the church of S. Cosmo and Damiano; the celebrated naval battle of Francesco Bembo, in the public palace; the Saint Apollonia at Cremona, &c. The compositions of the younger Palma are more distinguishable for their copiousness than the judgment with which they are conducted, and his design is more bold than correct. His colouring is more vivid than true, but is deservedly admired for its richness, suavity, and freshness.

PALMER, in *Geography*, l. 4, r. 1114.

PALMYRA, a township of Maine, in the county of Somerset, having 117 inhabitants.—Also, a township of Wayne county, in Pennsylvania, having 336 inhabitants.—Also, a township of Knox county, in the Indiana territory.

PALOMINO Y VELASCO, DON ANTONIO, in *Biography*, a Spanish painter, born in Valencia, in 1653. He studied at Cordova in grammar, philosophy, theology, and jurisprudence: the elements of his art he acquired of Don Juan de Valdes Seal, and to acquaint himself with the styles of the different schools, he went to Madrid in 1678. Here he painted the gallery del Cierzo, and pleased the king and the minister, and in 1688 he was made painter to the king. He was overwhelmed with commissions, for many of which he made only the designs; but whatever was begun and terminated by himself in fresco, or in oil, possesses invention, design, and colour, in the essential, and taste and science in the ornamental parts. His style was certainly more adapted to the demands of the epoch in which he lived, than to those of the preceding one, and probably would not have obtained from Murillio the praises lavished on it by Lucca Jordano.

Palomino may be considered as the Vasari of Spain, as copious, as credulous, and as negligent of dates, too garrulous for energy, and too indefinite for the delineation of character, but eminently useful with the emendations of modern and more accurate biographers.

His literary work is divided into three parts, theoretical, practical, and biographical. The two first bear one title, *viz.* “El musco Pictorico y escuela optica.” The third part, distinguished by that of “El Parnasso Espanol Pintoresco laureada, &c.” Madrid, 1724, though perhaps only intended as an appendix to the two former, is by far the most important and interesting.

PALOU, or PALO, l. ult. add—pachalic of Erzerroom, situated on the edge of a mountain and the banks of the Euphrates: the population amounts to about 8000 souls, Turks, Armenians, and Kurds: the river here is very rapid, and from the bad construction of the bridges made of wood, whole caravans have been swept away after the melting of the snow. The district of Palo is four days’ journey in length and two in breadth.

PANDEANS,

PANDEANS, a title given to itinerant companies of Italian musicians, who perform on the Syrinx or Pan's pipes of different pitches with their mouths, and accompany themselves on different instruments with their hands and feet.

The lowest set of reeds (the *septem discrimina vocum* of Virgil) is called the contra basso, or double-bass; the next fagotto, or bassoon; the third, septenary, is the tenor or second treble; and the fourth, or highest range of pipes, the first treble: so that in the aggregate there is a complete scale of four octaves, and they never play in less than three or four parts. The instruments with which they accompany themselves with their hands are the cymbals, the triangles, the double drum beat at both ends, the mezza luna, a Turkish instrument, and the tambour de basque.

The reeds or pipes are fastened under the chin of the performer, and the lip of the player runs from one to the other with seeming facility, without moving the instrument by manual assistance. (*Et supra calamos uno percurrere labro, Lucretius.*) The music which these people perform is very gay and pleasing. One of the company with whom we conversed told us that they were Milanese peasants and villagers, not allowed to stroll into great cities: which accounts for our never having heard them in their own country, nor any of our friends who have made the tour of Italy, and remained there some years.

The use which these ingenious people have made of Pan's pipes, by playing in troops and in different parts, is beating the ancients at their own weapons. The Grecian shepherds of Theocritus, and the Roman of Virgil, contend in dialogue, but never perform in parts.

It will be observed, that some of the performers, particularly the first treble, have more than seven pipes, which enables them to extend the melody beyond the septenary.

PANIS. Add—See TOWIACIES.

PANTING, in *Physiology*. See LUNGS.

PANTON. Add—containing 520 inhabitants.

PAPER CURRENCY, 1.8 from the end, *dele* where; 1.5, insert—not.

PAR of *Exchange*, col. 2, l. 24, for *lofs r. els*.

PARADISE, l. 2, r. 1548.

PARASANG. Add—The parasang at a mean was little short of $3\frac{1}{2}$ British miles. The parasanga of Xenophon was no more than 3 Roman miles, or 2.78 British miles. Herodotus and Xenophon say, that the parasanga consisted of 30 stadia; and as these may be supposed to have been of the Grecian itinerary standard, the parasanga would be equal to 2.9 British miles, or $\frac{1}{2}$ th only longer than that of the Anabasis. Rennell's Illustration of the Expedition of Cyrus.

PARHELIUM, col. 2, *figs.* 23, 24; l. 14, r. 1320.

PARIS, in America, l. 13, r. Oxford for Cumberland.

PARIYATEKA, l. 12, for This r. There.

PARK, MUNGO, in *Biography*, a celebrated traveller, was the son of a farmer on the banks of the Yarrow, near the town of Selkirk, in Scotland, and born on the 10th of September 1771. After having received the first rudiments of education in his father's family, he was removed to a grammar-school at Selkirk, where he remained for a considerable number of years, and where he was distinguished by his application and improvement. At this early period, though he was sedate, studious, and thoughtful, he manifested traces of that ardent and adventurous disposition which formed his distinguishing character in future life. Preferring the medical to the ecclesiastical profession, for which he was originally designed, he was bound apprentice, at the age of 15, to Mr. Anderfon, a respectable surgeon at Selkirk; and after residing with him for three years, he removed

in 1789 to Edinburgh, where he attended the usual medical lectures during three successive sessions. In this situation he distinguished himself among his fellow-students, by arduous and assiduity in the prosecution of his studies, and by particular attention, during his summer vacations, to botanical pursuits, in which he was assisted by his brother-in-law Mr. James Dickson. Upon his removal to London, this eminent botanist introduced him to Sir Joseph Banks, by whose recommendation he was appointed assistant-surgeon to the Worcester East Indian. In 1792 he failed for Bencoolen, and having availed himself of the opportunities for scientific researches, which this voyage afforded him, the result of his inquiries and observations was communicated, after his return, to the Linnæan society, and published in the third volume of their Transactions. Some years prior to this period, a society had been formed with a view of promoting discoveries in the interior parts of Africa, of which we have already given a brief account under the article AFRICAN Association; and several persons had been employed in accomplishing the laudable purposes for which this society was established. Among these, we may reckon Messrs. Ledyard and Lucas, major Houghton, and Mr. Hornemann, who fell sacrifices either to the severity of the climate, the fatigue of the service, or the violence of the natives. The Society, though disposed to afford liberal encouragement to any person who was qualified for this undertaking, and who had at the same time resolution sufficient to engage in it, with the prospects which past experience presented to view, found themselves at a loss for a person in every respect fit for this hazardous mission. At this interesting period Mr. Park returned from India, and no person could have been found better qualified for such an adventurous office. Sir Joseph Banks, the distinguished patron of genius and science, had been his friend, and with him Mr. Park was in habits of frequent and intimate intercourse. Thus circumstanced he offered his services, and they were accepted. Having received his final instructions from the Society, he set sail from Portsmouth on the 22d of May 1795, and on the 21st of June landed at Jillifree, a small town near the mouth of the river Gambia, whence he proceeded to Pisania, where he was hospitably received by Dr. Laidley, to whom he had letters of recommendation. For an account of his progress, see the articles AFRICA and AFRICAN Association. Upon his return, he was received with cordial congratulation, both by his friends and the gentlemen of the African Association; and he was allowed to publish an account of his travels for his own benefit. In the mean while, Mr. Bryan Edwards, secretary of the Association, printed and distributed among the subscribers an abstract of the Travels from Mr. Park's papers. To this abstract was annexed an important Memoir by major Rennell, consisting of geographical illustrations of Park's journey; and this, by Mr. R.'s permission, formed a valuable appendage to the fourth edition of the Travels. In the spring of 1798, government having it in contemplation to obtain a complete survey of New Holland, applied to Mr. Park for this purpose; but the proposed plan was never executed. The remainder of this year was spent by Mr. Park in visiting his friends in Scotland, and arranging the materials of his Travels. Towards the close of this year he returned to London, and devoted the principal part of his time to the correction of his MSS., which he committed to the press in the spring of the year 1799. The work, as soon as it was published, commanded an extensive and rapid sale, both on account of the interesting information which it contained, and the general elegance of its composition. An abstract of Mr. Park's discoveries,

with

with regard to the easterly course and magnitude of the Niger, the large and populous towns and villages that occupy the interior parts of Africa, the discriminating character of the negroes, contrasted against that of the Moors, and the civilization of the inhabitants of the interior, beyond the influence of the slave-trade, compared with that of those who are situated near the coast, and a variety of other particulars relating to the soil and productions of the country, and the manners and habits of its inhabitants, has been already given under the articles AFRICA, MONROCO, NIGER, &c. so that we need not here enlarge. The curiosity of the public was amply gratified, and the name and work of Mr. Park became singularly popular, though neither the one nor the other altogether escaped censure. The slave-trade was at this time a subject of general reprobation, and attempts were repeatedly renewed for the abolition of it. It was, therefore, natural to imagine, that in a work of this kind, the author would have availed himself of the opportunities which his narrative afforded him, of expressing his decided disapprobation of this nefarious species of commerce: more especially as it was well known to many of Mr. Park's intimate and confidential friends, that in conversation he had frequently declared his abhorrence of slavery and the slave-trade. Nor was it sufficient to allege, as some of his advocates have done, that he considered the abolition of the slave-trade as a measure of state policy; and that it would be improper for him to give an opinion on a subject which was at this time under the deliberation of the legislature. This neutrality on his part, to say the least of it, led persons, who did not know his real sentiments, to reckon him among those who were hostile to the abolition; and his authority was triumphantly appealed to by the advocates of the slave-trade. Whilst he seems to have studiously avoided giving an opinion on the pernicious influence of this trade, he states facts which have been cited and strongly urged in favour of its abolition. In order to account for this kind of inconsistency without impeaching his integrity, we should recollect how he was circumstanced whilst he was preparing and publishing his narrative. "He was then," says a candid biographer, "a young man, inexperienced in literary composition, and in a great measure dependent, as to the prospects of his future life, upon the success of his intended publication. His friend and adviser, Mr. Bryan Edwards," (a West India planter, and a systematic advocate of the slave-trade in the House of Commons), "was a man of letters and of the world, who held a distinguished place in society, and was besides a leading member of the African Association, to which Park owed every thing, and with which his fate and fortunes were still intimately connected. It is difficult to estimate the degree of authority which a person possessing these advantages, and of a strong and decisive character, must necessarily have had over the mind of a young man, in the situation which has now been described. Suggestions coming from such a quarter must have been almost equivalent to commands; and instead of severely animadverting on the extent of Park's compliances, we ought, perhaps, rather to be surprised, that more was not yielded to an influence which must have been nearly unlimited." Mr. Park is known to have regretted that some parts of his publication, relating to the slave-trade, had been misunderstood, and applied in a sense which it was not intended they should have been. The writer of this sketch of his life knew, from personal intercourse, that he lamented any suspicion of his integrity should attach to this part of his publication; and we can well imagine, that he did not perceive the bias of his mind, or the causes that produced it, which were apparent to every one besides himself. Such a bias

would naturally result from the assistance afforded by Mr. Edwards in the composition of Mr. Park's work, and from the influence attending the connection that subsisted between them. How far Mr. Edwards's assistance might extend, it is difficult to say; but of this we are certain, that it was not such as to affect the authenticity of the work itself, or the literary reputation of Mr. Park; we regret, however, that in deference to Mr. Edwards's judgment or authority, Mr. Park should admit into his narrative some reflections pertaining to the slave-trade, which should have given occasion for concluding that he was friendly to its continuance, or that he should have omitted any favourable opportunity that occurred for expressing in an explicit manner his real sentiments concerning it. But it is now needless to pursue this kind of discussion. The narration of Mr. Park, written as we have reason to believe by himself, entitles him to respect as an author; but he has other more unequivocal claims to grateful and honourable remembrance, as a person who hazarded much in making geographical discoveries, and who maintained in traversing unknown countries, and in very trying situations, a degree of firmness and self-possession that has seldom or ever been surpassed.

After the publication of his Travels, he returned to Scotland in the summer of 1799; and on the 2d of August in that year, he married a daughter of Mr. Anderfon of Selkirk, with whom he had served his apprenticeship. In the month of October 1801, he settled at Peebles, with a full purpose of pursuing his medical profession; but as he devoted much of his time and attention to the poor, the profits of his business were inconsiderable; nor could he forbear wishing for a change of situation that would be more advantageous. His views, however, were directed towards a second African mission. A prospect of this kind was presented to him by a letter from Sir Joseph Banks, soon after the signature of the preliminaries of peace with France, in October 1801; but it was not till the autumn of the year 1803, that a specific proposal was made to him for this purpose. Previously disposed to accept it, he did not long hesitate in announcing his purpose; and, accordingly he took leave of his friends, and left Scotland in December 1803, confidently expecting that he should soon embark for the coast of Africa. A variety of circumstances occurred which threatened the total failure of the expedition; however, in a course of time all difficulties were obviated; the objects and plan of the undertaking were settled to the satisfaction of Mr. Park, and he received a commission from government in January 1805, for conducting and executing it. To himself was granted a brevet commission of a captain in Africa; and to his friend Mr. Alexander Anderfon a similar commission of lieutenant; and Mr. Scott was appointed to attend him as a draftsman. He was empowered to enlist at Goree any number of the garrison that would be necessary for his purpose, not exceeding 45, with such bounties as would induce them cheerfully to accompany him. From Goree he was directed to proceed up the river Gambia, and thence, crossing over to the Senegal, to march by such routs as he should find most eligible to the banks of the Niger. The great object of his journey was to pursue the course of this river as far as it could be traced; to establish a communication and intercourse with the different nations on the banks; to obtain all the knowledge in his power respecting them; and to ascertain various points which he had stated in his Memoir. Mr. Park was empowered to draw for any sum which he might want, not exceeding 500*l.*

When the preparations for the expedition were completed, Messrs. Park, Anderfon, and Scott, proceeded to Portsmouth,

PARK.

mouth, and being there joined by four or five artificers from the dock-yards appointed for the service, they set sail on the 30th of January 1805, and on the 28th of March arrived at Goree. On the 27th of April 1805, Mr. Park took his departure from Kayee, a small town on the Gambia, a little below Pifania, having previously engaged a Mandingo priest, named Ifaacu, who was also a travelling merchant, and much accustomed to long inland journeys to serve as a guide to his caravan. On the 11th of May, he arrived at Madina, the capital of the kingdom of Woolli, and on the 14th he reached Kuffai, on the banks of the Gambia, where the river is about 100 yards broad, and has a regular tide. On the 18th, he crossed the river Nerico, 60 feet broad four feet deep, flowing at the rate of two miles an hour, and with a heat at two o'clock of 94° Fahrenheit, and arrived at Jallacotta, the first town of Tenda, at sun-set. On the 20th reached Tendico or Tambico, a village belonging to Jallacotta, lat. $13^{\circ} 53'$, half a mile from which is a pretty large town, called Bady. May 21st at eight, halted at Jeningalla, near Bufra or Kabatenda. On the 24th, stopped at Manfara, which consists of three towns, contiguous to each other, and distant from the village of Nittakorra, on the north bank of the Gambia, eight miles due south. Next day entered the Tenda or Samakara wilderness, and halted at Sooteetaba, lat. $13^{\circ} 33' 33''$; after leaving this place, crossed the first range of hills, which afforded a beautiful route and prospect. On the 26th reached Beecreek, lat. $13^{\circ} 32' 45''$, W. long. $10^{\circ} 59'$, where men and bealls were attacked by an immense number of bees, who seemed for a time to have completely terminated their journey. Arrived at Sibikillin, after travelling four miles, on the 27th; and on the 28th, arrived at Badoo, a small town, consisting of about 300 huts, near which is another town of the same name; but the two towns are distinguished by the names of Sanfandig and Sanfanba, at each of which customs are demanded of all coffees or caravans, lat. $13^{\circ} 32'$. From Badoo proceeded to Tambacunda, about four miles east of it, and about four miles distant from the river Gambia, south of Badoo: leaving Tambacunda on the 30th, entered the woods, and at dark arrived at Tabba Gee, which was left at day-break the 31st of May, and halted during the heat of the day at a small village, called Mambari. On the 1st of June, arrived at Julifunda, a considerable trading town, containing about 2000 persons, who trade on credit, and are called "Juli," by way of distinction from the Slatee, who trades with his own capital. At this place, lat. $13^{\circ} 33'$, they were exorbitantly taxed by Manfa Kuffan, who is reckoned one of the most avaricious chiefs on the road. On the 4th of June, arrived at Baniferile, a Mahometan town, whose chief, Fodi Braheima, was one of the most friendly men they met with, lat. $13^{\circ} 35'$. The kingdom of Dentila is famous for its iron; and the flux used for smelting it is the ashes of the bark of the kino-tree. On the 7th of June, in prosecution of their journey, crossed the bed of a stream that runs towards the Faleme river, called Samakoo, on account of the vast herds of elephants which wash themselves in it during the rains. At noon of the 8th, reached Madina, and halted by the side of Faleme river; in the evening went to Satadoo, one mile east of the river. On the 10th reached a small town called Shrondo at sun-set; here they were alarmed by a tornado, which was the commencement of the rainy season, and extremely pernicious to the attendants on the expedition.

In the vicinity of this town are some gold-mines, which were inspected, and which afforded occasion for witnessing the expeditious mode practised by the female na-

tives, for separating the particles of gold from the sand. Leaving Shrondo on the 12th, they travelled along the bottom of the Konkodoo mountains, which are very steep precipices of rock, from 80 to 200 or 300 feet high, and at noon reached Dindikoo, near which are gold-pits. On the 13th, they arrived at a small village called Fankia, four miles N.W. from Bidingalla, lat. $13^{\circ} 22' 30''$. On the 15th, they proceeded from Fankia to the delightful village of Toombin, and on the 17th travelled from Serimanna to Fajemmia, a small village, fortified with a high wall, the chief of which is the most powerful in Konkodoo, and has in subjection the whole country from Toombin to the Ba Fing. At Fajemmia, N. lat. $13^{\circ} 35'$, the customs paid to the chief are very high. On the 20th, they arrived at an almost deserted village, called Nealakalla, close to the Ba Lee or Honey river, where they saw two crocodiles and an incredible number of large fish. On the 21st, they passed the village of Boontoonkoooran, and halted for the night at the village of Doog-gikotta; and the next day they observed many very picturesque and rocky hills during their march, and in the evening halted at the village of Falising, situated on the summit of the ascent which separates the Ba Lee from the Ba Fing. On the 23d, they arrived at the village of Gimbia, or Kimbia; and about noon reached Sullo, an unvalled village, at the bottom of a rocky hill, at which place horse-flesh is much valued as food, and where they observed on the adjacent rocks numbers of large monkeys. On the next day, they arrived at Secoba, lat. $13^{\circ} 27' 26''$, and here they halted on the 25th. On the following day, they arrived at the village of Konkromko, about seven miles east of Secoba, W. long. $8^{\circ} 6'$, near the river Ba Fing, a large river quite navigable, and which they crossed in canoes on the 27th; and on the next day, they passed by several heaps of stone, precisely the same with those that are called in Scotland cairns. In pursuing their march, they were alarmed by herds of lions and wolves, and on the 30th, reached a small town, called Kandy. On the 2d of July, they arrived at Koena, a village encompassed by a wall, and where they were terrified by the roaring and assault of several young lions. On the 3d, they arrived, after a march of six miles, at Koombandi; and at sun-set reached Fonilla, a small walled village, on the banks of the Wonda, which they crossed on the 4th in canoes, Ifaacu having had a surprising escape from the seizure of a crocodile. On the 5th, they arrived at a village called Boolinkoomboo, sometimes Moiaharra; and on the 10th, left this village; and eight miles N.E. passed the village of Serrababoo, and a little before sun-set reached Saboofera, (Doody Matta,) a scattered unvalled village, lat. $13^{\circ} 50'$. From Saboofera, or Mallaboo, they pursued their march on the 11th to Keminoo, or Maniakorro, a walled town, strongly fortified, lat. 14° ; near which the river Ba Lee runs with great velocity, and breaks into small cataracts. This place is notorious for theft and impudence, and they were glad to leave it on the 13th, and to pursue their march by a walled village, called Nummaboo, to the banks of the Ba Woolima, where they arrived on the 19th; and having crossed the river by means of a wooden bridge of singular construction, they reached Mareena on the 21st, where they suffered depredation; and on the 22d, they arrived at Bangalli, six miles from Mareena, a large town, four or five times larger than Maniakorro, and fortified in a similar manner. On the 27th, they arrived at Nummafoolo, a large but much ruined town, and which they left on the 30th. On the

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31st, they halted at Sobce, a town, the walled part of which serves as a citadel. On the 2d of August, they halted at Balanding; and on the 3d, at Balandoo; and on the 4th reached Koolihori, a town partly walled, but having the greater part of its huts without the walls. On the 6th, they reached Ganifarra, a small beggarly village. On the 9th, they crossed the Ba Woolli, a very deep river, flowing at the rate of four or five miles *per* hour. They pursued their route, until on the 13th, those of them who survived reached Koomikoomi, where they halted; lat. $13^{\circ} 16' 29''$. On the 15th, they reached Doombila, where Mr. Park met with an old friend, Karfa Taura, a worthy negro whom he had known, and whose kindness he had experienced in his former travels. From Doombila, they proceeded on the 18th to Toniba, and from thence they ascended the mountains south of it, till having attained the summit of the ridge which separates the Niger from the remote branches of the Senegal, Mr. Park had the satisfaction of once more seeing the Niger rolling its immense stream along the plains. But this satisfaction was accompanied by the mortifying reflection, that three-fourths of the soldiers had died on their march, and that in their weakly state, they had no carpenters to build the boats in which they proposed to prosecute their discoveries. It was, however, a pleasing consideration, that in conducting a party of Europeans, with immense baggage, through an extent of more than 500 miles, he had always been able to preserve the most friendly terms with the natives; and hence he was warranted to infer, that with common prudence, any quantity of merchandize may be transported from the Gambia to the Niger, without danger of being robbed by the natives; and that this journey may be performed in the dry season, with a probability of not losing more than three or at most four out of fifty. But Mr. Park was unfortunate in undertaking such a journey with the prospect of the rainy season, and the event proved, that this season set in before his journey to the Niger was more than half completed. The effect produced on the health of the soldiers by a violent rain, preceded and accompanied by tornadoes, on the 18th of June, was almost instantaneous; twelve of them at once were dangerously ill, and from this time, the great mortality commenced, which was ultimately fatal to the expedition. When he reached the Niger at Bambakoo, where the river begins to be navigable, on the 19th of August, there remained out of thirty-four soldiers and four carpenters, who left the Gambia, only six soldiers and one carpenter, and the principal persons who composed the expedition, besides Mr. Park himself, were three, *viz.* Mr. Anderfon, Mr. Scott, and lieutenant Martyn, who were more or less affected by the disease of the climate; the two former very seriously, so that Mr. Scott was left behind at Koomikoomi, and died without reaching the Niger. Mr. Park had been slightly affected, and it is wonderful, that the anxiety and fatigue which he must have experienced did not break down both his spirits and his strength.

Having arrived at the Niger, Mr. Park, and the few companions that remained, embarked in a canoe on the 22d of August, and were borne away by the current at the rate of about five knots *per* hour. The river is at the point of embarkation an English mile broad, and at the rapids, of which there are three principal ones, it spreads out to nearly twice that breadth. On the 23d, they arrived at Marraboo, where they were joined by those who came by land. Ifaaco was immediately dispatched to Sego, the capital of Bambara, to negotiate with Manfong, the sovereign, for a free passage through his dominions, and

whilst Mr. Park waited for his return, he was seized with the dysentery, that threatened the termination of all his projects. But by the aid of medicine and the advantage of a good constitution, he was soon restored to health. Many difficulties and delays occurred in the negotiation, which was conducted on the part of Mr. Park with singular judgment and address; but at length, after many unfavourable rumours, which kept his mind in a state of distressing suspense, Manfong deputed a messenger to conduct him towards Sego. Under his escort, he left Koolikorro (N. lat. $12^{\circ} 52'$) on the 13th of September, and enjoyed the beautiful views which his voyage afforded him; "the river," as he says, "being sometimes as smooth as a mirror, at other times ruffled with a gentle breeze, but at all times sweeping us along at the rate of six or seven miles *per* hour." On the 14th, they departed from Deena, where they had lodged, and arrived at Yamina, (lat. $13^{\circ} 15'$;) where they halted on the 15th; and on the 16th reached Samee (lat. $13^{\circ} 17'$). A deputation of Manfong's friends visited Mr. Park, in order to hear from himself a statement of his views and purposes in the voyage he was undertaking. His statement was satisfactory to the grantees that had executed this commission, and Mr. Park was assured of permission to pursue his voyage, and of protection from Manfong as far as his power extended. The king and his courtiers were much gratified by the presents which they received on the occasion. Accordingly, on the 26th of September, Mr. Park proceeded from Samee to *Sanfanding*; which see. Here he intended to provide a proper vessel for his further navigation down the Niger; but it was with difficulty that he procured from Manfong and his son, in return for the presents he had given them, two decayed canoes, which merely afforded him materials for constructing with his own hands, and some assistance from one of the surviving soldiers, a flat-bottomed boat, to which he gave the founding title of His Majesty's Schooner, the Joliba. In the meanwhile, Mr. Park was informed of the death of Mr. Scott, and he had now occasion to lament the loss of his friend Mr. Anderfon, who died, after a lingering attack of four months, on the 26th of October. The sensibility he expressed on this occasion did honour to his feelings, and yet considering his present perilous situation, and the dreary and discouraging prospects which presented themselves with regard to the projects of his undertaking, he must possess a very high degree of equanimity, firmness, and self-possession. On the 16th of November, the schooner having been completed, and every thing in Mr. Park's power to command being ready for the voyage, he closes his journal; and in the course of the succeeding days previous to his embarkation, which was on the 19th, he wrote several letters to his friends and kindred in England and Scotland. In these letters, we discover traces of that deliberate and inflexible resolution, without effort or ostentation, which proved a distinguishing feature of his character. From this period, we have no strictly authentic information concerning Mr. Park, or the progress and termination of his expedition. In the course of the year 1806, conjectures and reports agitated the public mind; and the agitation was aggravated, by intelligence communicated by the native traders from the interior of Africa to the British settlements on the coast; whence it was concluded, that Mr. Park and his companions were killed. In consequence of these unsatisfactory and alarming rumours, lieutenant colonel Maxwell, then governor of Senegal, obtained permission from government to engage a proper party to investigate and ascertain the truth of these rumours.

rumours. Accordingly, he engaged Ifaaco, Mr. Park's guide, to conduct this business. In January 1810, Ifaaco left Senegal, and returned on the 1st of September, 1811, fully confirming the reports of Mr. Park's death. His journal, including another from Amadi Fatouma, the guide who had accompanied Park from Sanfanding down the Niger, was delivered to the governor, and transmitted by him, after having been translated from Arabic to English, to the secretary of state for the colonial department. From Amadi Fatouma's journal we learn, that the conductors of the expedition went from Sanfanding to Silla, where Mr. Park had ended his first voyage; and that from thence, Mr. Park, Martyn, three other white men, three slaves, and Amadi, as guide and interpreter, nine in number, proceeded in a canoe to Ginne; and as they passed Sibby, or Dibbie, they were attacked by an armed force in three canoes, which they repulsed. Again at Rakbara, or Kabra, they repelled another assault, and in passing Tombuctoo, they resisted another similar attack, escaping by force and by the slaughter of many of the natives. As they advanced, the number of hostile canoes increased, till at length it amounted to 60, and in self-defence they killed a very considerable number of persons; their own number being now reduced by the death of one of the white men to eight. At length having passed Kasso and Gourmon, and having supplied themselves with provisions, they entered the country of Haoussa. The king of the country having received information from the chief of Yaour, a village in this district, that the white men had departed without giving them any presents, sent an army to a village called Bouffa, near the side of the river, which was posted on the top of a rock that traversed the river, in which rock there was a large cleft or opening, that admitted the water to pass in a strong current; and when Mr. Park arrived at this opening and attempted to pass, he was attacked with lances, pikes, arrows, and stones; against which he for some time resolutely defended himself, till at length, overpowered by numbers and fatigue, and unable to keep up the canoe against the current, Mr. Park laid hold of one of the white men and jumped into the water; Mr. Martyn did the same, and they were drowned in the stream in attempting to escape. One slave was left, and they took him and the canoe, and carried them to the king. Amadi, after having been kept in prison for three months, was released; and obtained information from the surviving slave, concerning the manner in which Mr. Park and his companions had died. Nothing was left in the canoe but a sword-belt, of which the king had made a girth for his horse; and this belt Ifaaco afterwards recovered. Amadi, according to Ifaaco's report, was a good upright man, and delivered the above account to him on oath, nor could he have any interest in deceiving him. From circumstances it is concluded, that Mr. Park died four months after his departure from Sanfanding.

On Mr. Park's disposition and character it is needless to enlarge, after the detail of the principal transactions and events of his life given in this article and the article AFRICA. In private life his conduct was exemplary, as a son, a husband, and a father. As to his person, he was about six feet high, and well proportioned. His whole aspect was interesting, and his corporeal frame robust and active, and fit for great exertion, and for enduring severe hardships. His family consisted of three sons and one daughter, who with their mother survived to lament the loss of him. See the second volume of his Travels, a new edition of which was published in 1816, 8vo. For some other particulars, we refer to the articles AFRICA, NIGER, and ZAIRE.

PARKER, in *Geography*, a township of Butler county, in Pennsylvania, having 399 inhabitants.

PARKER'S TOWNS, a town of Kent county, in Vermont, having 100 inhabitants.

PARSONSFIELD, l. 4, r. 1763.

PARTHENOS. See PARTHENIA.

PARVATI, col. 2, l. 34, *dele* the point after Kailasa. Col. 3, l. 6, for cap r. cup. Col. 4, l. 35, for beauty's r. brevity's. Col. 5, l. 2, for *Karikya* r. *Karikya*; l. 3 from bottom, for central is r. central eye is.

PASQUATUNK, in *Geography*, a county of North Carolina, containing 7674 inhabitants, of whom 2295 were slaves in 1810.

PASTE-WORK, in *Calico-Printing*. See *Dijfcharge-Work*.

PATMOS, l. 14, add—Such is the account given by Sonnini; but Dr. Clarke (*Travels*, vol. vi.) informs us, that he visited the library, which is a small oblong chamber, with a vaulted stone roof, and found it to be nearly filled with books of all sizes in a most neglected state; some lying upon the floor, a prey to the damp and worms; others standing confusedly on the shelves, which were printed volumes, some of which were well bound, and in good condition; but neither of the superiors of this college was able to read. At the extremity of the chamber he found a heap of Greek MSS., some of which were of the highest antiquity; amongst other specimens of Grecian calligraphy, the author found a copy of the 24 first dialogues of Plato, written upon vellum, in the same exquisite character, which remained in the hands of his friend professor Porfont until his death. But it is now, with the other MSS. from Patmos, &c. in the Bodleian library at Oxford.

PATRICK, l. 2, r. 4699 inhabitants, of whom 724 are slaves.

PATRICK TOWN, a town of America, in the district of Maine, and county of Lincoln, having 138 inhabitants.

PATROCLEIA, or PATROCLEA, in *Geography*, one of the Grecian islands, called by various other names, as Gaitharoné (Aflés' ile), the island of Ebony, Gaidromea, Gardener's, &c. which difference of names has caused it to be multiplied and represented as a cluster of islands rather than as one island. It has been said, that ebony grows upon this island; but Dr. Clarke and his companions could not find a single specimen of the Ebenus, either *cretica* or *pinnata*.

PATTON, a township of Centre county, in Pennsylvania, having 297 persons.

PAVAKA, for sacrifices r. sacrificers.

PAUCARCOLLA, for PAUCARCOTTA.

PAULSBURGH, in *Geography*, a township of Coos, in New Hampshire, having 14 inhabitants.

PAXTON, l. 2, r. 2232; l. 3, r. 2180—2998; l. 6, r. 619. Add—Also, a township of Ohio, in Ross county, having 661 inhabitants.

PEACHAM, l. 3, r. 1301.

PEARL RIVER, l. 12.—This is the largest river between Mississippi and Mobile. Before it enters the Regulets or Rigolets, it divides into several channels.

PEARL-SPAR. See MINERALOGY, *Addenda*.

PEARL-STONE. See MINERALOGY, *Addenda*.

PEASE, in *Geography*, a township of Belmont county, in Ohio, having 1379 inhabitants.

PEA-STONE. See MINERALOGY, *Addenda*.

PEDAL HARP. The machinery of this instrument was invented by M. Simon at Brussels, about the year 1760, and was soon adopted in France. In the eighth volume of the folio Encyclopaedia, printed in 1765, it is said, that "the sounds of the pedal harp are more sweet and melodious than those

those of any other fringed instrument played with the naked fingers; that it is more touching and proper to express tenderness and grief than other affections of the heart; that the strings must be moderately struck, otherwise the music would be as confused as on the harpsichord or pianoforte without dampers; and, lastly, the author of the article (the comte de Hoghenki) says, that the Irish, of all the people in the world, are those reputed to perform the best on the harps of their country.

PEDILUVIUM, in *Medicine*, from *pedes*, the feet, and *lavo*, I wash, a bathing or immersion of the feet in warm water.

The older practitioners resorted to the pediluvium in a variety of diseases upon hypothetical principles; conceiving that, by drawing the blood into the vessels of the feet, it relieved distant organs, as the head or lungs, which were overcharged by a state of inflammation in congestion; hence it was recommended in apoplexy, pleurisy, and other topical affections of distant parts. This doctrine of revulsion, however, as applied to the operation of the pediluvium, is more questionable than under any other application of it; for as, like the general warm-bath, it somewhat accelerates the general circulation, it must be a doubtful remedy in cases where the motion of the heart and arteries is already too great.

The operation of the pediluvium is, in fact, simply that of a partial warm-bath; and its use is at present limited to those disorders in which that more general remedy is indicated; being a more practicable and easy expedient, though necessarily much less effectual in its influence. The most valuable and common application of the pediluvium is at the onset of febrile diseases, while a certain degree of chilliness is present. Used in this state previous to going to bed, it contributes, by moderately exciting the heart and arteries, to equalize the circulation, and determine the blood to the surface, whence a slight diaphoresis often follows its use under these circumstances. Thus the attack of a commencing catarrh or rheumatism is often warded off by the use of pediluvium, aided by other proper means; and to this kind of treatment its operation is probably to be limited. In the more advanced stage of febrile diseases, especially when there is delirium, or a general heat, its advantages are very problematical.

PEDRICK ISLAND, in *Geography*, a township of Plymouth county, in Massachusetts, having 7 persons.

PEELING, l. 2, r. 203.

PEEPEC, a township of Ohio, in Ross county, containing 670 persons.

PEGYSPENT, a town of Maine, in the county of Cumberland, having 805 inhabitants.

PELHAM, l. 3, r. 1185; l. 7, r. 998.

PEMBROKE, in *America*, l. 3, r. 2051. Col. 2, l. 1, 2, r. 1153.

PENCADER, a hundred of Newcastle county, in the district of Delaware, having 1865 persons.

PENDLETON, l. 4, r. 4239 inhabitants, of whom 202 are slaves; l. 6, r. 22,897; l. 23, r. 3485. Col. 2, l. 1, r. 2940; l. 2, r. 346.

PENDULUM, col. 10, l. 16, add—The latest and most correct experiments that have been made for determining the length of the pendulum vibrating seconds are those of captain Kater. These experiments were performed with a pendulum constructed on the following principle: In illustrating this principle he states, as a known fact, that the centres of suspension and oscillation are reciprocal; or, in other words, that if a body be suspended by its centre of oscillation, its former point of suspension becomes

the centre of oscillation; and the vibrations in both positions will be performed in equal times. As the distance of the centre of oscillation from the point of suspension depends on the figure of the body employed, if the arrangement of its particles be changed, the place of the centre of oscillation will also suffer a change. Suppose then a body to be furnished with a point of suspension, and another point on which it may vibrate, to be fixed as nearly as can be estimated in the centre of oscillation, and in a line with the point of suspension and centre of gravity. If the vibrations in each position should not be equal in equal times, they may be readily made so, by shifting a moveable weight, with which the body is to be furnished, in a line between the centres of suspension and oscillation; when the distance between the two points about which the vibrations were performed being measured, the length of a simple pendulum, and the time of its vibration, will at once be known, uninfluenced by any irregularity of density or figure. This principle being adopted for the construction of the pendulum, the next object of importance is to select a mode of suspension equally free from objection. For this purpose a knife-edge was preferred, and the grounds of preference are briefly stated. The pendulum is formed of a bar of plate brass, an inch and a half wide and one-eighth of an inch thick. Through this bar two triangular holes are made, at the distance of 39.4 inches from each other, to admit the knife-edges. Four strong knees of hammered brass, of the same width as the bar, six inches long, and three-quarters of an inch thick, are firmly screwed by pairs to each end of the bar, in such a manner, that when the knife-edges are passed through the triangular apertures, their backs may bear steadily against the perfectly plane surfaces of the brass knees, which are formed as nearly as possible at right angles to the bar, which is cut of such a length, that its ends may be short of the extremities of the knee-pieces about two inches. Two slips of deal 17 inches long, and of the same thickness as the bar, are inserted in the spaces thus left between the knee-pieces, and are firmly secured there by pins and screws. These slips of deal are only half the width of the bar; they are stained black, and in the extremity of each a small whale-bone point is inserted, for the purpose of indicating the extent of the arc of vibration. A cylindrical weight of brass, in diameter three inches and a half, and an inch and a quarter thick, and weighing about 2 lbs. 7 oz., has a rectangular opening in the direction of its diameter, to admit the knee-piece of one end of the pendulum. This weight being passed on the pendulum, is so thoroughly secured there by means of a conical pin fitting an opening made through the weight and knee-pieces, as to render any change of position impossible. A second weight of about seven ounces and a half is made to slide on the bar near the knife-edge at the opposite end; and this weight may be fixed at any distance on the bar by two screws with which it is furnished. A third weight, or slider of four ounces, is moveable along the bar, and is capable of nice adjustment by means of a screw fixed to a clamp, which clamp is included in the weight. This slider is designed to move near the centre of the bar; and it has an opening, through which may be seen divisions, each equal to one-twentieth of an inch, engraved on the bar; and a line is drawn on the edge of the opening to serve as an index for determining the distance of the slider from the middle of the bar. The knife-edges are made of that kind of steel prepared in India, and called wootz. Their form is triangular, and their length an inch and three-quarters. They were ground on a plane tool, so as to ensure their having a perfectly straight edge. They were then carefully finished on a plane green

hone, giving them such an inclination as to make the angle on which the vibrations are performed about 120 degrees. Before the knife-edges were hardened, each was tapped half-way through, near the extremities, to receive two screws, which being passed through the knee-pieces, drew the knife-edges into close contact with them; the surfaces of both having been previously ground together to guard against any strain which might injure their figure. For the description of the support and other apparatus of this pendulum, illustrated by drawings, and the method of determining the experiments, and certain other observations, our limits require us to refer to the Phil. Transf. for the year 1818, pt. i.

From his experiments and observations, captain Kater concludes, that the length of the pendulum vibrating seconds in vacuo at the level of the sea, measured at the temperature of 62° of Fahrenheit, appears to be

By Sir G. Shuckburgh's standard	-	39,13860	inches.
By general Roy's scale	-	39,13717	
By Bird's parliamentary standard	-	39,13842	

The latitude of the place of observation being 51° 31' 8", 4 north.

PENKRIIDGE. In 1811 this township contained 196 houses, and 923 persons; viz. 438 males, and 485 females.

PENN'S, l. 2, r. 3798. Add—Alfo, a township of Northumberland county, having 2072 inhabitants.

PENN'S Neck, l. 2, add—Upper Penn's Neck contains 1638, and the *Lower* 1163 inhabitants.

PENNSBOROUGH, EAST. Add—containing 2365 persons.

PENNSBOROUGH, West. Add—It contains 1264 persons. **PENNSYLVANIA, l. 7, add—**By the census of 1810, the number of counties is 43, the five following counties having been added; viz. Cambria, Indiana, Clearfield, Jefferson, Tioga, Potter, McKean, and the city and county of Philadelphia being separated. The number of inhabitants is stated to be 810,091, including 795 slaves. See each county, and UNITED STATES.

PENOBSCOT, l. 5, r. 1302.

PEORIA, a township of St. Clair, in the Illinois territory, having 93 inhabitants.

PEPPERELL, l. 4, r. 1333.

PEQUANOCK. Add—containing 3853 inhabitants.

PERCHLORIC ACID, in Chemistry. See CHLORINE.

PERGASITE. See MINERALOGY, *Addenda*.

PERICARDIUM, Liqueur of, Chemical Composition of. See FLUIDS, *Animal*.

PERQUIMINS, l. 5, r. 6052—2017.

PERSIA, col. 8, l. 18 from bottom, *r.* See PERSIAN *Language.* Col. 13, l. 12 from bottom, *r.* Kejer. At the end, *r.* Kinnier's.

PERSIAN GULF, &c. l. 1, for Omar r. Oman.

PERSON, l. 2, r. 6442; l. 3, r. 2573.

PERSPECTIVE, col. 4, l. 2, for plane *r.* line, and infert radial before parallel; l. 13, for parallel lines *r.* parallel planes; l. 19, for point *r.* line. Prob. xxi. Meth. 1. l. 12 and 13, the lines which should have been drawn from Q to c and d are in the plate improperly drawn from the point 3. Method 8. l. 3, *r.* representation. Method 11. l. 13, for and *a, e, r.* and *a, s.*

PERTH, col. 4, l. 23 from bottom, for 4715 *r.* 4510; and after 16,948 inhabitants, *r.* viz. 7687 males, and 9261 females.

PERTH-AMBOY, l. 11, r. 815 inhabitants.

PERTSHIRE. In 1811 this shire contained (exclusive of the town) 21,894 houses, and 116,975 persons;

viz. 55,177 males, and 61,799 females: 8500 families being employed in agriculture, and 9602 in trade, manufactures, or handicraft.

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PERU, in America. Add—Alfo, a town of Berkshire county, in Massachusetts, containing 912 persons.—Alfo, a township of Bennington county, in Vermont, having 239 inhabitants.

PERUVIAN BARK, Chemical Properties of. See CINCHONA.

PETALITE. See MINERALOGY, *Addenda*.

PETERSBOROUGH, in America, l. 3, r. 1537.

PETERSBURGH, a town of Huntingdon county, in Pennsylvania, having 194 inhabitants. Col. 2, l. 19, for Albert *r.* Elbert. At the close, add—It contains, together with the county and Elberton-town, 12,156 inhabitants; the slaves of the county being 4291, those of the town 225, and those of Elberton 58.

PETERSHAM, l. 6, r. 1490.

PETROLEUM. See MINERALOGY, *Addenda*.

PHÆNICOPHEUS, MALOKKA, in Ornithology, a genus of birds of the order PICÆ; the characters of which are, beak strong and slightly incurved; feet simple, two toes pointing forwards, and two backwards, the outward to the longest; head naked round the eyes and warted. This genus is readily distinguished from Cuculus by the naked and papillated space that surrounds the eyes, and from Polophilus by the structure of the hinder toes; the head is somewhat square, and very thick; the wings rather short, and the tail remarkably long. Shaw.

PHANAGORIA for PHANAGORA.

PHARMACOPEIA EQUINA, a dispensatory adapted to the purposes of veterinary practitioners, and designed more especially to comprehend those drugs and medicines that pertain to the diseases of the horse. Such a pharmacopœia is a desideratum in veterinary science. The drugs and preparations that are chiefly used are described, as far as our limits would allow, under their several titles on the disorders to which they are appropriated. The form under which they are most commonly administered is that of balls, under which many of them are recited, and the general method of preparing them described. Veterinary writers have arranged these balls under several denominations, founded on the medical purposes for which they are administered. Accordingly we have *alterative, purging, diuretic, cordial, astringent, restorative, and diaphoretic* balls; for the preparation of which a variety of formulæ has been given by modern practitioners.

For *alterative* balls we have the following instructions: Mr. J. Lawrence directs flowers of sulphur and cream of tartar, of each $\frac{1}{2}$ oz., 1 dr. of canella alba in powder, and treacle *q. s.*, half of which ball should be given twice a day on an empty stomach:—or, flowers of sulphur, cream of tartar, gum guaiacum and turmeric, of each 2 drs., and 1 dr. of canella alba, may be made into one or two balls with treacle, and given as above:—or, prepared antimony and gum guaiacum, of each from 3 to 4 drs. prepared with treacle, may be given every day:—or, antimonial *Ethiops*, from 4 to 6 drs., made into a ball with treacle, may be administered every night for a fortnight, and discontinuing it for a week, resumed for another fortnight; which is said to have great effect in the farcy, the mange, and obdurate dry coughs in horses. Mr. R. Lawrence recommends a ball made of 1 dr. of tartarified antimony, 1 oz. of liquorice-powder, and $\frac{1}{2}$ oz. of Venice turpentine, given

given every other night for four or five nights, for horses affected with greafe. Mr. White directs a compofition of 6 oz. of levigated antimony, 8 oz. of flowers of fulphur, mixed with treacle, to be made into 8 balls:—or, 4 oz. of powdered rofin, 3 oz. of nitre, 1 oz. of tartarified antimony, mixed with treacle, and divided into 8 balls:—or, 2 oz. of unwafhed calx of antimony, 2 drs. of calomel, and 4 oz. of powdered anifeeds, mixed with treacle, and divided into 8 dofes:—or, $\frac{1}{2}$ dr. of calomel, 1 dr. of aloes, 2 drs. of Caftile foap, 30 drops of oil of juniper, and $\frac{1}{2}$ oz. of powdered anifeeds, made into a ball with fyrup, which ferves for one dofe, and which Mr. W. calls the “mercurial” alterative. Mr. Taplin recommends levigated antimony, flowers of fulphur, and nitre, of each 3 oz., 10 oz. of Caftile foap, 3 drs. of oil of juniper, formed into a mafs with honey *q. f.*, and divided into 12 balls, and one to be given every morning for three or more weeks, in cafes of greafe, after purging with a common ball:—or, milk of fulphur, prepared antimony, cream of tartar, cinnabar of antimony, of each 5 oz., 4 oz. of Æthiops’ mineral, and honey *q. f.*, and the mafs divided into 12 balls, one of which fould be given every morning, for a month, in the farcy.

Purging balls are prepared, according to the directions of Mr. Taplin, of 1 oz. of focotorine aloes, 2 drs. of rhubarb, jalap, and cream of tartar, of each 1 dr., 2 feruples of ginger, oil of cloves and oil of anifeed, of each 20 drops, and fyrup of buckthorn *q. f.* Mr. White orders 5 drs. of focotorine aloes, 2 drs. of prepared natron, 1 dr. of aromatic powder, 10 drops of oil of caraway, with fyrup *q. f.*:—or, 7 drs. of focotorine aloes, $\frac{3}{4}$ oz. of Caftile foap, 1 dr. of ginger, and 10 drops of oil of caraway, with fyrup *q. f.*:—or, 1 oz. of focotorine aloes, 2 drs. of prepared natron, 1 dr. of aromatic powder, 10 drops of oil of anifeeds, and fyrup *q. f.* Mr. White affures us, that the fecond of his compofitions is generally fufficient for ftrong horfes, and that he has never had occafion for a more active purge than the laft. Mr. Ryding directs 6 drs. of Barbadoes aloes, 1 feruple of ginger, and foft-foap *q. f.*:—or, $\frac{1}{2}$ oz. of Barbadoes aloes, 1 dr. of calomel, and mucilage of gum arabic *q. f.* The firft he calls a mild purging ball, and the latter the mercurial purging ball. Mr. J. Lawrence directs 2 or 3 balls to be made of the following ingredients; *viz.* from 12 to 14 drs. of focotorine aloes, from 1 to 2 oz. of cream of tartar, a tea-fpoonful of powdered ginger, a table-fpoonful of olive-oil, and fyrup of buckthorn or treacle, *q. f.* Mr. R. Lawrence, for the fame purpofe, orders 9 drs. of Barbadoes aloes, and 1 dr. of ginger, to be formed into a ball with fyrup or treacle.

Diuretic balls are prepared by Mr. R. Lawrence of $\frac{1}{2}$ oz. of Venice turpentine, 2 drs. of tartarified antimony, and 1 oz. of liquorice-powder, with treacle. By Mr. White, they are made to confift of 4 oz. of Caftile foap, and powdered rofin and nitre, of each 2 oz., $\frac{1}{2}$ oz. of oil of juniper, linfeed-powder, and fyrup *q. f.* This mafs for ftrong horfes is divided into 6 balls, but for weak ones into 8:—or, the fame balls may be prepared of 4 oz. of Caftile foap, 2 oz. of Venice turpentine, and powdered anifeeds, and treacle, *q. f.* fo as to form 6 balls:—or, balls from 1 to 1 $\frac{1}{2}$ oz. are prepared, according to Mr. Ryding’s directions, of yellow rofin, Caftile foap, and Venice turpentine, of each 1 lb. diffolved flowly over the fire and formed into a mafs. Thefe balls, he fays, are excellent diuretics, and may be given in gripes, fwelled legs, greafe, or in difeafes of the eye, &c.

Cordial balls are prepared by the fame of 2 oz. of grains of paradife, finely powdered, ginger and canella alba, of each $\frac{1}{2}$ oz., anifeeds and caraway-feeds, of each 1 $\frac{1}{2}$ oz., 2 oz. of

liquorice-powder, and honey *q. f.*; to be given occasionally. By Mr. White, thefe balls are prepared by making a mafs with treacle of cummin-feeds, anifeeds, caraway-feeds, of each 4 oz., and 2 oz. of ginger; and they are given in the quantity of about 2 oz.:—or, they may be made of anifeeds, caraway-feeds, moift fennel-feeds, or liquorice-powder, of each 4 oz., ginger and caftia, of each 1 $\frac{1}{2}$ oz., made into a mafs with honey, and given in a dofe of about 2 oz.

Astringent balls are prepared by Mr. Taplin’s directions of 6 drs. of diafcordium, gum arabic, prepared chalk, and Armenian bole, of each $\frac{1}{2}$ oz., 1 dr. of ginger, 40 drops of oil of anifeed, with fyrup *q. f.*; they are given in cafes of laxnets or fcouring, and repeated every 6, 8, or 12 hours, as the cafe may require. For this purpofe balls may be prepared of rhubarb, and compound powder of gum tragacanth, of each $\frac{1}{2}$ oz., columbo and ginger, of each 1 dr., 15 grs. of opium, 6 drs. of orange-peel, and fyrup of poppies; the ball to be repeated in 12, 18, or 24 hours:—or, 1 oz. of mithridate, Armenian bole, gum arabic, and prepared chalk, of each $\frac{1}{2}$ oz., 2 drs. of ginger, and fyrup of poppies, may form a ball.

Reftorative ball is formed, according to Mr. Ryding, of $\frac{1}{2}$ lb. of Peruvian bark, 2 oz. of grains of paradife, gentian, and columbo, of each 3 oz., and honey *q. f.*; the mafs is to be divided into 16 balls, and one to be given every morning in cafes of indigefion or lofs of appetite. Mr. Taplin directs a ball for this purpofe to be made of 4 oz. of Peruvian bark, 2 oz. of mithridate (or diafcordium), canella alba, fnake-root, and camomile, of each, in powder, 1 oz., or formed into a mafs with honey *q. f.*, and divided into 6 balls, one to be given night and morning:—or, $\frac{1}{2}$ oz. of Venice treacle, 6 drs. of Peruvian bark, columbo, and camomile, of each 2 drs., 25 drops of oil of caraway, and honey *q. f.*

Diaphoretic balls are formed, according to Mr. White’s directions, of 1 dr. of opium, 2 drs. of camphor, 3 drs. of tartarified antimony, $\frac{1}{2}$ oz. of powdered anifeeds, and fyrup *q. f.*

PHASIS, l. 9, inferit—it is at the town of Serpanta that it becomes navigable, and after collecting the freams of the plain of Mingrelia, it enters the Black fea. It purfues a courfe of 500 miles, 40 of which are navigable for large veffels. At its difcharge into the fea, it has a fmall woody ifland in the midft of the channel.

PHASMA, in *Entomology*, a genus of infefts formed from fome of the Linnæan Mantes, and differing from that genus in having all the legs equally formed for walking, and without the falciform joint that diftinguifhes the fore-legs in mantes. The characters are, head large, antennæ filiform, eyes fmall, rounded; ftemmata three, between the eyes; wings four, membranaceous; the upper pair abbreviated, the lower pleated; and feet formed for walking. They feed entirely on vegetable food. The moft remarkable is the *P. gigas* or *M. gigas* of Linnæus. It is a native of the ifland of Ambonia. Another extraordinary fpecies is the *P. dilatatum*, defcribed in the 4th volume of the Tranfactions of the Linnæan Society. Some infefts of this genus, as well as thofe of the mantis, have their upper wings refembling the leaves of trees; nature having thus provided for their fecurity againft the attacks of birds, and as well as for the more ready attainment of their prey. The female of the *P. fucifolium* has no under wings.

PHILADELPHIA, l. 6, r. 19; l. 7, r. contained, in 1810, 57,488 inhabitants. Add—Alfo, the metropolis of Pennsylvania, and now a diftinct county, containing 14 wards, and, by the cenfus of 1810, 53,722 inhabitants.

PHILADELPHIA *Stones*, l. 3, after city, add—in Africa.

PHILIPSBURG, a town of York county, in Maine, with 1427 inhabitants.

PHILOSOPHER'S STONE, l. 23 from the end, *r.* should not encourage.

PHLOGISTON, l. 19, *r.* now said to be separated.

PHOCA, l. 4, *r.* fix (or four, Shaw.)

PHOSPHATE of Copper, in *Mineralogy*. See MINERALOGY, *Addenda*.

PHOSPHORITE. See MINERALOGY, *Addenda*.

PHOSPHORUS, *Phosphoric Acid*, *Phosphates*, &c. in *Chemistry*. According to the most recent determination of Dr. Thomson, the weight of the atom of phosphorus is 15, that of phosphorous acid 25, and that of phosphoric acid 35. A good deal of doubt, however, still hangs over this principle and its compounds. The *hypophosphorous acid*, discovered by Dulong, and which is formed when phosphuret of barytes is dissolved in water, appears to contain less oxygen than either the phosphorous or phosphoric acid, and was formerly considered as the *protoxyd* or first compound of phosphorus and oxygen. Dr. T., however, is latterly disposed to consider the *hypophosphorous acid* as a compound of 2 atoms phosphorus + 1 atom oxygen; but this is by no means ascertained. We may also observe, that all the best analyses of the phosphates shew that the weight of the atom of phosphoric acid lies between 40 and 45.

We may mention here, that Dulong has observed an acid formed during the slow combustion of phosphorus, composed, as he supposes, of 1 atom phosphorous acid + 1 atom phosphoric acid, and which he has named *phosphatic acid*.

PHRYGIA MINOR, l. 6, *r.* N.W.; l. 26, *r.* Alexandria-Troas. Col. 3, l. 8, *r.* Podarces.

PICÆ. At the clofe, add—See AVES, CLASSIFICATION, and NATURAL History.

PICROLITE. See MINERALOGY, *Addenda*.

PICROMEL, in *Chemistry*. See BLEU.

PIGMENTS. Add—The results of fir Humphry Davy's late experiments on the colours used by the ancients as pigments are as follow. The red colours which they employed he found to be red-lead, vermilion, and iron ochre. The yellows were yellow ochre, in some cases mixed with chalk, in others with red-lead. The ancients likewise used orpiment and mafficot as yellow paints. The blue was a pounded glass, composed of soda, silica, lime, and oxyd of copper. Indigo was likewise employed by the ancients, and they coloured blue glass with cobalt. The greens were compounds containing copper; sometimes the carbonate mixed with chalk; sometimes with blue glass. In some cases, they consisted of the green-earth of Verona. Verdigris was likewise used by the ancients. The purple colour found in the baths of Titus, was an animal or vegetable matter combined with alumina. The blacks were charcoal; the browns ochres; the whites chalk or clay. White-lead was likewise known to the ancient painters.

PILKINGTON, l. 1, after Lancashire, add—in the hundred of Salford, and parish of Prestwick, containing 7353 persons, occupying 1196 houses, of whom 1223 are employed in trade and manufactures, and 166 in agriculture.

PILLORY. This kind of punishment is now abolished in England.

PITCH-STONE. See MINERALOGY, *Addenda*.

PITT, in America, l. 2, add—of whom 3589 were slaves in 1810.

PITSTOWN, Add, at the clofe—containing 694 persons.

PITTSYLVANIA, l. 2, add—of whom 6312 were slaves.

PLANE-TREE, for PLANTANUS *r.* PLATANUS.

PLANET, col. 20, l. 6 from bottom, for 365 days, hours and minutes, *r.* 365 days.

PLANETARIUM, col. 20, l. 34 from bottom, for Jupiter's *r.* Saturn's. Col. 23, l. 15 from bottom, for 23° 32' 59" *r.* 23° 30' 59".

PLAQUEMINA, in *Geography*, a parish of the county of Orleans, in the territory of Orleans, containing 1549 persons. The soil of this parish is well adapted to the cultivation of the sugar-cane, and some of the largest sugar estates yet formed on the Mississippi are within its limits, so that sugar is its staple commodity. The important port of fort St. Philip is one of the defences of Louisiana.

PLASNIA. See MINERALOGY, *Addenda*.

PLATINUM, in *Chemistry*. Dr. Thomson concludes, from the best experiments that have been made on this metal and its compounds, that the weight of its atom is 226.25.

PLATYSTACUS, in *Ichthyology*, a genus of abdominal fishes, instituted by Dr. Bloch, and nearly allied to that of Silurus. Its generic characters are, that it has the habit of silurus, mouth beneath, bearded with cirri, body scaleless, depressed, tail long, compressed. Dr. Shaw enumerates and describes the following species, *viz.* *cotylephorus*, with six beards, and ventral acetabula, the *Silurus aspredo* of Linnaeus, a native of the Indian seas and rivers: *levis*, with eight beards and smooth abdomen, differing perhaps only in size from the former: *verrucosus*, or warted brown P. marked above by longitudinal warted lines, with short anal fin, similar to the last, but smaller and of a less elongated form; a native of the Indian seas: *anguillaris*, or eel-shaped brown P., with longitudinal white stripes, and the second dorsal, anal, and caudal fin united, form less broad in front than that of the preceding species, having eight instead of six beards; a native of the Indian seas.

PLEASANT, in *Geography*, l. 2, *r.* 1246. Add—Also, a township in Franklin county, having 159 inhabitants.

PLEASANT, *Mount*. Add—a township in Madison county, having 328 inhabitants.

PLUMSTEAD, l. 2, in Bucks county, having 1407 inhabitants.

PLUTONIUM, in *Chemistry*, a name given by Dr. Clarke to the supposed metallic basis of barytes. See BARYTES and BLOW-PIPE.

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POGONIUS, in *Ornithology*, a genus of birds of the order PICÆ; the characters of which are, beak large, thick, ciliated at the base, with the upper mandible bidentate on both sides, nostrils covered with bristles, feet simple, with two toes before and two behind. Of this genus there are three species, all inhabitants of Africa; *viz.* *sulcirostris*, or groove-beaked, the blue-black P. with throat, neck, belly, and an obscure stripe on the wings, scarlet, sides yellowish, back with a white spot, quills dark-brown, upper mandible with one longitudinal, under with many transverse, grooves; inhabits about the coast of Barbary: *levisrostris*, or smooth-beaked black P., with throat, neck, breast, abdomen, and a stripe on the wings, scarlet, back with a white spot, crown of the head variegated with scarlet; beak smooth, not grooved; the bucca dubius B. of Latham: *vicilloti*, or brown P., whitish beneath, head, neck, throat, and spots on the breast, scarlet; interior wing-quills externally marginal with pale; beak smooth, not grooved. Shaw.

POINT,

POINT, in *Geography*, a township of Northumberland county, in Pennsylvania, having 431 persons.

POINTE COUPEE, a county and parish of New Orleans, containing 4539 persons.

POIRET. See THEOSOPHISTS.

POISON, col. 3, l. 15 from bottom, for verus *r.* berus.

POLAND, col. 9, l. 31, add—From a statistical account of Poland, published at Warfaw, it appears, that this kingdom in its present state contains 1291 square miles, (of 15 to a degree,) 481 towns, 22,694 villages, and a population of 2,732,324 persons, of whom 219,244 are Jews.

POLAND, in America, col. 2, l. 2, *r.* 850. Add—Also, a township of the county of Trumbull, in Ohio, with 827 inhabitants.

POLARITY of Light. See LIGHT.

POLARIZATION, in *Optics*, a term which has been lately applied to that change which takes place in the direction of rays that pass through certain crystals, and which derives this appellation from its analogy to magnetic phenomena. It was first suggested by the modifications of light discovered by M. Malus (see LIGHT), and has since been investigated with equal ingenuity and diligence by Dr. Brewster. For his numerous communications on this subject to the Royal Society, he was honoured with the Copley medal.

POLASKI, in *Geography*, a county of Georgia, containing 2091 inhabitants, of whom 528 were slaves in 1810.

POLE, l. 2, add—the fourth son of the countess of Salisbury, who was cruelly and unjustly beheaded by Henry VIII., and whose father, the duke of Florence, was drowned in a butt of malmsey by his son.

POLOPHILUS, COUCAL, in *Ornithology*, a genus of birds of the order PICÆ; the characters of which are, beak strong, slightly incurved, nostrils straight, elongated, feet simple, two toes pointing forward, the exterior being the largest, two toes turning backwards, the interior furnished with a very long claw. The Coucals, so first called by Vaillant, form a most beautiful tribe of birds. They reside in woods, feed on insects and fruits, and construct their nests in trees, and (contrary to the manners of cuckoos) bring up their young, from which circumstance their generic name is derived. Shaw.

POLYPTERUS, in *Ichthyology*, a genus of the abdominal fishes; the character of which is, that the gill-membrane is single-rayed, and the dorsal fins numerous. This fish constitutes a new and remarkable genus, and was first scientifically described by M. E. Geoffroy, who considered it as forming a connecting link between the osseous and the cartilaginous fishes. It seems most nearly allied to the genus Elox. It is known to the Egyptians by the name of Bichir, among whom it is rare, and supposed in general to inhabit the depths of the Nile among the soft mud. Its flesh is white and savoury, though it is hardly possible to open its skin with a knife; and therefore the fish is first boiled, and its skin drawn off whole. Its specific name is "Niloticus," and it is characterized as the green P., with the abdomen spotted with black. Shaw.

PONT-VOLANT, *dele* the description, and let the reference remain.

PORANTHERA, in *Botany*, from πορος, a pore, and ανθη, an anther.—Rudge Tr. of Linn. Soc. v. 10. 302.—Clas and order, *Pentandria Trigynia*. Nat. Ord.

Eff. Ch. Involucrum of eight leaves, many-flowered. Perianth none. Petals five. Anthers of four cells, each

with a terminal orifice. Capsules? three, with numerous seeds.

1. *P. ericifolia*. Rudge as above, t. 22. f. 2.—Native of New South Wales. *Dr. White*. A very extraordinary little plant. Stem branched, round, leafy, four to six inches high. Leaves scattered, numerous, linear, glaucous. Flowers corymbose, minute, white. The dried specimens resemble some small kind of *Lepidium*.

PORCELAIN, col. 24, l. 31, *r.* in a melted state.

PORCELAIN *Jasper*. See MINERALOGY, *Addenda*.

PORCELLIA, in *Botany*, so called by Ruiz and Pavon, in honour of Don Antonio Porcel, a Spaniard, whom they celebrate, in the highest terms, as a promoter of botanical pursuits. Our reasons for adopting this name, in preference to any other, for the genus we are about to describe, may be found under the article ASIMINA. That we presume to consider the *Asmina* and *Porcellia* of De Candolle as one and the same genus, may require a still further apology, and we shall presently give it, as far as we are able.—"Ruiz et Pavon Fl. Peruv. v. 1. 144. Prodr. 84. t. 16. Dunal Anonac. 85." De Cand. Syst. v. 1. 480. "Perf. Syn. v. 2. 95." Pursh 383. (*Asmina*; Adans. Fam. v. 2. 365. Dunal Anonac. 81. De Cand. Syst. v. 1. 478. *Orchidocarpum*; Michx. Boerl.-Amer. v. 1. 329. Annonæ spec. Linn. Juss. Gen. Willd. Ait. &c.)—Clas and order, *Polyandria Polygynia*. Nat. Ord. *Coadunate*, Linn. Anonæ, Juss. *Anonacæ*, De Cand.

Gen. Ch. Cal. Perianth inferior, of one leaf, in three deep, equal, ovate, concave, permanent segments. Cor. Petals six, unequal, in two rows, sessile, ovate-oblong, spreading, coriaceous; the three innermost either larger or smaller than the rest. Stam. Filaments scarcely any; anthers very numerous, nearly sessile on the convex receptacle, oblong, bursting at each side. Pist. Germens from three to six, ovate-oblong, sessile; styles none; stigmas obtuse. Peric. Berries as many as the germens, sessile, crowded, ovate or nearly cylindrical, more or less succulent, of one cell. Seeds numerous, elliptic-oblong, ranged transversely in a single or double row, inserted into the inner margin.

Eff. Ch. Calyx inferior, deeply three-cleft. Petals six, ovate-oblong, spreading, in a double row, unequal. Germens oblong. Stigmas sessile, obtuse. Berries sessile, of one cell, with many seeds.

A shrubby or arborecent genus, with oblong, undivided, deciduous leaves, and axillary, nearly solitary flowers, either sessile or stalked, in some instances expanded before the foliage. All the species are natives of the cooler parts of America. The able professor De Candolle separates *Asmina* of Adanson from *Porcellia* of the *Fl. Peruv.*, the latter having its three inner petals rather the largest, the fruit more cylindrical and coriaceous, the seeds in a double row. In *Asmina* the three outer petals are much the largest, and the fruit more ovate. But the seeds are likewise in a double row in one species at least of this genus, the *triloba*, as De Candolle, on the authority of Ehret, admits; and the comparative size of the inner and outer petals, different in different species of *Asmina*, can hardly be much relied on, nor is this admitted by De Candolle among his most essential characters, p. 465. The more or less cylindrical or ovate form of the fruit will not, surely, be insisted on; nor can that of the original *Porcellia* differ essentially in substance from the others, being like them succulent and eatable.

1. *P. nitidifolia*. Shining-leaved Porcellia. "Fl. Peruv. v. 1. 144." De Cand. n. 1.—Leaves ovate-lanceolate, pointed, smooth on both sides. Flower-stalks aggregate. Inner petals rather the largest.—Native of mountainous

tainous woods in Peru. A tall and very handsome tree, forty ells in height, with greyish, rugged, minutely dotted branches. Leaves alternate, on short stalks, oblong-lanceolate, rounded at the base, entire, veiny on both sides, shining above. Stalks axillary, several together, drooping, thickened upwards, each bearing one or more yellowish-white flowers, about an inch in diameter. Berries cylindrical, tumid, rather coriaceous, but juicy and eatable, each marked externally with a longitudinal seam. Seeds oblong-kidney-shaped, compressed, in two rows. The leaves afford a yellow dye.

2. *P. parviflora*. Small-flowered Porcelia. Pursh n. 2. (*Afimina parviflora*; De Cand. Syft. v. 1. 478. "Dunal Anonac. 82. t. 9." *Orchidocarpum parviflorum*; Mich. Boreal.-Amer. v. 1. 329.)—Leaves obovate-wedge-shaped, pointed, clothed with rusty down beneath, as well as the young branches. Flowers sessile. Outer petals longest, scarcely twice the length of the calyx.—In shady woods, near rivers and lakes, from Virginia to Georgia, flowering in April and May. A low shrub, sometimes not above two feet high when in full fruit. Flowers small, dark purple. *Pursh*. Branches smooth, slightly rugged; when young leafy, and covered with reddish pubescence. Leaves on very short stalks; acute at the base; ribbed and downy beneath; smooth and green above. Flowers nearly or quite sessile, coming before the leaves, from the axillary scars of last year's foliage. Their stalks, if any, as well as the outfiles of the calyx and corolla, are clothed with reddish down. Berries two or three from each flower, aggregate, ovate, smooth, rather fleshy, "the size of a plum." De Candolle.

3. *P. triloba*. Three-lobed Porcelia. Pursh n. 1. (*Afimina triloba*; De Cand. Syft. v. 1. 479. "Dunal Anon. 83." *Annona triloba*; Linn. Sp. Pl. 758. Willd. Sp. Pl. v. 2. 1267. Ait. Hort. Kew. v. 3. 335. *A. foliis lanceolatis, fructibus trifidis*; Mill. Ic. v. 1. 23. t. 35. *A. fructu lutescente levi, ferotum arietis referente*; Catesb. Carol. v. 2. t. 85. Trew Ehret t. t. 5. Duham. Arb. v. 1. 56. t. 19, 20. *Orchidocarpum arietinum*; Mich. Boreal.-Amer. v. 1. 329.)—Leaves elliptic-oblong, pointed at each end, nearly smooth, as well as the young branches. Flowers stalked. Outer petals roundish-ovate, four times the length of the calyx.—On the overflowed banks of rivers, from Pennsylvania to Florida, flowering in March and April. A small tree. Flowers dark brown. Fruit large, eatable. *Pursh*. This species, introduced by the celebrated Peter Collinson, is still met with in several curious gardens, like those of Kew, Stion-house, &c. where it produces in the spring large inodorous flowers, an inch and a half broad, with wrinkled dark-brown petals, as represented by Miller. Catesby and Ehret make them of a pale yellowish-green. The leaves, which come forth as the flowers begin to fall, are five or six inches long, and an inch and a half or two inches broad, on short stalks. The flower-stalks are solitary and single-flowered, from one to two inches long, downy with purplish hairs. Berries ovate, yellow, two or three inches long, not perfected in England, eatable, though reported by some persons to have an unpleasant smell. Seeds eight or ten, large, brown, rugged, in a double row, as represented by Ehret. Miller's figure exhibits a single row only. One or two berries only appear to be perfected from each flower.

4. *P. pygmaea*. Dwarf Porcelia. Pursh n. 3. (*Afimina pygmaea*; De Cand. Syft. v. 1. 479. "Dunal Anonac. 84. t. 10." *Orchidocarpum pygmaeum*; Mich. Boreal.-Amer. v. 1. 330. *Annona pygmaea*; Bartr. Trav. t. 1. Willd. Sp. Pl. v. 2. 1268.)—Leaves oblong-lanceolate,

obtuse; wedge-shaped at the base; smooth, as well as the young branches. Outer petals largest, obovate-oblong, greatly exceeding the calyx.—In the sandy fields of Georgia and Florida. The whole shrub not above a foot high. Flowers the size of *Annona squamosa*. *Pursh*. This is smooth in every part, with very long leaves, and short, single-flowered, solitary, bracteated flower-stalks. Flowers white; their inner petals smallest, elliptical and obtuse. De Candolle. *Pursh*, by a faulty punctuation, makes the inner petals longest.

5. *P. grandiflora*. Large-flowered Porcelia. Pursh n. 4. (*Afimina grandiflora*; De Cand. Syft. v. 1. 480. "Dunal Anonac. 84. t. 11." *Orchidocarpum grandiflorum*; Mich. Boreal.-Amer. v. 1. 330. "Annona grandiflora; Bartr. Trav. t. 2." *A. obovata*; Willd. Sp. Pl. v. 2. 1269.)—Leaves obovate-wedge-shaped, obtuse; clothed beneath with rusty down, as well as the young branches. Flowers sessile. Outer petals obovate, many times larger than the calyx.—In shady woods, of Georgia and Florida, flowering in May. A small shrub. Flowers very large in proportion, white. *Pursh*. Older branches smooth, as well as the upper surface of the leaves. Inner petals linear-oblong. Berries smooth, oblong-obovate. De Candolle.

PORTER, in Geography, a small township of the district of Maine, in the county of Oxford, having 292 persons.

PORTLAND, NEW, a township of Maine, in the county of Somerset, having 421 inhabitants.

PORTSBOROUGH. In 1811, the parish of St. Cuthbert's contained 1958 houses, and 38,673 persons; viz. 16,873 males, and 21,800 females: 210 families being employed in agriculture, and 3342 in trade, manufactures, or handicraft.

POTSMOUTH, col. 5, l. 20, for tons *r.* cwt.

POTASSIUM, POTASH, in Chemistry. The most recent determinations make the weight of the atom of potassium to be 50, and that of potash of course to be 60. Potassium, when heated in oxygen gas, combines with a larger quantity of oxygen than exists in potash, and thus forms a compound which is, in fact, a peroxid of potassium. This peroxid is of a yellow colour; and when put into water it effervesces, giving off oxygen gas. Phosphorus, sulphur, and carbon, are acidified when brought in contact with it. Hydrogen, when heated with it, is slowly and without combustion converted into water. It decomposes ammonia, converting it into water and azotic gas.

POTT, PERCIVAL, col. 2, l. 27, for 1726 *r.* 1736.

POTZDAM. Add—Potzdam contains (the military not included) 115,426 souls.

POULTICE, in Farriery, is compounded of various ingredients, according to the purposes of its application. Some of the most approved, founded in modern veterinary science, are the following:—The common poultice consists of $\frac{1}{4}$ peck of bran and water, *q. f.* boiled for ten minutes, and then thickened with linseed-meal, having the addition of 3 oz. of hog's-lard: or, $\frac{1}{2}$ peck of fine pollard, 2 $\frac{1}{2}$ lbs. of linseed-meal, and boiling water, *q. f.* adding 2 oz. of hog's-lard. Fermenting poultice is obtained by boiling a quantity of brewer's wort, and throwing into it as much oatmeal as will thicken it; adding, lastly, a tea-cupful of yeast: this is adapted to putrid ulcers, or mortified parts. Saturnine poultice is had by adding to the common poultice 3 drs. or $\frac{1}{2}$ oz. of extract of lead, and mixing them well together: or, 1 oz. of acetated ceruse, (sugar of lead,) 3 quarts of boiling water, with the addition of bran and linseed-meal, *q. f.* A suppurative poultice may be made by stirring a sufficient quantity of common turpentine into some

some of the common poultice. An *anodyne* poultice may be prepared in the same way, by adding a sufficient quantity of tincture of opium.

POWATAN, l. 1, r. 8073 inhabitants, of whom 5091 were slaves in 1810.

POYANG, l. 2, add—According to a statement in “Ellis’s Journal of an Embassy to China,” (vol. ii.), this lake is very inferior in extent to the Tung-ting-hoo, in Ho-quang, the one being 180 leas, and the other 800 acrols; the lee being rather more than one-third of a mile.

POWDER-CHESTS, l. *penult.* for fixed r. fixed.

PRAIRIE, or MEADOW, a term used in North-West America, to denote a tract of land divested of timber. In travelling W. from the Alleghanies, such tracts occur more frequently, and are of greater extent as we approach the Mississippi. When we proceed to the distance of 2 or 300 miles to the west of that river, the whole country is of this description, which continues to the rocky mountains westward, and from the head waters of the Mississippi to the gulf of Mexico, an extent of territory which probably equals in area the whole empire of China.

PREBBLE, in *Geography*, a county of Ohio, containing 7 townships, and 8304 inhabitants.

PREHNITE. See MINERALOGY, *Addenda*.

PRICE. See POLITICAL Economy.

PRINCE EDWARD, l. 2, after inhabitants, add—of whom 6996 were slaves in 1810.

PRINCE George, l. 3, insert—of whom 4486 were slaves in 1810.

PRINCE George, l. 5, insert—of whom 9189 were slaves in 1810.

PRINCE William, l. 3, add—of whom 5220 were slaves in 1810.

PRINCESS ANNE, l. 4, insert—of whom 3926 were slaves in 1810.

PRINTING, CALICO, is the art of imparting various colours to plain calicoes, in any form, or according to any pattern that may be desired, by means of certain colourless mordants previously applied to the cloth. This art has sometimes been denominated *topical dyeing*, and the various branches of it are calculated to astonish those who may have the opportunity of witnessing the different processes, without being acquainted with the nature of chemical mordants, and their several uses in the arts.

The art of calico-printing is of great antiquity. Homer speaks of the variegated cloths of Sidon, as having a very splendid appearance; and Pliny describes the Egyptians as accustomed to prepare parti-coloured linens, and observes that these colours were produced after a manner corresponding with our method of topical dyeing. He says the Egyptians began by painting or drawing on white cloths, (doubtless linen or cotton,) with certain drugs, which in themselves possessed no colour, but had the property of attracting or absorbing colouring matters. After which, these cloths were immersed in a heated dyeing liquor; and though they were colourless before, and though this dyeing liquor was of one uniform colour, yet when the cloths were taken out of it soon after, they were found to be wonderfully tinged of *different* colours, according to the different natures of the several drugs, which had been applied to their different parts; and these colours, so wonderfully produced from a tincture of only *one* colour, could not afterwards be discharged by washing; and he considers it as admirable, that the dyeing liquor, which, if cloths of different colours had been put into it, would have confounded them all, should thus produce, and permanently fix *several* colours, being itself only of one colour. Pliny, lib. xxxv. cap. 2.

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This account contains for plain a description of one of the branches of calico-printing, that no one who is conversant with the present practices can entertain any doubt but that the ancient Egyptians were acquainted with many of the principles of this very curious art. Our readers, who are desirous of further investigating this interesting subject, will find abundant and satisfactory information by consulting the following works: *viz.* Pliny’s “Natural History;” the 26th volume of “Recueil des Lettres Edifiantes, &c.” Strabo, lib. xv.; Delaval’s “Experimental Inquiry into the Cause of Change of Colours, in opaque and coloured Bodies;” Berthollet’s “Elements of the Art of Dyeing;” vol. i. p. 28; Beckman’s “History of Inventions;” in 4 vols. 8vo.; Mr. Parkes’s “Chemical Essays,” vol. ii. p. 65, &c.; and Dr. Bancroft “On Permanent Colours.” In the above works, abundant testimonies will be found to shew that printed calicoes were not unknown to the ancients; and we have good reason also to suppose that the colours which they imparted to their cloths possessed a considerable degree of permanency, as we know that iron and alum were both employed by them as mordants. It is likewise well known that several ancient nations were acquainted with soda, madder, tin, the juice of the *buccinum*, cochineal (or an insect similar to it), the celebrated Tyrian purple, and other materials, sufficient in the whole to enable them to give a great variety of colours and tints to their several productions.

Our object, however, in this communication, is to give a succinct account of the art of calico-printing as it is conducted at present, and we do not know that we can do better than to copy the greater part of the detail which has been given by Mr. Parkes in his “Essay on Calico-Printing;” in the second volume of his “Chemical Essays;” and which he has very politely allowed us to make use of in any way we think proper.

From this essay it appears, that calico-printing, as an art, is but of modern date in this country, though it has been practised in India, and other parts of the East, from time immemorial. From various accounts it appears, that formerly in India the cotton cloths when brought from the weavers, partly bleached, were worn next to the skin by the dyer and by all his family, during the space of eight or ten days, after which they underwent several macerations in water, with goat’s dung, and were afterwards submitted to frequent washings, and as frequent dryings in the rays of an intense sun-shine. Afterwards they were soaked for some time in the mixture of the astringent fruit of the yellow *myrobalans*, and of curdled buffalo’s milk. When thoroughly impregnated therewith, they were squeezed, dried by exposure to the sun, and then, by pressure and friction, they were made smooth enough for being drawn upon by the pencil with the different mordants.

The first of these mordants was an iron liquor, made by dissolving iron in a mixture of four palm-wine and of water in which rice had been boiled. This liquor was applied to the figures or spots intended to become black, and afterwards the aluminous mordant was applied, commonly by children, with the pencil, to the parts intended to be made red. The pieces were then exposed to the hottest sun-shine, that the parts to which the mordants had been applied might be dried as much as possible: and then they were thoroughly soaked in pits of water, to cleanse them from the superfluous mordants, as well as from the buffalo’s milk, &c. and lastly, they were dyed in water, with certain roots answering nearly in their effects to those of madder.

It was in this way the manufacture of printed cottons

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was conducted by the Indians in former times. The following is an account of the modern Indian practice, in one particular branch of their manufacture, which Mr. Parkes says he procured from a gentleman who had spent some time in India, and who had taken pains to inquire into their manipulations.

This process relates to the method of printing the fine cotton chintz counterpanes, which the natives call *pallampoors*, and which are manufactured at Madras. These are woven in one piece, from two to four yards square, and are printed, or rather painted, with various designs, and in various colours. Their method is to draw a pattern first on sheets of paper sewn together, of the size of the intended pallampoor; and then to prick out the same in the paper with a sharp instrument. This done, the paper pattern is smoothly fixed upon the cloth, which is previously damped, and a small muslin bag containing some kind of black powder is rubbed over the whole, in order to pass a part of the powder through the pin-holes, and completely mark out the pattern.

The pattern being thus sketched upon the cloth, the paper is removed; and when the outline of the various figures is drawn with a pencil, the piece is considered to be ready for receiving the colours.

One colour is then laid on with a brush made with a tough root of a particular kind of tree, or with the husk of the cocoa-nut; and when this is dry, the piece of cotton is given to a woman to wear, or to use in the family, till it be very much dirtied; in order that it might necessarily undergo a thorough washing, which is thought requisite to prove the goodness and permanency of the colour. Another colour is then laid on in the same manner, and the piece is again submitted to the same trial of wearing and washing. The Asiatics may not be aware of it; but doubtless the long exposure to the air in these cases is the important point, as it is well known that the atmosphere is a prime agent in rendering many colours permanent, which, under a different treatment, would be heavy and fugitive. This is repeated for every colour that is employed;—and when any one of these colours is found to be deteriorated by this treatment, it is printed afresh; and so are all the rest, till the workman is satisfied that all the colours are actually permanent.

This tedious process is adopted, however, only when the manufacturer means to warrant the article; but in all cases, even in those pieces which will not bear washing, the colours are laid on by a brush, as before mentioned.

Whether they are all substantive colours which are thus applied, or whether they use any species of mordants in their fast work, we are unacquainted, as the artists of India observe great secrecy, and are extremely jealous on this subject.

Such are the facts which we have been able to collect respecting the progress of calico-printing from the earliest ages; and also of the present state of the art among the Asiatics. The more difficult part now remains, *viz.* to give a brief detail of the most important processes of our own artists. This, however, we shall endeavour to do with the utmost plainness, and shall not fail to suggest any improvement that may have occurred to us during our inquiries respecting this very interesting and varied branch of manufacture.

We have not been able to ascertain when calico-printing was introduced into this country, though there are various reasons for believing that it is an art, among us at least, but of modern date.

As the whole of this ingenious business, as it is now

conducted, depends upon the proper application of a few compounds called *mordants*, it will be necessary, in the first place, to explain their nature and uses. In doing this, one or two preliminary remarks will assist us.

The colouring substances chiefly employed in this art are divided into two classes, *viz.* *substantive* and *adjective*. A *substantive* colour is one which is capable of itself of producing a permanent dye on wool or woollen cloth; such is the juice of the buccinum, used by the ancients for producing the imperial purple; such are also the woad and indigo employed by the moderns for producing a permanent blue; and we may add the metallic solutions, particularly those of iron, cobalt, gold, platina, and silver, which give various colours, according to the processes by which they are prepared.

It has been proposed to employ this valuable permanent colour for pencilling on fine muslins. In time of peace it might readily be procured in sufficient quantities, and would prove an important addition to the resources of the British calico-printer.

Dr. Bancroft tells us, that the first mention of indigo, as known in England, is in the Act of the 23d of queen Elizabeth, chap. 9, where it is called *Anch.* or *Blue Ind.* Bancroft on Permanent Colours, p. 138.

By *adjective* colours are meant all those which are incapable of giving permanent dyes without the aid of certain intermedia, which form as it were a bond of union between them and the substances intended to be dyed.

These intermedia are what are known by the term *mordants*, and are used for this purpose in very considerable quantities by the calico-printer of the present day.

Several expedients of this kind were employed by the ancients to produce fast, or, more properly, permanent colours, and this appears from the testimony of Aristotle and Pliny. The chief articles in use at present are, the acetate of iron, the acetate of alumine, and the various solutions of tin, all of which should be very carefully and correctly prepared.

We have already given some account of chemical mordants in vol. xxiv. part 1, under the article *MORDANTS*; which see.

When piece-goods are designed to be dyed of one uniform adjective colour, they are first immersed in a solution of one of these mordants, then hung up to dry, and to absorb the oxygen of the atmosphere. When sufficiently exposed to the air, they are washed or dugged, to remove the superfluous mordant; that is to say, that part of it which is not chemically combined with the cloth; and the goods are then submitted to a bath of that particular kind of colouring matter which is to be imparted to them.

The dung of the cow is used in such large quantities by the calico-printer, that it has become an article of great expence. The proportion that is employed is usually about one bushel to one hundred gallons of water, though frequently a larger proportion would be more effectual. The brightness of the colours, and the purity of the whites, are always dependent upon the quantity of the dung employed.

Whenever it is meant that the colour should be partially inserted, the mordant is applied to those particular parts only; so that, when the piece is immersed in the colouring bath, no other place will receive the permanent stain. If a sufficient number of colouring substances should ever be discovered, that have no affinity for any thing but the chemical mordants, the business of calico-printing would be rendered much more easy and simple than it is at present. For though the whole texture of the cloth will be coloured,

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yet having in itself no affinity with the vegetable with which the decoction is impregnated, the whole of the colouring matter will be easily removed by exposure to the air, and the ground of the piece restored to its original whiteness; while those parts to which the mordant was applied, will retain and fix the colours in a way which will be more fully explained hereafter.

Formerly all calico-printers were bleachers; but in the neighbourhood of London these are separate and distinct trades, and the printer either purchases bleached goods for printing on his own private account, or receives the cloth from his customers in a white state; and, when printed, he returns the identical pieces, and is paid so much *per yard*, according to the number of colours, for printing them.

In our opinion every printer should bleach his own goods, for it is impossible always to rely with confidence on the care of those who bleach for hire; and every printer knows that good bleaching is absolutely a necessary preliminary in the production of good printing. Indeed, this is now pretty generally acknowledged in the north of England; for most of the opulent houses in Lancashire and in Scotland, which produce fine work, are bleachers as well as printers.

Oxymuriate of lime is the agent generally employed in bleaching; but it appears to us that some other article might be introduced with advantage. For, as the goods are washed in diluted sulphuric acid when they are taken from the oxymuriate of lime, a sulphate of lime is always formed, which becomes fixed in the fabric, and, acting as a mordant when the pieces come into the madder-copper, occasions an indelible stain, which in very fine goods often impairs their beauty. If oxymuriate of soda were employed, the sulphuric acid would form a soluble salt with the soda, easily removable by washing.

No people have taken more pains to excel in bleaching than the Irish, and their credit is established accordingly. The German linen, we believe, is generally better than theirs; but the Irish has always the preference in foreign markets, owing to their superiority in bleaching and finishing.

A very minute account of the various processes in bleaching has been already given in our 4th vol. part ii. under the article BLEACHING; which see.

By whatever means the bleaching is performed, the printer commences his part of the business in the following manner.

The goods are first *dressed* by singeing off the whole of the nap which is attached to them. This is effected by the following contrivance:—Ten pieces are generally wired together, and wound upon a roller, from whence they are passed over a hot iron, nearly in the form of half a cylinder, and received upon another roller; from thence they are returned to the iron, which is still kept red, or nearly at a white heat. The use of repeating this process is to remove the nap more effectually than it would be done by passing it only once over.

The next operation is that of *steeping*, which consists merely in soaking the pieces for twenty-four hours in a vessel of weak alkaline ley, at a temperature of about 100°. These operations of singeing and steeping are going on at one and the same time, which effectually prevent any accident that might otherwise arise from the effects of the hot iron.

The goods are then boiled or else bowked in a solution of potash (some workmen prefer to have this alkali in a pure caustic state); they are then well cleansed by thorough washing in wash-wheels, or in stocks, to ensure their being entirely divested of the alkali. The intention of thus treating them with potash, is to remove any grease or im-

purity that may be attached to them, which would otherwise endanger the evenness and uniformity of the colours. This process is called *sizing*.

By some observant calico-printers it has been imagined, that the rendering of the ley caustic is apt to impair the texture of the cloth; and we doubt not but that this has often been the case. Under the eye of the master, however, we are sure that it might be employed with advantage and safety.

It may be remarked, that in weaving calicoes the workman generally greases the reeds, in order to make them move easier. Tallow is also employed for dressing the warp, and this has a baneful effect on all goods which are designed for printing. Wherever this grease is in the cloth, it becomes fixed by the operation of singeing; and if it be not taken out before bleaching, it will not come out afterwards by the usual process of sizing and scouring; for, when the pieces are submitted to a blue vat to be dyed of a uniform self-colour, all those greasy places will be found to have taken the dye in a very imperfect manner. If the calico-manufacturers themselves would make a point of preparing the oleaginous matter for the weavers, and would furnish them with nothing but pure vegetable oils, such as those of rape, linseed, &c., it is very likely that these inconveniences would not occur; for the stain from *vegetable* is not so indelible as that from *animal* oil. To cleanse such goods, various expedients have been adopted, but we apprehend nothing but a solution of caustic alkali can be depended upon. To prove the effect of any method which may be tried, it is a good way to run the pieces through water, and then to pass them from the water so gradually over a roller, as to give the superintendent an opportunity of examining every inch of the surface; and if any part remains greasy, it will be seen at once, for that part will continue dry, while all the rest of the cloth is wet.

There is another way in which the goodness of bleaching might be proved. Let a few of the suspected pieces be run once or twice through a madder-copper, at the temperature of about 180°. This will inevitably mark any part that may be imperfectly bleached; whereas, if the operation has been properly performed, they will come out so little stained, that an intelligent workman, who has been used to a madder-copper, will at once be satisfied that they contain no impurity that can form a permanent mordant.

The next process is one with diluted sulphuric acid. A quantity of soft water having been poured into a leaden vessel, oil of vitriol is gradually added to it, in the proportion of about twenty pounds of oil of vitriol to every hundred gallons of water, which by weight is in the proportion of about one to forty.

When this mixture has been well stirred, it is ready for use. Sometimes it is employed in this state, at others it is heated to 90° or upwards of Fahrenheit, according to the nature of the work to be done, and the goods are immersed in it. They are not suffered to lie in this solution, but are wound by means of a winch over a wooden cylinder, that every part of the cloth may be immersed in the fluid, and exposed alternately to the action of the atmosphere.

This operation is generally continued for about twenty minutes, and is designed to remove any iron-moulds or other stains which the cloth may have acquired. It has also the effect of neutralizing any portion of potash that may have been left in contact with the cloth. The process is called *souring*.

After this operation it is necessary to wash the goods thoroughly, that no part of the acid may be left in them to injure their texture, and this is best effected by means of

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the wash-wheel. The calicoes are then to be regularly and thoroughly dried, which finishes these preliminary operations, known in the trade by the term *preparation*; so that those cloths which have passed through these manipulations are said to have undergone a preparation. Besides the uses already mentioned, there is another advantage attending these processes, *viz.* that the cloth which has undergone this preparation will bleach sooner, the colours will be brighter, and the whites more delicate, than they would have been had they not gone through these previous operations.

The next process is that of *calendering*. Here the goods are passed through a set of rollers, which gives them a gloss, and the appearance of their having been ironed. They are now fit for printing. For copper-plate printing, or cylinder work, the process of calendering is omitted.

In printing fast colours, the artist usually proceeds in this way: he lays the piece of calico, which has been already smoothed by calendering, upon a strong thick table, which is previously covered with a woollen cloth. He then proceeds to apply one or more mordants, as the case may require, for fixing the intended colours. These mordants are applied by means of wooden blocks, with the patterns formed upon them. These blocks were formerly chosen of holly, and the cutting them was a separate branch of the business, and was called *block-cutting*. Of late years, however, a considerable improvement has been made in this part of the business by the introduction of brass or copper; that is, the pattern, instead of being actually cut in the wood, is now formed by means of slender pieces of one of those metals being firmly fixed to the block, so as to produce the pattern intended. This alteration was occasioned by the perishable nature of wood, on account of which every printer incurred great and unnecessary expence. The pattern when thus formed with copper, is not only more lasting, but it has also the advantage of giving greater sharpness and beauty to the impression. When it was customary to use wooden blocks, the patterns were not enched in the wood, but the wood was cut away in such a manner as to leave the pattern in relief. It will be obvious that this must always be the case in *block-printing*.

When the mordant is ready, it is mixed up either with flour-paste, or with a thick aqueous solution of gum arabic, gum fenegal, or gum tragacanth, and is then spread upon a piece of superfine woollen cloth, strained tight upon a hoop. This is placed within another hoop, covered either with sheep-skin or oil-cloth. These hoops are both so broad as to give to each of them the appearance of a tambarine. That which is covered with the woollen cloth is called a *sieve*, the other a *case*. The sieve within its case is now placed in a small tub of gum-water, and is ready for use.

Flour is an article of considerable consumption with the printers for making paste. Some houses buy twenty barrels of American flour at once. Should it be musty or four from keeping, it is of little consequence for their use; but they are careful to buy none but such as has been made with found wheat, for if unfound it will be of no value for their purposes.

Gum tragacanth is much dearer than the other gums mentioned above; but notwithstanding this, it must be had for some styles of work, as no other will answer for any of those colours or mordants which are prepared with nitrous acid. A solution of gum fenegal would be coagulated in an instant by any of those preparations. Of late years, an article called British gum has also been much in use for the same purpose; so much so that the making of it has become a distinct trade. It is merely common starch pul-

verized, and then calcined till it assumes a cinnamon-brown colour.

When the apparatus is thus prepared, the mordant is applied by a brush to the surface of the sieve. This is called *teering*.

It should have been remarked, that when a colourless mordant, like the acetate of alumine, is employed, the workman generally mixes a little of the decoction of Brazil wood, or of any other fugitive dye, with it. This is called *lightening*; and is for the purpose of making the pattern more obvious to the workman, that he may see its progress, and the efficacy of the materials, as he proceeds in printing. The manipulation may be thus described.

Taking the block containing the pattern in one hand, the workman applies it gently to the surface of the sieve, so that a sufficient quantity of the thickened mordant may adhere to the figures. When the block is thus charged, he applies it to the calico, and gives it a blow with a small mallet, either slightly or otherwise, according to the nature of the pattern.

This alternate application of the block to the sieve and to the calico, is continued till the workman has gone over the whole piece. In this way, several different mordants are sometimes applied to the same piece of goods. This is indeed always necessary, when the finished piece is intended to contain a variety of colours, the different colours requiring different mordants to fix them and render them permanent.

The calico is now removed to a room called the *stove*, where a certain degree of heat is given to it by means of flues, which go round the room on the inside, near the floor. In this room, it is generally continued for at least twenty-four hours. This is when common red-liquor has alone been printed; but if citric acid or strong muriate of tin has been employed, less time is sufficient, and for the latter seldom more than half an hour is allowed. The intention of this is to evaporate the acids used in the preparation of the mordants, and which might otherwise injure the texture, and also to fix the base more surely within the fibres of the cloth.

In this operation, an attention to temperature is of the utmost importance. In general the room is kept at about 90°; but an intelligent calico-printer varies this according to the nature of the work under operation. If iron-liquor has been employed in printing the goods, it is an excellent practice to keep them for several days exposed to the atmosphere, after their removal from the stove, as the blacks, pompadours, olives, and indeed every other colour prepared with that metal, will increase in intensity; the goods will clean better in the dung-vessels, as will be explained hereafter, and the colours will rise higher and brighter when they come into the copper of bark or madder. The iron in an acetous solution is in the state of the *black oxyd*; but by exposure to the air it acquires a further dose of oxygen, and the more nearly it is made to approach to the state of the *red* or peroxyd, the more fit it becomes for a mordant in dyeing. It may be worth an experiment to discover whether the colours containing iron would not be better if they were suffered to be only a *very short time* in the stove, but were hung up instead for several days, exposed to a current of air at the temperature of the atmosphere; as the iron would thus acquire the oxygen flower, and consequently would be fixed more firmly within the cloth.

When the pieces have been properly stoved, they are passed, by means of a winch, through water at various temperatures, with a little cow-dung mixed in it. This part

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part of the business was formerly conducted in a very uncleanly and negligent way; but of late years some printers have incurred a considerable expence in the construction of their dunging machines, with cocks for hot and cold water attached to them, and thermometers to regulate the temperature. Those erected by Mr. Wright, a very ingenious calico-printer, at Strines, near Disley, are the most complete of any we have yet seen.

The intention of the dung is to absorb and remove that portion of the mordant which is not actually combined with the cloth, and which otherwise might stain the white or unprinted parts.

We suspect the dung of the cow is serviceable in another way besides that of cleaning, though the printer may not be aware of the nature of its operation. To clean calicoes by immersion in a dung-vessel, may appear to be a strange phrase; but as this is the technical language of the trade, no other could be employed with propriety. It is acknowledged that madder, cochineal, and some other dyes, produce much better colours on woollen than on cotton cloths, owing to the former being of animal, and the latter of vegetable origin. We presume, therefore, that the dung imparts an animal matter to the fibres of the cotton, and that this animal matter acts as an additional mordant, and thus more powerfully attracts the colouring particles of the dye, than the mordants alone would be capable of doing. Berthollet, who analysed the dung of the cow, found in it a substance partaking of the nature of bile.

If a piece of calico, prepared with the acetate of alumine, be divided into two parts, and the superfluous mordant removed from one of them by cow-dung and water, and from the other by water only, though both fluids were at the same temperature, it will be found, on passing the two portions through a decoction of weld or quercitron bark, that the yellow will be much more intense and bright in that which had been submitted to the action of the cow-dung. This is a satisfactory and decisive experiment.

The process of *dunging* is an operation that varies in time from five to forty minutes, according to the style of work. The pieces are then taken to the river or wheel, to be more effectually washed; after this they are passed through tepid water, in order that the workman may be assured that every impurity is removed.

His next care is to provide a copper boiler of pure cold water, in which a sufficient quantity of madder is put, and a fire lighted underneath it. The calicoes, printed and rinsed as above, are now put into this boiler, and from the time they are immersed, the workman never ceases to turn the winch, so as to pass every part of the goods repeatedly through the liquor, till the whole acquires a boiling heat. Indeed, this operation is sometimes continued for ten or fifteen minutes after the bath of madder actually boils, when the pieces are taken out and washed.

Madder is one of the most valuable drugs we have, for a variety of purposes in dyeing and calico-printing; as it is the agent by which the best and most permanent blacks are produced; also the finest purples, and every shade of red from a pale pink to a crimson. But perhaps it may not be generally known that this article improves by age. If a quantity of madder-roots be ground, and then packed tight in a cask, so as to exclude the air, and are kept thus for six months, they will then dye a much better colour, and go much further than they otherwise would have done, had these roots been used as soon as they were ground.

This process, which is called *maddering*, has the effect of imparting all the requisite colours to the goods, by means of one operation, which may be thus explained. While one

mordant precipitates the colouring matter of the madder to a red, another precipitates a different portion of it to a purple, another precipitates it to a black colour, and so of every possible shade, from a lilac to a black, and from a pink to a deep red.

If a portion of weld or bark be added to the madder, every shade from a brown to an orange may be produced; whereas, if weld or bark alone be employed, all colours between a dark olive and a bright lemon can be imparted to the cloth. These changes are all occasioned by the play of chemical affinities, and are due to the improved state of chemical knowledge.

Here it may be worth remarking, that whenever it is of consequence to produce the finest yellows or more delicate lemon colour, it is necessary to dry the pieces in the open air, as the stove would not fail to injure such colours; for stove-drying has always a tendency to convert a yellow to an orange. It is also necessary to be equally careful in the operation of dunging the mordants for these pale yellows; for, should this be done at a higher temperature than 96° or 100° , their beauty will certainly be impaired. There is another advantage in this, *viz.* by dunging at this low temperature, the dyeing may be completed even at 110° or thereabouts, which will give a much livelier colour than where a higher temperature has been employed.

The mordants generally used in calico-printing are acetate of iron for browns, blacks, lilacs, &c. and acetate of alumine for all the different shades of reds and yellows.

Formerly the acetate of iron was made by digesting old iron hoops in four beer, or in very weak vinegar; but of late years it has chiefly been made with the pyroligneous acid, [if wood be submitted to an intense heat, when inclosed in an iron vessel of any kind with a proper aperture to allow the vapour to pass, this vapour on being condensed forms the acid in question, and is now known to be a kind of impure vinegar. The wood in this case is converted into charcoal, of which a great deal is prepared by this process, particularly for the formation of gunpowder,] the oleaginous impurities of which tend, in some cases, to improve the mordant.

Blacks are also produced by the nitrate of iron [nitrate of iron was not applied to calico-printing till within the last fifty years. This discovery formed an important era in the trade, as it afforded the manufacturer the means of varying his styles of work in a multiplicity of ways and forms, which, till then, were entirely unknown,] and gallic acid; the mixture is called chemical black. This nitrate of iron is made by dissolving metallic iron in a peculiar kind of aqua-fortis. Common aqua-fortis will not answer for this purpose; for, though it may dissolve the iron with rapidity, part of the metal is apt very soon to precipitate; which not only weakens the colour, but leaves the remainder so acidulous, that there is always a danger of such a preparation injuring the texture of the cloth.

It is, however, necessary to remark, that the black which is formed by this solution of iron, is produced in a different way from blacks in general; for, when common iron-liquor is used for this purpose, it is first printed on the calico; and when it has been sufficiently oxidized by exposure to the air, the goods are boiled in a decoction of madder, which renders such parts as had been printed with the acetate of iron an intense black. But the black from nitrate of iron and galls is applied at once to the cloth, and is not afterwards raised by dyeing.

The calico-printer by using a black ready formed is thus enabled to mix it with other colours, in cases where by dyeing alone it could not be produced, as in conjunction with yellows and olives, raised by weld or quercitron bark.

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The acetate of alumine is prepared by a mixture of the sulphate of alumine with acetate of lead, both in a state of solution; so that, on the theory of double decomposition, sulphate of lead is formed, which precipitates, while the acetate of alumine remains in solution.

Since the demand for this article has been increased on account of the extension of the printing trade, it has been prepared from the pyroigneous acid by means of lime and alum. The following is the method:

The pyroigneous acid is first passed through a still, to divert it of a portion of the tar which is always dissolved in it; it is then saturated with lime or whiting; and lastly, the acetate of lime thus formed is decomposed by a heated solution of sulphate of alumine. The result of this double decomposition is sulphate of lime, which precipitates, and acetate of alumine, which is drawn from the sediment of the calcareous sulphate, and preserved for use.

And here it may be necessary to caution the manufacturer against a misfortune that may befall him if he be not conversant with the chemical nature of the substances he employs.

Magnesian lime-stone abounds in Derbyshire, and in some of the adjacent counties; and should a maker of acetate of alumine employ such lime in his process, the article which it would produce would in all probability be entirely unfit for the use of the calico-printer. But we must be more explicit.

In employing the common lime in conjunction with alum, a sulphate of lime will be formed, as mentioned above, and this being nearly an *insoluble salt*, will precipitate. But here, sulphate of magnesia would also be formed, which being a *soluble salt*, would remain in solution, and increase the specific gravity of the liquor, a circumstance which would be very apt to occasion the deception which we are anxious should be avoided. If magnesian lime-stone be employed, the liquor will appear good by the hydrometer; but, as it will contain more Epsom salt than acetate of alumine, it will be unfit for every purpose for which it was intended.

While speaking of acetate of alumine, we cannot avoid remarking that the process which has just been described for making this mordant, and which is followed invariably by many of the manufacturers in the North, is extremely improper, on account of the lime which is employed in it, be the lime ever so good, as that earth is very prejudicial to every species of red dye. The true way of making it, though more expensive, is that which was originally pointed out by Berthollet, and which consists in decomposing sulphate of alumine by means of saccharum saturni, or acetate of lead.

In reverting to the remaining processes of the print-work, it must be noticed, that when the goods have passed through the weld or madder-copper, they are usually carried to a boiler containing wheat-bran and water, in which they are winched for a considerable time, for the purpose of freeing the white grounds from the stain which they had acquired from the madder or the weld. This process always impairs, in some measure, the intensity of the colours; [branning has also the effect of giving a pink hue to all madder reds. But it is not generally known what a peculiar richness may be imparted to madder-colours, by raising them with a mixture of bran and madder; that is, by mixing a portion of bran with the madder in the first instance. Mr. Parkes tells us, that he has sometimes produced colours in this way whose brilliancy has astonished him. The operation of the bran in producing this effect will be explained hereafter;] but it is a necessary operation, as there is no other mode so convenient for removing the stain which is always given to the white

part of a print by the madder, the bark, or the weld, which has been used in dyeing it.

It frequently is the case, however, that goods will not bear to be sufficiently branned to clear the whites entirely by that one operation; [the temperature at which the operation of branning is performed, is very important. If bark yellows are dyed at 100°, it is customary to bran such goods at 115° or 120°, as it is a principle always to bran at a higher temperature than the goods are dyed at. Madder-work must be branned at a boiling heat;] such goods, therefore, are partially cleaned in the branning-copper, and are then laid on the grafs for some days, till they become perfectly clean.

But within a few years a new method has been introduced, which consists in immersing the pieces for a certain time in a very weak solution of one of the bleaching salts, such as oxymuriate of potash, soda, or magnesia. [A Scotch house of great consequence had practised this method a considerable time; and in the year 1812, a person visited Lancashire for the purpose of instructing the English printers in the method.] This simple process, which effects in a few minutes what would require more than as many days in grafs-bleaching, is now much practised, and promises very soon to supersede crofting entirely. This is a most important improvement, as some of the large printers formerly required as much land to spread out their goods upon, as would make a farm of a very considerable size.

Besides the kinds of calico-printing already mentioned, there are others which it will be proper to notice in this place. Of these, what is called *resist-work*, is now done in considerable quantities. It is conducted in the following manner:

A certain preparation of copper, mixed either with flour-paste, with gum, or with pipe-clay and gum, is printed on the calico, in any shape or of any pattern that may be desired. [The sulphate, the nitrate, the muriate, and the acetate of copper, have all been employed for preparing the resist-paste; but the sulphate is the best for the purpose; unless a very concentrated solution of the four salts were prepared by successively dissolving each of them in pure water.] When this is sufficiently dry, the goods are repeatedly dipped in the blue vat till they have acquired that depth of tint which may be required; and then, when they are washed, and passed through diluted sulphuric acid, those parts which had been printed with the preparation of copper, are found to be a good white; the preparation having effectually resisted the operation of the indigo, [the art of making an indigo-vat consists in forming such a mixture of lime and sulphate of iron as shall most effectually deoxygenize the indigo; as indigo has no affinity for cloth in its natural or oxygenized state. Hence, those parts of a piece which are printed with a solution of copper will never be dyed blue in one of these vats; because the deoxygenized indigo becomes oxygenated the moment it touches the copper, which parts with its oxygen to the indigo, and occasions it to become insoluble, and consequently incapable of forming a dye. Thus, while sulphate of iron has the power of deoxygenizing indigo, sulphate of copper, or any other salt of that metal, is incapable of retaining its oxygen, whenever it comes in contact with that singular substance in a state of deoxygenization; and it is a curious instance of the different degrees of intensity by which oxygen is held by the different metals;] though all the other parts of the cloth have received a permanent dye. The various deep blue calicoes with white spots or white figures, which are now so common, are generally done in this way; and by a similar management with subsequent dyeing in madder, weld, or bark,

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bark, figures in red or yellow are exhibited upon a blue ground.

In some particular styles of work, the operation of certain colours is refitted by means of stopping out with wax; but this is too expensive a method to be adopted often in these times, when it is the object of every manufacturer to finish his prints at the least possible expence. [In printing those silk handkerchiefs called Bandanas, a process called waxing is still followed. It consists in making a preparation of tallow and rosin very liquid by heat, and in printing it in that state with a block upon the silk. When such goods are passed through the blue vat, those parts which are covered with the tallow and rosin are preserved from the action of the indigo, and remain white, while all the rest is dyed a fast blue. The method afterwards taken to discharge a part of this blue, and produce yellow, orange, &c. will be mentioned hereafter.] Formerly this mode was very generally practised, and wax [in the East Indies wax is still used for preserving the whites in calico-printing] was consumed in very large quantities by this process. [A very singular-looking substance was discovered a few years ago near Stockport, which being handed about from one to another as an undefinable substance, created considerable interest in that neighbourhood. Every body supposing it to be a natural production, specimens of it were sent to a variety of persons into various parts of the kingdom, for their opinion and analysis, and among others a portion was sent to Mr. Parkes. However, after every one had been busily engaged in examination and conjecture respecting this unknown substance, it was announced, that some seventy or eighty years before a calico-work had stood on the spot where the article was found, and that this was nothing more than a large heap of of the refuse compound of flour, wax, and gum, above-mentioned.]

The reader will perceive that these *refits* are employed for the purpose of preserving certain parts of a piece white, and of giving other varieties to those grounds in which blue is the predominant colour: but if the ground is to be white, and the piece is only to have one small object [a technical term, belonging to this branch of manufacture] in indigo blue, such as a single sprig, then a different management is necessary, and the colour is imparted by a process which is called *pencil-blue*.

Here the indigo is deoxygenized by means of orpiment, which is a sulphuret of arsenic; and formerly, whatever objects were done with it were put in by means of a pencil: hence its name, *pencil-blue*. [Pencil-blue is composed of the following ingredients, *viz.* Ten ounces of indigo finely ground in water; twenty ounces of quick-lime in lumps; the same quantity of potash of commerce, or the impure sub-carbonate of this alkali; and ten ounces of orpiment. These proportions require one gallon of water, and the whole is to be thickened with gum fenegal.] See COLOUR.

Another kind of process remains to be noticed, called chemical discharge-work. Here the cloth is first dyed of some uniform colour, by means of a mixture of iron-liquor, and some one or more of the common vegetable dyeing substances; and calicoes thus prepared are said to be dyed of self-colours. They are then washed and dried; and when properly pressed or calendered, they are fit for receiving any pattern whatever, according to the artist's taste or design.

This is generally effected by means of the mineral acids, which are previously composed for the purpose, by dissolving in them a portion of one or more of the metals, according to the nature of the dye which is intended to be discharged, or of the colour to be produced. In doing this, care is taken that the discharging liquor be made so as to be capable of

dissolving the iron which is contained in the dye, and which is always used in such quantity as to cover, or at least to disguise in a great measure, the other colour or colours which had been employed with it, and at the same time to act as a mordant in beautifying and fixing those colours.

Thus a piece treated with a decoction of Brazil-wood, and dyed black by being padded [by the term *padding* is understood the operation of passing the pieces from a roller through a trough containing a solution of iron, or any other mordant. *Bleaching* is another term used in calico-printing, and is synonymous with padding] with iron-liquor, if, when dried, it be printed with a peculiar solution of tin, the ferruginous portion of the dye will be dissolved, and the printed part will instantly be converted from a deep black to a brilliant crimson.

In the same way an olive-coloured calico, dyed in a solution of iron and a decoction of weld, will as quickly be changed to a bright pale yellow; and the various drabs and flates of every shade which have iron in their composition, will undergo as sudden a change by the same treatment; though the colour of the figures produced on them will depend on the materials with which the cloths were originally dyed. Even the deepest gold colours, or strongest buffs, if produced by iron only, may, by a peculiar preparation of tin, be discharged; and such parts of the cloth as have been treated with this metallic solution will be restored to their pristine whiteness.

By similar management, calicoes dyed of a light blue in the indigo-vat, then run through sumach and copperas, and finished in a bath of quercitron bark and alum, may have figures of a bright green imparted to them. Here the green is originally formed by means of the indigo-vat and the bark, though it is enveloped by the iron of the copperas, which overcomes the other colours, till the solution of tin is applied, which removes the iron from those particular parts, and gives a brilliancy to the remaining colours which they would not otherwise have possessed; the tin being a powerful mordant for the bark, by which the yellow of the green is produced.

Again, a good self-colour may be given to calicoes, merely by dyeing them in sumach and copperas, and then running them through an alkaline solution of annatto; and here the figures produced by the application of a colourless solution of tin will be of a bright orange. But it is needless to enumerate more instances, as the workman accustomed to a dye-house will have little difficulty in varying these in a thousand ways, when he becomes acquainted with the nature of the solution of tin which he employs.

The whole of this, however, refers to that branch of discharge-work only, where all the purposes are attained by dissolving the iron which makes a part of the colour that is intended to be discharged; whereas, the finer and more expensive work is done in a different way, and by a process which it will be necessary for us presently to describe.

In the mean time it may be proper to remark, that there is an objection to the particular kind of chemical discharge-work of which we have been speaking, namely, that it is not perfectly fast; that is, the goods produced in this way will not bear such frequent washing, as those which are done by the bath of madder or bark.

It is certainly an object of great national importance to give a permanency to the calico-printing of the country; [to this end great improvements have lately been made in the method of grinding madder-roots, by separating the inferior parts, and dividing the whole into two or three different qualities. Thus the printer is enabled to apply the finest, which in this way is made equal to Dutch crop-madder,

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madder, to his best work, and the other is laid by for inferior purposes;] and a great deal of very excellent printing is now done in various parts of the kingdom, especially the best chintz-work and other furniture patterns. But, in what is called fast-work, there is a great variety of qualities, and some of it little deserves the name of permanent.

The mention of permanent colours reminds us of a very valuable green which was invented a few years ago by a Mr. Illet of London, and which deserves to be noticed by us. This colour, which was secured to him by his majesty's letters patent, was produced by printing ground indigo, mixed with a peculiar kind of solution of tin, and in then fastening the indigo within the fibres of the calico by means of that process, which is well known to printers by the technical designation of *china-blue dipping*. [China-blue is produced thus: Indigo ground fine, and then thickened, is printed upon the cloth, and afterwards it is dissolved, and chemically united to the fabric, by alternate immersion in a solution of sulphate of iron and in lime-water. A description of this process has already been given very much in detail, in our eleventh volume, part ii. under the article *DIPPING, in Calico-Printing.*] After this the goods are to be dyed in a copper of bark or weld, which converts the blue to a green, and the whites are to be cleaned by croft-bleaching, &c.

Upon this very ingenious process, Mr. Parkes has the following observation. "Having," says he, "formed a very high opinion of this invention, I procured several interviews with Mr. Illet, soon after he obtained the patent, and from him was fully informed of the whole process.—This I have since repeated for the purpose of verifying the detail in all its branches; and I am satisfied that it is one of the most beautiful and permanent colours that has ever been fixed upon cotton."

There is, however, another mode of producing very beautiful blues which has been much practised lately, and therefore deserves notice. This consists in printing some solution of iron, and then passing the goods through a very dilute and neutral solution of prussiate of potash. The prussian blue which is thus formed upon the cloth may be rendered tolerably permanent by a variety of expedients, and this by means of any of the yellow dyes may afterwards be formed to any shade of green or of olive.

In returning from these digressions we must not forget to revert to that other kind of discharge-work which we have engaged to describe, and which we will now attempt as concisely as is consistent with perspicuity and correctness.

Here, the agent which is employed is the citric acid, and this is used in various states of concentration according to the purpose to which it is to be applied, and the strength of the ground intended to be discharged. It is chiefly employed for the production of white figures upon self-coloured grounds produced by madder and fundry other dyes. For this intention the acid, in whatever state of concentration it may be, is mixed with either gum or with paste, [when citric acid is used for resist-work, it is always mixed with gum fenegal and pipe-clay. The clay gives it a greater body, and likewise acts mechanically as a resister,] to a proper consistency for the block, the plate, or the cylinder, and from thence it is transferred to the piece; and wherever it attaches, the mordant, whether iron or alumine, is discharged, and a delicate white arises in its stead. [It should be understood, that the discharge is printed upon the mordants before the goods are dyed. In using citric acid for this purpose, a portion of one of the mineral acids is sometimes mixed with it.]

The acid here referred to is produced from the juice of

limes or lemons, and formerly it was not employed by the calico-printer until it was reduced to the utmost point of concentration, and appeared in a crystalline form. Even then, it was not thought sufficiently pure, but was dissolved again, and redissolved and recrystallized, till it became as white and pellucid as any other pure falt in a crystallized state, and was then generally sold for 36s. the pound, at which high price it could only be employed on the best styles of work. Now, however, it is oftener used in the brown, or first state of crystallization; and some of the larger printers purchase lime juice, and concentrate it themselves; and in many cases, they use it largely both for discharge and resist work, without ever crystallizing it at all. More on this subject may be seen in Mr. Parkes's Essay on Citric Acid, in vol. iii. of the Chemical Essay, page 1—118.

This mention of discharge-work by citric acid, [Mr. Thomson, who has a print-work near Clitheroe, has taken out a patent for discharging the Turkey-red dye by means of the citric and oxymuriatic acids; and the work executed in this way has a very pleasing effect,] reminds us of another species of discharge, which is employed by the printers of Bandana handkerchiefs, and which we are under the promise of noticing before we conclude this memoir.

The agent which these printers employ is the nitrous, and sometimes the nitro-muriatic acid. It is used for the purpose of putting yellow figures upon blue silk handkerchiefs. The following is the process which is principally adopted.

Aqua-fortis, or nitro-muriatic acid, of such a strength as is suitable for the kind of blue which is intended to be discharged, is mixed either with gum tragacanth, or with flour paste, to a proper consistence, and in this form it is printed on the silk, by means of a common block, on which the intended pattern is cut. The consequence of this is, that wherever the acid attaches, there the original colour is discharged, and a yellow dye is produced in its place. The pieces are then steamed, by passing them over a vessel containing boiling water, which gives brilliancy to the colour and finishes the operation.

If a stronger dye than the usual yellow, or even a deep orange be desired, all that is necessary is to immerse the goods, for a moment, in lime-water, or in a solution of lime and potash; and by varying the proportions of these ingredients a great variety of shades may be produced.

Recollecting, however, that this is a paper professedly on calico-printing, we must not deviate too far from the path we have prescribed; or otherwise, there are many processes in the printing of silks which are curious and interesting, on which we might copiously expatiate. The Bandana handkerchiefs which are printed upon cotton in imitation of India goods, are produced by a very different process, and which we have already described under the article *DISCHARGING of Colour*, in vol. xi. part ii.

Having been speaking of yellows, it may be worth mentioning, that there is a mode of producing yellows on calico which is not very frequently practised, and yet has a very good effect. The process is as follows:

A strong decoction of bark, thickened with gum tragacanth, is to be mixed with a portion of very pure muriate of tin, and this, when printed with the usual management, will produce a colour of great brightness and durability. We mention this the rather, because very many pleasing effects may be obtained by this method which cannot be produced in the usual way, by means of the acetate of alumine, and any of the yellow dyes that may be employed with it.

There is one very important advantage which this mode possesses,

possesses, viz. that should it be necessary to pad a piece in diluted acetate of alumine to obtain a pale lemon ground, the yellow figures, previously done by the above process, will not give out any part of their colour to the second mordant; whereas, whenever a strong yellow has been produced in the common way, the pattern is very apt to spread and become irregular, and oftentimes to stain the ground, when the piece comes a second time into the acetate of alumine.

Observing that the treatise from which we have made such copious extracts, contains no particular directions for the preparation of that superior kind of calico-printing called chintz-work, we applied to Mr. Parkes upon the subject, and he has furnished us with an original communication to supply that deficiency, which is as follows:

The term chintz-work is descriptive of that kind of calico-printing which is employed for beds, window-curtains, and other furniture, and it differs more in the richness and variety of the colours, than in any other circumstance.

In relating the processes by which these beautiful prints are produced, we shall suppose the calico to be already properly bleached and calendered, ready to receive the impressions of the block. The first thing then to attend to is, to apply the mordant for the colour which is intended to be imparted in the first instance. Thus if a black be designed, a mordant of acetate of iron, commonly called iron liquor, is thickened with gum, and printed upon the cloth in any pattern that may have been selected for the purpose. If this same mordant be diluted with water, it will form a proper mordant for a purple; and the same, still further diluted, will, when it comes into the dyeing copper, form a lilac. In this way, all the varieties of shades, from a pale lilac to a strong purple, and from purple to a black, may be produced by acetate of iron diluted with various proportions of water, and then dyed with madder.

In like manner, a colourless solution of acetate of alumine thickened with gum or flour paste, forms a mordant for dark red; if diluted with water it makes a common red; and by diluting it further and further every shade of pink may be produced. Again, by the admixture of acetate of iron, and acetate of alumine, a mordant for chocolate colours, maroons, &c. is formed, either approaching to the purple or the red, according to the admixture; that is, according to the proportion of either of these original mordants which may predominate in the mixture.

When these several mordants have been printed upon the calico, they are allowed to dry for two days or more in a stove or drying-house; they then go through the operation of dunging, which consists in rinsing them in warm water, in which a little cow-dung is diffused, as has been already described. When the pieces are sufficiently dunged, which is not the case till all the superabundant mordants are removed, they are well-washed in clean water, and then boiled in a decoction of madder, until the madder-bath is exhausted. In consequence of different mordants having been applied to the cloth, this one boiling in the madder-liquor will at once produce all the colours above-mentioned. When the pieces are thus dyed, they are to be rinsed in cold water, and laid upon the grafs to bleach. By this exposure to the air for a few days, the whole of the ground to which none of the mordants had been applied, will become perfectly white.

The processes which have now been detailed, will produce what is called common chintz-work; but if it be desired to make the goods still richer, by the addition of yellows, bright olives, drabs, &c. the cloth must undergo another series of operations, which may thus be described.

Upon those parts of the calico which still remain white, any of the above mordants may be printed, according to the effect designed to be produced, after which all the preceding managements are to be repeated, except that instead of boiling in a decoction of madder, they are to be immersed for about half an hour, more or less, in a warm decoction of quercitron bark, the *Quercus nigra* of Linnæus; a most important dye-word, introduced by Dr. Bancroft, and which is found to give out a much brighter colour to tepid water, than it does when treated with boiling water, or with water nearly approaching to that temperature.

The effect produced upon these prints by an immersion in a lukewarm decoction of this American bark, will be quite different from that produced by the madder; upon those parts of the cloth where the mordants have been printed which before produced a black, a dark olive only will be apparent, and instead of pompadours will be drabs, and instead of reds we shall have yellows, which will vary in intensity according to the strength of the aluminous mordant.

Again, a further variety may be given to these prints, if the yellow mordant, or acetate of alumine, be applied to any of the colours which have already been dyed with madder; but this must be done before the pieces are immersed in the decoction of bark. This application will convert the reds and pinks into different shades of oranges, and the lilacs into cinnamon colours. By means of these different processes an endless variety may be given to the goods, and a calico-printer of taste will never be at a loss how to produce a pleasing effect, whatever may be the patterns which he has to imprint upon the cloth. This second immersion in the dyeing vessel will, however, give a yellow tinge to the remainder of the whites, but a short exposure on the grafs will obliterate it.

When chintz furniture-prints are designed to have as much variety of colouring as possible, a part of the remaining white is often coloured blue or green, or of any shade between those colours, by a still different process. This is done with what is called pencil-blue, which is a preparation that has already been described. The blue is given by putting in the prepared indigo with a pencil; and the green is produced by pencilling some of the same colour over certain parts of the pattern which has already been dyed yellow. When these colours have been imparted, the printing is said to be finished, and the pieces are hung up to dry for at least twenty-four hours, after which they are rinsed thoroughly in cold water; and when they have been dried with care, they are properly calendered and put up for sale.

Nothing now remains but to notice an improvement which has been made of late years by the introduction of cylinder-printing, and which has the advantage of superior accuracy and neatness, as well as of great expedition.

The machines which effect this are rather complicated and expensive; but they are so contrived that the cylinders on which the patterns are engraved, furnish themselves with colour during their revolutions; are kept clean by a steel knife, or *doctor* as it is called, passing over their surfaces the moment they have charged themselves with the thickened colour; and they have such a pressure given to them, either by means of screws or levers, which can be tightened or slackened at pleasure, that the whole surface can be made to deposit its colouring matter with the greatest certainty and exactness on the cloth, while this rolls over it in succession, from one end of the piece to the other.

These cylinders, which are made of copper, are from eighteen to forty-two inches in length, according to the width of the calico to be printed, and three and a half to

five inches in diameter; and these maffy rollers have the patterns enched upon their surfaces, in the same way as a pattern is cut upon a flat plate of copper, that is intended to be employed in copper-plate printing. As these cylinders are made with plates of copper hammered into a circular form and joined by brazing, great loss has sometimes been sustained by the engraving giving way upon the brazed joint. To obviate this, a patent has been lately obtained for boring the copper cylinder from the solid metal in the modern way of boring cannon.

Many of these machines are now contrived so as to carry two of these cylinders, each of which has a trough of colour attached to it, by which means two different colours may be printed on the same calico, at one and the same time.

Mr. Adam Parkinson of Manchester has lately invented a machine capable of printing at one time, by means of one cylinder and two surface-rollers, or by two of the former and one of the latter, three distinct colours.

These machines have not only the excellence of printing more correctly than can possibly be done by means of the block, but the saving of time and labour which they afford is great indeed. A piece of calico which would take a man and a boy three hours to print with one colour, or six hours to finish with two colours, may by this means be done in three minutes, or three minutes and a half, and then much more completely than could even have been imagined before the introduction of this invention.

Besides these cylinders there are others which are called *surface-machines*, which contain cylinders of wood, and which have the pattern formed upon their surfaces in relief, exactly similar to the blocks already described. These are employed in particular styles of work, especially in light ground-work, and for certain kinds of resist and discharge work.

In light work, the white grounds are apt to be soiled by the cylinders: hence surface-machines were contrived, and these are not liable to the same objection. Cylinder-machines are more commonly employed in those styles which are full of colour and leave but little white.

It must be obvious to every one who is acquainted with the subject, what an astonishing facility these machines have afforded to the production of printed calicoes; and also what an advantage they give to the British printer in foreign markets.

But we cannot conclude without expressing our fears, that even these facilities may eventually be the means of doing a serious injury to the trade, and of destroying that confidence in the goodness of British prints, which has hitherto been generally felt in every market on the continent, and also in every part of the New World, wherever they have been introduced. We refer to that mode of printing which has lately been adopted, and which consists in precipitating the colouring matter from logwood, and from other *fugitive* dyes, and in printing these on the cloth, without any mordant or previous preparation whatsoever. Thousands of pieces of this sort have been finished at the low rate of one penny the yard, including every expence of colour, paste, and printing. These articles, it will scarcely be credited, are dried up immediately from the printing-machines, and are shipped abroad, without even being washed off.

To *wash off* is a technical phrase. It means the soaking and rinsing the pieces in water, in order to dissolve and remove whatever gum or paste had been employed with the colours in printing them.

Such goods, wherever they go, must produce great dis-

satisfaction; for they will neither endure the rays of the sun nor moisture. The first shower of rain to which they may be exposed, will not fail to wash out the pattern, and reduce them to a worse state than that of plain white calicoes.

In the reign of queen Elizabeth, an act was passed to restrain the use of logwood in dyeing, on account of the fugitive nature of its colour; and if this degrading kind of printing be continued, the interference of the legislature will again become necessary, or the foreign trade will, from this cause alone, be entirely lost to the country.

PRINTING, *Cylinder*. See the preceding article.

PRINTING on *Porcelain*. The art of printing, particularly as it applies to books, has, from its incalculable benefits and vast importance, excited at once the profound admiration and gratitude of the world; and this inestimable discovery has been claimed by several individuals, alike anxious for the honour of giving to mankind at large the advantage of a rapid and economical diffusion of delight and instruction. The *first* idea of *types* was very probably given by the *Roman potters*, who were in the habit of stamping their names in *raised* characters on their vases, &c. The letters on this plan were, in fact, *models* of the types used by the first printers; and it appears singular that the idea of adapting such models by the medium of ink, to the common purpose of multiplying words and sentences, should not have come into use until about the year 1442.

It will appear, on consideration, still more singular, that after the introduction of engraving on wood and copper, (which was in use at the same time with letter-press printing,) the art of transferring impressions of ornamental designs, from the copper-plate to the surface of porcelain or pottery, was not discovered till about the year 1760.

The Royal Porcelain Works in Worcester, belonging to Messrs. Flight, Barr, and Barr, are the only establishment that claims the honour of inventing this admirable and ingenious process. We can find no mention of this art in the annals of this or any other country prior to this period. It was practised with great success for many years in the works alluded to; and besides the demand for home consumption, large quantities were exported to Holland. In the year 1788, his present majesty Geo. III., and his royal consort the queen, with the princefs royal, the princefs Augusta, and the princefs Elizabeth, visited the Worcester Porcelain Works, and particularly noticed this ingenious branch of the art of decoration. The royal party were much gratified by the compliment paid them, in the striking off impressions from two copper-plates with the likenesses of the king and queen, which had previously been engraved by direction of the proprietors, in order to exemplify the nature of the operation. The secret of the printing was, about the year 1781, conveyed from the works at Worcester into the potteries of Staffordshire, and has proved of infinite service in extending this branch of national commerce, and affording employment to the numerous population in that part of the country. The common British blue and white printed earthen-ware is now held in high esteem in foreign countries, from its cleanly and neat appearance, besides its being in general use at home. This art is certainly best confined, as in the present day, to the inferior fabrics, such as earthen-ware, as the material on which the print is made is reasonable, and can be rendered at a price which suits the convenience of the consumer for all common purposes. The method, as invented and adopted by the original proprietors of the Worcester Porcelain Works, is as follows:—The engraved copper-plate having
first

first been warmed on the stove, is prepared to receive the colour, which, being previously mixed with oils of a proper consistency, is then rubbed into the engraved lines, and the superfluous quantity of colour is carefully cleaned from the surface of the plate. The paper, which is very thin, and manufactured for the purpose, is then laid on the plate, and delivered to the pressman, who places it on a plank covered with warm flannels, and being fixed between two iron cylinders, it is drawn through by turning a wheel, exactly on the plan practised in taking off copper-plate prints. The paper bearing the clear-coloured impression is now removed from the copper-plate and delivered to the printer, who fixes the piece of porcelain in a vice, to keep it steady; and the printed paper is then rubbed with a wooden tool, covered with flannel, till the impression is completely transferred to the surface of the biscuit, or unglazed porcelain. The operation of rubbing on the impression being completed, the porcelain, with the paper left on the surface, is thrown into a tub of cold water, and in a short time the paper delivers itself, and leaves the print. The ware is now placed out to dry, and is afterwards carried to the kiln, where the impressions are burnt in. It is then dipped in the liquid vitreous substance called the glaze, is burnt a second time, and the colour, which is the oxyd of cobalt, (and most generally used,) comes out a neat blue, perfectly secured under the glaze.

An improved method of printing, comparatively of very recent invention, was introduced under the direction of the late Martin Barr, esq., and is now carried on in the Porcelain Works at Worcester, and is much admired for the excellence of the engravings, and the great beauty of the impressions. On this plan, the printing-press and stove are not necessary, as the engraved plate is charged with a prepared oil by the printer, who cleans the surface of the engraving with the hand; and instead of paper, a *bat of glutinous consistency* is cut out and laid on the copper-plate, and is so ductile as to adapt itself to the form of any vessel intended to be printed; and by the simple pressure of a stuffed leathern ball *with the hand*, produces a perfect impression of the subject *in oil* on the smooth side of the bat. The ware being rubbed dry and clean, the bat is now gently pressed with the leathern ball on the *glazed surface* of the porcelain, and when removed the impression appears complete, *but only in oil*. The colour, in form of a powder, is then lightly moved over the oil impression with a piece of carded cotton, and the print completely cleared of all that is superfluous. The porcelain is afterwards carried to the enamellers, who finish the design by adding some decorations in gold; and it is then passed through the enamelling kiln, where the oil is evaporated by the fire, and the colour, which is always a mineral preparation, unites firmly with the glaze, and becomes perfectly durable as the tints laid on with the camel's-hair pencils by the painters. The great advantage of this plan is, that the engraving can be executed *much finer* for the smooth surface of the *glazed porcelain*, than for the coarser blue and white prints, (which are laid on the *rough unglazed surface*), as the glaze is capable of receiving the *finest touch* the artist can put into his engraved plate. Messrs. Flight, Barr, and Barr, the proprietors of these works, have in consequence introduced beautiful engravings of figures from the antique, besides designs in landscapes, flowers, shells, &c. which reflect no small degree of credit on this branch of the art of printing. Considerable quantities have been exported to the East and West Indies; and where economy is the object of the consumer, this style of decoration suits very

well, however deficient in richness of effect and elegance, to the more elaborate production of enamelled designs, executed in these interesting and highly-respectable works.

PROFLUVIUM, l. 2, for *venenis r. ventris*.

PROJECTION of the Sphere, Orthographic. PROB. I. l. 8, for IC and FG, r. IC.

PROMEROPS, in Ornithology, a genus of birds of the order Pica; the characters of which are, habit as in the genus Upupa; feet formed for walking; tail lengthened, and in most species cuneated. Dr. Shaw enumerates and describes the following species; viz. *Ceruleus*, or blue P. with black bill and legs; the Upupa indica, or blue promerops of Latham; a native of India: *Caser*, or brown P. whitish beneath, with rufescent breast, and very long tail; the Upupa P. or Caser P. of Latham, and the Upupa P. or Merops cafer of Linnæus; a native of Africa, and common about the Cape of Good Hope: *Striatus*, or brown P. beneath white, with black undulations and very long tail; Upupa papuensis, or New Guinea brown P. of Latham; native of New Guinea, inhabiting large woods: *Superbus*, or black P. with violet and green glofs, foliated golden shining scapular feathers, and very long tail; the Upupa superba and great P. of Latham; a magnificent species, exceeding all the rest in the splendour and elegance of its plumage; a native of New Guinea: *Paradisus*, or chefnut P., the Upupa paradisæa of Linnæus and Latham, and crested P. of the latter: *Mexicanus*, or grey P. with green and purple glofs, blueish wings, yellowish belly, and very long tail; Upupa mexicana, or Mexican P. of Latham; a native of Mexico, frequenting mountainous regions, and feeding on various kinds of insects: *Aurantius*, or orange-coloured P., with tail of moderate length and even at the top; the Upupa aurantia, or orange P. of Latham; native of Guiana, frequenting the small islands in the mouth of the river Berbice; Fernandez describes the supposed female of this species under the name of *Cochitotol*: *Erythrorhynchus*, or black P. with green and purple glofs, red bill and legs, and long tail with the feathers spotted with white near the tip; the Upupa erythrorhynchus, or red-billed P. of Latham; an highly elegant species, an inhabitant of Africa.

PROPERTY, LITERARY. (See LITERARY Property.)

The state of literary property has been considerably improved since the article on this subject appeared in the body of this work. By the act of 54 Geo. III. c. 156. an absolute term of twenty-eight years copyright has been vested in the author of every book that shall be published after the passing of that act, and in his assigns, and if the author shall survive that period, the copyright is also secured to him for his life. On books that were published before this statute was made, the second contingent term of fourteen years granted by the former acts on this subject, was made absolute in such authors as were then alive, and a life interest was also added if they survived this extension. On this last subject, the court of King's Bench has decided in a recent case, that if the book had become the property of the public at the time the act passed, which was on the 29th July 1814, the benefit granted by the act to the authors of books published before that time, were not meant by the legislature to apply in such instances.

The same act continued the obligation of delivering eleven copies of every book, and of its maps, plates, &c. to the eleven libraries therein mentioned, being the British Museum, Sion College, the Bodleian Library at Oxford, the Public Library at Cambridge, the Library of the Faculty of Advocates at Edinburgh, the Libraries of the four universities of Scotland, Trinity College Library, and the King's Inns

Library at Dublin. This delivery has been felt to be a severe burthen, and several petitions have been presented to parliament by authors as well as publishers of books to be relieved from it. These petitions were in the sessions of 1818 referred to a committee of the House of Commons, which examined many witnesses on the subject, and made a report to the House of the following import:

That it is the opinion of this committee, that it is desirable that so much of the copyright act as requires the gratuitous delivery of eleven copies should be repealed, except in so far as relates to the British Museum, and that it is desirable that a fixed allowance should be granted in lieu thereof, to such of the other public libraries as may be thought expedient.

That if it should not be thought expedient by the House to comply with the above recommendation, it is desirable that the number of libraries entitled to claim such delivery, should be restricted to the British Museum, and the libraries of Oxford, Cambridge, Edinburgh, and Dublin universities.

That all books of prints, wherein the letter-press shall not exceed a certain very small proportion to each plate, shall be exempted from delivery except to the Museum, with an exception of all books of mathematics.

That all books in respect of which claim to copyright shall be expressly and effectually abandoned, be also exempted.

That the obligation imposed on printers to retain one copy of each work printed by them shall cease, and the copy of the Museum be made evidence in lieu of it.

PROPHECY, col. 3, l. 26, for Wollston *r.* Woolston. Col. 5, l. 10 from bottom, for Woolston *r.* Woolston.

PROPOLIS, l. 33, add—See **WAX**.

PROPORTIONAL COMPASS, l. 2, *r.* proportional. Col. 2, l. 8, *r.* *fig.* 1. Plate I. of *Proportional Compasses*. Col. 5, l. 10 from bottom, insert *fig.* 10. Col. 1, l. 30, *r.* *fig.* 11.

PROVERB, col. 1, l. 17 from bottom, for print *r.* fruit.

PROVIDENCE, **NETHER**, l. 1, *r.* Delaware for Luzerne. Col. 2, l. 2, *r.* Delaware.

PRUSSIC ACID, in *Chemistry*. See **CYANOGEN**.

PUFF-BALL, l. 2, add—and **TULOSTOMA**.

PULASKI, for **PULASNI**, l. 2, add—of whom 528 were slaves in 1810.

PULTNEY, a township of Belmont county, in Ohio, having 645 inhabitants.

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PURANA, col. 3, l. 6, for Varishta *r.* Vashista.

PURPURIC ACID, in *Chemistry*. The name of an acid principle recently discovered by Dr. Prout; produced by the action of nitric acid upon the lithic or uric acid. The beautiful purple substance produced by the action of the nitric acid and heat upon lithic acid, has been long known to chemists. This purple substance is a compound of the acid in question and of ammonia. This acid, which may be

likewise formed from the lithic acid by chlorine and iodine, possesses the remarkable property of forming beautiful purple compounds with the alkalies and alkaline earths. Hence the name of *purpuric acid* has been adopted by Dr. Prout, which was suggested by Dr. Wollaston.

Purpuric acid may be separated from the *purpurate of ammonia* above-mentioned, by the sulphuric or muriatic acids. It usually exists in the form of a light yellow or cream-coloured powder. It is exceedingly insoluble in water, and consequently possesses no taste, nor affects litmus paper, though it readily decomposes the alkaline carbonates by the assistance of heat. It is soluble in the strong mineral acids and in alkaline solutions, but not in dilute acids in general. It is insoluble in alcohol. When exposed to the air it assumes a purple colour, probably by attracting ammonia. Submitted to heat it is decomposed, and yields carbonate of ammonia, prussic acid, and a little fluid of an oily appearance.

The alkaline *purpurates*, as before observed, all form solutions of a beautiful purple colour. They are capable of crystallizing, and their crystals possess some remarkable properties. The *purpurate of ammonia* crystallizes in quadrangular prisms, which when viewed by transmitted light appear of a deep garnet-red, but by reflected light two of the opposite surfaces appear of a beautiful green, while the other two retain their natural red colour. This curious property seems to be possessed by the other alkaline *purpurates*. The metallic *purpurates* are in general remarkable for their solubility, and the beauty of their colours. The *purpurate of zinc* is of a beautiful gold-yellow, the *purpurate of tin* of a pearly-white. The other *purpurates* are all more or less of a red colour.

Dr. Prout thinks it probable, that this acid forms the basis of many animal and vegetable colours. The pink colour of the sediment in the urine of fever seems to be owing to the *purpurate of ammonia*. Dr. Prout also thinks, that some of its salts might be used as paints, and also for dyeing, as they appear to possess strong affinities, especially for animal substances. See *Philosophical Transactions* for 1818.

PURSHIA, in *Botany*, so called in just commemoration of Mr. Frederick Pursh, author of the rich *Flora Americae Septentrionalis*.—De Cand. Tr. of Linn. Soc. v. 12. 157.—Class and order, *Icosandria Monogynia*. Nat. Ord. *Senecioæ*, Linn. *Rosaceæ*, Juss.

Ess. Ch. Calyx five-cleft. Petals five. Capsule superior, oblong, of one cell, bursting at one side. Seed solitary, erect.

1. *P. tridentata*. Downy Purshia. De Cand. (Tigarea tridentata; Pursh 333. t. 15.)—In the meadows of the Rocky-mountains, and on the Columbia river, flowering in July. A much branched *strub*, with wedge-shaped, crowded leaves, three-lobed at the extremity, and solitary, terminal, yellow flowers, nearly the size of Hawthorn.

PYMATUNING, l. 3, *r.* 379.

PYRAMID, col. 2, l. 36, *dele* and character and feet.

PYROACETIC SPIRIT, in *Chemistry*. See **ACETIC Acid**.

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QUADRUPEDS, col. 6, l. 33 from bottom, add—
See also *NATURAL History*.

QUARANTINE, that space of time (usually forty days, as the term manifestly implies) which vessels and persons are restricted from having intercourse with other vessels or persons, or with the shore, on their arrival from places subject to the plague or other infectious disease or distemper, or having held communication with ships coming from such places, or on board of which any infectious disease shall have appeared during the voyage.

The public health is a matter of the highest importance, and whoever is sensible of the havoc which the plague and other infectious diseases formerly made in this country, (see *PLAGUE*), and considers the prevalence of such diseases in some parts of the globe, how easily they are communicated, and how long the poisonous contagion lies dormant without losing its malignity, will readily assent to the strong necessity that exists for rigorous precautions being adopted, to prevent its introduction into these kingdoms.

Of such common concern, indeed, is the health of large and trading communities, that the chief magistrates (says Blackstone) have the guardianship of the public health, and are empowered to issue such ordinances as may be deemed necessary, either to prevent the introduction of infection from neighbouring or remote countries, or for separating those actually infected by removal, or by cutting off communication with their abode.

In this country, a Board of Health has been instituted, to inquire into the nature of the infection of the plague, and the best mode to counteract its effects; and public ordinances have been made from time to time upon this subject; formerly by proclamation, but latterly by parliament. And such has been the anxious solicitude to frame the laws and orders to obtain the ends desired, that they have at various times undergone laborious revision, and such further regulations and amendments have been introduced as by experience were found to be necessary. Nor has the care and anxiety of the British government stopped here, for their consuls and public functionaries abroad are instructed to convey, with the utmost promptness, intelligence of the appearance of any epidemic distemper in the places where they reside, or in such as are in their vicinity. Government is thereby enabled to issue necessary directions, for subjecting ships and persons arriving from thence, to a more rigid examination and seclusion than might otherwise have been adopted. Governors and commanders have similar local powers and instructions, and are empowered to make such orders, either to regulate or entirely cut off communication with suspected places and vessels as they shall deem necessary. In sea-ports, vessels and their cargoes and crews are subjected, on arrival, to examination; where the two

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former are aired and purified for a necessary time, and the latter retained a certain number of days, in which time, it is supposed, any infectious disease they might retain, would make its appearance.

In inland places, restraints are likewise imposed for similar purposes, and intercourse thereby cut off by proper means, (usually a cordon of troops drawn round the infected place,) which taking possession of the roads, rivers, and watercourses, effectually prevents infected persons entering the place, as well as others from escaping.

All these measures, though they may appear arbitrary, are founded upon sound policy; and however irksome they may be found by those who are subjected to their operation, yet if they reflect for a moment what dread is created at the very apprehension of approaching persons afflicted with diseases of an infectious or putrid nature, or having even the possibility of harbouring contagion; and what dreadful and painful consequences are known to follow from an unguarded or indifferently exposure, in such cases they will refrain from hastily rushing into society, without submitting to such salutary precautions which are so absolutely necessary, or at least so satisfactory to their fellow-citizens. No doubt the time is tedious, and the places appointed may be but little calculated to afford comfort to or reconcile "*les detenus*;" but when they reflect that thousands may be swept away in a few days, by the introduction of such a malady, it is hoped they will submit with less impatience. One thing which makes the necessity less apparent is, that from the length of time since England has been afflicted with such a calamity, and from the success of the measures that have long been adopted to prevent its introduction, persons in general have no actual knowledge, and still less fear of its dreadful effects, and they perceive with indifference, as it were, an object at a distance, which on nearer approach would almost paralyze their senses.

That persons and commerce may be as little impeded as the nature of circumstances will admit, a certificate is always obtained by persons coming from places where any of these distressing maladies are of frequent occurrence; by this means, the general safety is more strongly secured, as well as less impediment given to the trader and the traveller; because when it declares the country free from any infectious disease or distemper, no further detention is generally required, than is necessary to transmit the case to the consideration of those who are intrusted with the general safety. If on the contrary the certificate states, that an infectious distemper does prevail at such place at the time of their departure, or if no certificate is brought, the examinations are more minute, and the purifications are of longer duration.

It is not intended in this article to say any thing of the nature of infectious diseases; they will be found in the previous work under the heads *Epidemical Diseases*, *Plague*, *Yellow*

QUARANTINE.

Yellow Fever, Contagion, &c. to which the reader is respectively referred. A succinct account only will follow of such enactments and orders as have been made with the view of securing the performance of quarantine, and that the necessity and value of these regulations may be more generally known.

Much pains and inquiry have been instituted for considering the most effectual means for preventing the introduction, and of the steps most necessary to be adopted, in case of the sudden appearance of the plague, both with regard to the treatment of the persons and their houses, as well as their dealings and communication with each other; whereby such instructions can on any emergency be immediately issued, as must check the extension and deprive the malady of half its inveteracy and of half its terrors.

Besides this, so much more air has been admitted to large and manufacturing towns than formerly, so much more cleanliness secured by underground drainage, as well as among the lower classes, that in addition to their better condition generally, in point of food, and the treatment of febrile complaints being better understood, its recurrence or virulence must be considerably lessened. Apprehensions and false alarms will, at times no doubt, be created among weak and credulous persons, and it will be most judicious in the local magistracy, immediately to institute rigid inquiry into the rumour, and either to take prompt measures to contradict it, and thereby prevent unnecessary alarm, or to adopt such speedy steps as will secure those deemed infected from having intercourse with others who are in health, until his majesty's privy council can issue such directions as the case may require, which they are specially authorized to do by 45 Geo. III. ch. 10, sect. 12. So much is the privy council on the alert in this respect, that it directed, and deemed prudent for the safety of the community, to have three vessels sunk a few years ago, having cargoes of skins from Mogadore on board, under very strong suspicion of their harbouring the plague.

It will not here be necessary to make an enumeration of the many acts that have been passed respecting quarantine, since they were all repealed, (except so much of the 39 & 40 Geo. III. c. 80. as repealed the former acts,) by the 45 Geo. III. which passed 12th March 1805, and which embodies many of the former provisions and enactments. Three other acts have passed subsequently, (46 Geo. III. c. 98. 50 Geo. III. c. 20. and 51 Geo. III. c. 46.) making further provisions and amendments; and several general orders in council have been published in the London Gazette, by authority of, and in furtherance of those laws; and which have equal force with the laws themselves. Indeed but for the levying of duties, and the infliction of pecuniary penalties and capital punishments, it is conceived acts of parliament would have been unnecessary, for by the common law the king is invested with the care of the public health, and his edict must of necessity have been binding on the subjects residing in or trading to this country. But to return: the 45 Geo. III. c. 10. in the first place, declares what ships, persons, and goods, are liable to the performance of quarantine. They are,

1. All ships and vessels (including his majesty's ships of war) arriving from or having touched at any place, from whence his majesty shall declare it probable the plague or other infectious disease or distemper may be brought, and all persons, goods, wares or merchandize, packets, packages, baggage, wearing apparel, books, letters, or any other articles whatsoever, on board the same. (Act, sect. 10.)

[*Note.*— This is deemed to relate to the outward as well as the homeward voyage. By 5 Geo. III. c. 25. sect. 3.

letters are to be given to the superintendent, who is to dispatch the same in the usual manner, after due precaution.]

2. All ships, vessels, and boats, receiving any person, goods, wares or merchandize, packets, packages, &c. out of such ships, whether they came or were put on board the same, either before or after the arrival of such ships at any port in Great Britain, or the islands of Guernsey, Jersey, Alderney, Sark, or Man, and whether they were bound to Great Britain or not. They are likewise deemed to be liable from the time of the vessels leaving such infected place, or from the time when such person or goods went or were received on board such vessel. (Act, sect. 10.)

3. Ships and vessels importing certain goods, more especially liable to retain infection, (to be set forth in any order in council,) and which may be carried from infected places into other countries, and from thence imported into Great Britain, are liable to all such regulations and restrictions as are made concerning quarantine. (Act, sect. 11.) For the goods, see Clafs 1 and 2.

4. Ships and vessels coming from any place in Europe, without the freights of Gibraltar or America, (where there is not a regular establishment of quarantine,) having on board any goods enumerated in the first class, the produce of Turkey, or Africa within the freights, or West Barbary, and all ships and boats receiving such goods out of such ships, are, together with all persons, (and pilots,) goods, &c. to perform quarantine, as ships coming from the Mediterranean with clean bills of health (which is fifteen days). Order in council, 5th April 1805, sect. 5.

5. But by order of the prince regent in council, 26th April 1817, ships which have sailed from ports deemed liable to infection, to others which are not liable to infection, and afterwards arriving here, shall not be liable to perform quarantine, if they come in ballast, or with a cargo taken in at the last-mentioned port, if the master shall make oath that all the goods of the first and second classes were landed or otherwise discharged at the latter port forty days at least before her arrival in Great Britain, and that no plague, &c. existed on board at any time from the commencement of the outward voyage to the termination of the homeward one; and provided also, that the goods taken on board at the port not liable to infection are not the growth, &c. of any country declared liable to infection; or if any goods of Class 1. taken in at a place not deemed liable, shall be the produce of any country deemed liable, then on proof according to the 43d section of order in council of 5th April 1805, that such goods have performed quarantine at one of the foreign Lazarets.

6. Ships and vessels also arriving from any place whatever, under any alarming or suspicious circumstances as to infection, are liable to such regulations and restrictions as are made by any order of his majesty (act, sect. 11.); or by any three of the lords of the council, in case of any unforeseen emergency on any ship arriving with any infectious disease on board, or if any infectious distemper has appeared in the course of the voyage, although she shall not have come from any place from whence his majesty has declared it probable the plague, &c. may be brought. (Act, sect. 12.) And all such ships and boats, and all persons, (including pilots,) goods, wares, &c. whether imported or put on board such ships, boats, &c. as well as on board the receiving ship, shall be obliged to perform quarantine in such places and manner, and for such time, as shall be directed by his majesty's order in council, published in the London Gazette; and that until they have performed and been duly discharged from quarantine, they shall not come or be brought

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brought on shore, or go and be put on board any other ship, &c. in order to go on shore, though such ship may not be bound to Great Britain, unless by directions and permission of his majesty in council. And all ships and boats, persons, pilots, masters or commanders, goods, wares or merchandize, coming from such restricted or any infected place, shall be subject to all the rules, regulations, and provisions of the act, and any order in council, and to all pains and penalties, &c. of that act for any breach or disobedience to it, or of any order in council made under its authority. Sect. 10. of the act.

By the 46 Geo. III. c. 98. his majesty, or any of the lords of the council, as often as they shall apprehend that the yellow fever, or other highly infectious distemper, prevails in America, or the West Indies, may require every vessel coming from or having touched at those places, to come to anchor at certain places to be appointed by the commissioners of the customs, for the purpose of having the state of health of the crew ascertained before she shall be permitted to enter any port in Great Britain; but the ship shall not be deemed liable to quarantine, unless it shall be afterwards specially ordered under that restraint. Sect. 6.

Shortly after the passing the act of the 45 Geo. III., and under its immediate authority, an order in council was issued, dated 5th April 1805, which declared what places his majesty judged it probable the plague, or other infectious distemper or disease, may be brought from. *They are* by vessels coming from or through the Mediterranean, or from the West Barbary on the Atlantic ocean, and also by the importation of certain goods being the growth or produce of Turkey, or Africa within the freights of Gibraltar or West Barbary, from any port in Europe without the freights, or on the continent of America. And by further order, dated 7th November 1805, it was declared, that an infectious disease might be brought by vessels coming from or having touched at any port in the states of Pennsylvania or New York, but this order has since been annulled.

The Goods deemed most liable to retain infection are set forth in three tables, by sect. 33, 35, and 38 of the order in council, and are as follow :

CLASS I.—Apparel; artificial flowers; baft, or any article made thereof; beads, bracelets, or necklaces, in strings; beds, bed-ticks; books; brooms; brushes; burdets; camblets; canvas; carmenian wool; carpets; cordage not tarred; cotton wool, yarn, or thread, all articles wholly made of or mixed with cotton, silk, wool, thread, or yarn; down; feathers; flax; furrers' waste; goats' hair; gold or silver in thread, cotton, hair, silk, or wool, or any other substance hereinbefore enumerated; program; hats, caps, or bonnets of straw, chip, cane or any other material; hemp; hoofs; horns and horn tips; hair of all sorts; leather; linen; liquor of any kind, in bottles or flasks; lute-strings, catlings, or harp-strings; maps; mattresses; mats and matting; mohair yarn; nets, new or old; paper; packthread; parchment; pelts; plating of baft, chip, cane, straw, or horse-hair; quilts; rags; sails and sail-cloth; silks, *viz.* crapes and tiffanies, hulks and knubs, raw silk, thrown or organzine silk, waste silk, wrought silk; skins, hides, and furs, and parts or pieces of skins, hides, and furs, whether undressed, or in part or wholly tanned, tawed, or dressed; sponges; straw, or any article made or mixed with straw; stockings; thread; tow; vellum; whisks; wool, whether raw or anywise wrought; yarn of all sorts.

CLASS II.—Senna; jalap; gum arabic; gum tragacanth; myrrh; opium; scammony; antimony; cantharides; alum; juniper-berries; pomegranates, flowers and seeds; sal nitre;

sal ammoniac; madder; fumach; galls; tobacco; coffee; wood in raspings; cork.

CLASS III.—Grain; pulse, and other feeds in bulk; grain, and other feeds in sacks or calks, or baskets of ruff mat; dried fruits in baskets, or packages made of articles enumerated in the first class, or in packages of wood and oil in barrels.

Where vessels are to perform quarantine depends upon circumstances; for if the plague, &c. appears on board any ship *within the freights of Gibraltar*, she is to go to one of the foreign lazarets (at Malta, Ancona, Venice, Messina, Leghorn, Trieste, Genoa, or Marseilles); but if it appears *without the freights*, then she is to go to the harbour of St. Helen's-Teau and North Withel, (two of the islands, called the Scilly islands,) or such places as his majesty shall appoint. (Sect. 13. of the act.) And immediate intelligence shall be given to the commissioners of the customs, and to the privy council, so that measures may be taken for the comfort and support of the crew and passengers, and such precautions used as the case may require; and the ship is to remain there, and none of the crew or passengers are to go on shore, or have any communication with any other vessel; and any person who shall not act conformable hereto, or any directions of the privy council, are to suffer death without benefit of clergy. If the vessel cannot make those islands or other places appointed, or shall be forced by stress of weather to go up either of the Channels, she shall not enter any port in Great Britain, or the islands of Guernsey, Jersey, &c. but shall remain in some open road till the master receives direction from the privy council. Sect. 13. of the act.

The next regulation is, that ships *not having the plague* on board, coming through the Mediterranean, or West Barbary, *without clean bills* of health, (except ships of war, transports, or other vessels in the actual service of government, which are to go to the Motherbank near Portsmouth, in a place marked out with yellow buoys,) and all ships receiving goods out of them, are to perform quarantine at Stangate Creek, and no where else. (Order, sect. 4.) But by order 15th July 1813, ships not having the plague actually on board, (except king's ships, &c. coming from or through the Mediterranean, or West Barbary, without clean bills of health, bound to the western ports of Great Britain, may perform quarantine at Milford Haven.

The 46 Geo. III. c. 98. sect. 7. authorizes his majesty or the privy council to prohibit (by proclamation or publication in the Gazette) any person, ships, or boats from going within the limits of any station which may be assigned for the performance of quarantine by ships without clean bills of health, under the penalty of 500*l.* By orders in council, dated 21st July 1806, and 6th September 1811, it was ordered, that no ship or boat (except quarantine and custom-house boats) should go, but on cases of emergency, within the place at the Motherbank set out with yellow buoys for ships not having clean bills of health; and that ships with clean bills of health ordered to the Motherbank are to go within the compass of the yellow buoys, but separate from his majesty's ships and ships without clean bills.

The two west buoys are placed to the eastward of Wootton Creek, and the two north ones near the Isle of Wight, with another buoy midway between them, and a red buoy as a mark for a burying-place.

By sect. 2. of the order of 5th April 1805, ships (king's ships as well as others) with clean bills of health, Bound to London, Rochester, Faversham, or any creeks or places belonging to or within any or either of the above ports, } are to perform quarantine at Stangate Creek.

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[*Note.*—In the case of ships coming from Turkey, and obliged to perform quarantine before their entry into the port of London, it is usual for the consignee to fend down persons at his own expence to pack and take care of the goods; and where a consignee had omitted to do so, and the goods were damaged by being sent loose to shore, it was held that he had no right to call upon the master for a compensation. *Dunnae v. Jolliffe*, before lord Kenyon, chief justice, at Guildhall, M. T. 1789.]

Ships bound to Leigh, and the ports and creeks extending from thence to, and including Berwick,	Whitebooth Roads, between Hull and Grimby.
— bound to Carlisle, and the ports and creeks extending from thence to, and including Beaumaris and the Isle of Man,	Bromborough Pool, or Milford Haven, by orders, dated 18 Oct. 1809, and 27 June 1810.
— bound to Sandwich and Cowes, and the ports inclusive,	Motherbank near Portfmouth.
— bound to Poole and Scilly, and the ports inclusive,	St. Ives' Pool, within the harbour of Falmouth.
— bound to Bridgewater and Swansea, and the ports inclusive,	King's Road and Portfmouth Pill.
— bound to St. Ives and Aberystwith, and the ports inclusive,	Milford Haven.
— bound to Jersey, Guernsey, Sark, or Man, or any part of them,	The Motherbank, or St. Ives' Pool.
— bound to Leith, and all the ports or creeks extending from thence along the eastern coast of Scotland, as far as and including Aberdeen,	Inverkeithing Bay.
— bound to Glasgow, and all the ports or creeks extending along the western coast of Scotland, as far as and including Wigtoun,	Holy Loch, in the Frith of Clyde.
— bound to Inverness, and all the northern coast of Scotland, as far as and including Stornaway,	Inverkeithing Bay, by order 21 July 1806.
— bound to Dumfries and Kirkcudbright, and all the ports and creeks on the south-west coast of Scotland,	Holy Loch, by order 21 July 1806.
— bound to any port or place on the coasts of England and Scotland, not within any of the before-mentioned limits,	At the nearest of the above stations to the place to which she is bound; and

Vessels liable to quarantine, and having a clean bill of health on board, which are bound to any of the above ports, and have passed the place appointed to perform quarantine, either from the master's ignorance of being liable, or by stress of weather, or other unavoidable circumstance, may, on proof on oath that it was unintentional, and not with the view of avoiding the regulations of quarantine, repair (and shall be compelled to go) to any other place at the discretion of the quarantine assistant, &c. keeping the proper signal flying during the whole time. Order, sect. 6.

When any country or place is known or suspected to be infected with the plague, &c. then, whenever any ship shall attempt to enter any port in Great Britain, or the islands of Guernsey, &c. she shall be visited by the superintendent of quarantine, or proper officer of customs; and the master, upon being desired, (for which purpose he or the pilot is to bring to, under penalty of 100*l.*) shall give a true answer in writing to all such questions and interrogatories as shall be put to him; and if he refuses to make a true discovery in any of the particulars, or if he shall give a false answer, (though not

upon oath,) he shall forfeit 200*l.* (Act, sect. 18.) If it appears by such answers that he is liable, the superintendent shall direct her to repair forthwith to the proper place, and she shall not enter any other place, (except from stress of weather or damage,) and she may be compelled, by all necessary means, (either by firing of guns upon her, or any other kind of necessary force,) to go to the proper place. (Order, sect. 8.) And if the master does not cause such ship to be conveyed to the place appointed, he shall forfeit 500*l.* 45 Geo. III. c. 10. sect. 21.

Vessels not bound to this country are not to touch at or attempt to enter any port in Great Britain, or the islands belonging thereto, although they may be ports appointed for performing quarantine (except for orders, or in consequence of stress of weather, or loss or damage at sea); and then the masters are to answer the preliminary questions, and to conform to all such directions, as they shall receive, as well with respect to their continuance at such ports, and departing and repairing to any other place, as to all other regulations, &c. touching quarantine; and if they do not comply, they may be compelled to put to sea; to aid which, the commander, or other officer of his majesty's ships of war, may be called in. Order, sect. 7, and 45 Geo. III. c. 10. sect. 19.

The duration of quarantine depends upon circumstances; as, the country from whence the ship arrives, the kind of goods she brings, the production of a bill of health, or otherwise. And the commencement is to be taken for ship and goods (where the cargo consists of goods of Class I. and II., and goods non-enumerated), when the whole of the two former are removed. (Order, sect. 39.) But if there are no goods of those classes, then from the time of the vessel's arrival at the quarantine station. (Sect. 12.) And for ships without bills of health, but with cargoes not enumerated in the two classes, and not deemed infectious, from the day the quarantine guardians are put on board. Order, sect. 40.

The lords of the council may issue orders for shortening the time of quarantine performed by particular ships, persons, or goods, &c. or for wholly releasing them, absolutely or conditionally, as they shall think fit. 45 Geo. III. c. 10. sect. 12.

The duration for ships performing quarantine is as follows:—

Ships having the plague on board, and arriving under any alarming or suspicious circumstances, the time is left to the discretion of the privy council. 45 Geo. III. sect. 12 and 13.

Ships coming from or through the Mediterranean or West Barbary with clean bills of health, having on board goods of Class I. and II., fifteen days. Order, sect. 12.

Ships arriving without clean bills of health, thirty days. Order, sect. 37—40.

Ships arriving from places in Europe without the freights, or on the continent of America, where there is not a quarantine establishment, bringing goods of the 1st Class, the produce of Turkey, or Africa within the freights, or West Barbary, to perform quarantine for fifteen days. Order, sect. 5.

Ships bringing touched, *i. e.* suspected bills, to perform quarantine for twenty days. Order, sect. 41.

The time for passengers and the crews of vessels performing quarantine is to be governed by the nature of the cargoes of the respective vessels, and whether they come with or without bills of health.

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The duration for goods performing quarantine to be as follows:—

Goods of the 1st Class, coming *without clean bills of health*, forty days at the lazaret. Order, sect. 33.

Goods of the 2d Class, coming *without clean bills of health*, thirty days. Order, sect. 35.

Goods remaining after those of the 1st and 2d Class are removed to a floating or land-lazaret, are to perform quarantine for thirty days, and are to be afterwards fumigated. Order, sect. 37.

Goods arriving from or through the Mediterranean, or West Barbary on the Atlantic ocean, in ships not having the plague on board, *without clean bills of health*, to be removed to the floating lazaret at Stangate Creek, and perform quarantine for thirty days. Order, sect. 14. and 40.

Goods coming from those places *with clean bills of health* are to be aired one week in the same ship; except goods of Class I. and II., which are to be removed to the lazaret, and be aired for fifteen days. Order, sect. 13.

Goods coming in ships with *suspected bills of health* to be treated as ships coming without bills of health, except that they are to perform ten days less quarantine. Order, sect. 41.

Dried fruits having been shifted from baskets and packages made of articles in Class I., or considered susceptible, if all the persons on board are in health may be delivered in twenty days. Order, sect. 38.

Dried fruits in wood, may be delivered in ten days. Order, sect. 38.

Oil in barrels, the bungs being tarred, and the barrels brushed and dipped in sea-water, may be delivered in ten days. Order, sect. 38.

Grain, pulse, and feed in bulk, or in sacks, or casks, or mats, when shifted, and passed through a sieve, may be delivered in ten days. Order, sect. 38.

And the packages, when made of susceptible articles, are to be sent to the lazaret to perform quarantine, according to the nature of them, or be destroyed at the option of the owner. Sect. 38.

Formerly the 42d clause in the order in council required "the production of a declaration on oath for goods of the 1st Class," when brought from places without the freights of Gibraltar, or on the continent of America, &c. to ascertain their growth, and that they were not the produce of Turkey, &c., but that clause has been suspended by order of 8th Aug. 1810; and they may be admitted without performing quarantine, on the master making oath that no infectious disorder prevailed at the place from whence they sailed, or on oath of the importer that they are not the produce of Turkey, or of any place in Africa within the freights, or West Barbary: but whenever that declaration is produced, the oath of the master or of the importer is not required. Order in Council, 27th Oct. 1818.

Vessels having performed quarantine at any of the foreign lazarets, and producing proper documents to prove that fact, are not required to do so again: nevertheless, such part of the cargo as consists of articles in Class I. are to be taken out and perform quarantine in the usual manner for fifteen days (Order, sect. 43.) But no goods are to be landed or removed therefrom until the master has given notice to the quarantine superintendent, or officer of customs, in order to be laid before the privy council. Landing or removing them, before directions are given, or contrary thereto, subjects the master to the penalty of 200*l.* 45 Geo. III. sect. 22.

Having thus stated what ships and goods are liable and required to perform quarantine, and the time for which they are to perform it, we shall proceed to state the manner of

doing it, which is to be by opening and airing in the manner directed by order in council (Act, sect. 29,) according to the nature of the goods, and the articles of which the packages are made.

Goods of the 1st Class, unaccompanied with a clean bill of health, undergo two performances, one *probationary*, the other of longer time and greater precaution. The hatches of the vessel are first to be opened, and as many of the bales as can be ranged upon the deck are to be taken from the hold, (as soon as the pilot and passengers are removed,) and the ends opened, and the contents handled by the sailors, under directions of a quarantine guardian for six days; and after this, any further parcels are only required to be opened and aired for three days, unless any suspicious circumstances arise, and then the time may be extended to four, six, or eight days, so as to complete in the whole twenty-one days, or even a longer time if necessary, and then they are to be conveyed to the lazaret. Order, sect. 32.

In the second performance, or expurgation at the lazaret, all bales of cotton are to be opened from one end to the other, and so much removed as admit the handling and removing the remainder. Rags, raw wool, goats' wool, Carmania wool, and hair, are to be taken out and ranged in heaps of four feet high, and often rummaged. Bales of silk to be opened on one side, from end to end, the cords loosened, and the silk aired for twenty days; then the other side to be opened in like manner for five days more. Cottons, yarn, thread, stuffs, and linen, are to be piled in rows or pyramids, and turned every four days, and completely spread out and suspended on cords for several days. Paper, books, parchment, sponges, and stockings, are to be unpacked and separated, so as to admit thorough airing. Feathers, straw-hats, artificial flowers, coral beads in strings, and brushes, spread out in the same manner. Carpets, furs, hides, and skins to be unbaled, and each piece spread and suspended on cords in the open air, and frequently turned; and all goods packed with straw, cotton, or articles stated in Class I., shall be entirely taken out of the same, opened, and handled, and carefully aired, as well as all other goods in that class, for which no directions are given. Order, sect. 34.

Goods of the 2d Class, unaccompanied with clean bills of health, though less liable to infection, are to be carried to the lazaret, and be unpacked, opened, and aired as much as possible; and by moving them as much as practicable from time to time, so as to admit free ventilation for thirty days. Order, sect. 35 and 36.

Goods not mentioned in those classes, and remaining on board the importing ship, are to perform quarantine for thirty days, by being frequently swept and shifted, so as to admit a free ventilation; at the end of which time, if all the persons on board, and those employed in the expurgation on shore, are well, the ship, goods, crew, and passengers, are to be fumigated and discharged. Order, sect. 37.

There are other regulations and enactments on this subject which it is necessary to notice, and though they relate to the first arrival of the ships, and take effect from that time, yet being rather regulations to ascertain the nature of the voyages, and the state of the crews, and the goods composing the cargo, than any part of the performance of quarantine, this is conceived a proper place to introduce them.

It is manifest, that without the earliest information of the arrival of vessels from countries infected with the plague, &c. and of the kind of goods of which their cargoes are composed, many of the above-mentioned salutary regulations would be useless, either by persons quitting vessels immediately

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diately on their arrival, or from having intercourse with other ships, or with the shore, or by breaking bulk and sending goods into the common stock of the country. To this end, the law has imposed the necessity of the masters of ships liable to quarantine shewing proper signals by day and night, by which the quarantine officer and others are apprized of their arrival; and to prevent any abuse herein, for the purpose of covering any smuggling transactions, persons exhibiting them, when not liable to quarantine, are liable to 200*l.* penalty by 45 Geo. III. c. 10. sect. 15. And as persons, especially passengers, may innocently render themselves liable to those penalties, as well as those statutes which affect their lives, it is necessary they should be let out for their information. The severity that has been annexed to the violation of the quarantine regulations is a sufficient proof how irksome the constraint is, and how regardless persons are to the general safety of others, for nothing short of imposing the penalty of death, on a violation of some of the enactments, has been found sufficient to impose respect to the law on this subject.

By 45 Geo. III. c. 10. sect. 14. ships subject to quarantine are required at all times, when they meet any other ship at sea, or shall be within four leagues of the British or Irish coasts, or the islands of Guernsey, Jersey, Alderney, Sark, or Man, to have a signal hoisted, to denote that they are so liable, which they are to keep hoisted so long as they remain in sight of such ship, or are within such limits of the coast, until they shall have arrived at their quarantine port, and been legally discharged. The signals are to be, by day, a large yellow flag at the mast-head; for which purpose, every ship leaving Great Britain for the Mediterranean, or West Barbary, or any place suspected or liable to have the plague, &c. shall be provided with one or more quarantine signal-flags and lanterns, and proper materials and instruments for fumigation and immersion, and shall keep them on board, to be used upon the ship's return (Order, sect. 45.); and if coming without clean bills of health, then with the addition of a large black spot in the centre; and by night a lantern with a light therein, also at the mast-head; on failure whereof, the master is subject to a penalty of 200*l.* (45 Geo. III. c. 10. sect. 14.) Ships actually having the plague on board are to hoist a signal flag of yellow and black, borne quarterly, of eight breadths of bunting at the main-topmast-head; and in the night two lanterns, one over the other, to be kept up when in sight of any other ship, or within four leagues of the coasts or islands, and until arrived at the proper quarantine port, and legally discharged from quarantine, upon penalty of 200*l.* 46 Geo. III. c. 98. sect. 1.

Masters of ships are also further required by sect. 16. of the act of the 45 Geo. III. to give the pilot who shall go on board a written paper containing a true account of the places at which they have touched or loaded on the homeward voyage, and any neglect or refusal, or any false representation, or wilful omission therein, subjects them to the penalty of 200*l.* And by the 46 Geo. III. c. 98. sect. 2. masters of ships that are not liable to quarantine in respect of the place from whence they come, are also to give a true account of all the different articles of their cargoes, under the penalty of 200*l.* And if by proclamation or order in council, ships are liable, as coming from any place mentioned in any order in council, or by reason of bringing any goods mentioned in such order, the pilot is to give the master notice of being liable, so that he may hoist the proper signal, under the penalties of 50*l.* and 100*l.* by the 45 Geo. III. c. 10. f. 16. and 46 Geo. III. c. 98. f. 2. Pilots, not conducting ships to the proper places, (except

prevented by stress of weather, adverse winds, or other accidents,) to forfeit 100*l.* (45 Geo. III. c. 10. f. 17.); and not requiring such paper, 100*l.* by 46 Geo. III. c. 98. f. 2.

Masters knowing any place from which they came, or at which they touched, to be infected with the plague, or any infectious disease, or having any person on board infected with it, and who shall refuse or neglect to disclose the same when examined by the superintendent of quarantine, or officer of customs, and omitting to hoist the proper signals, shall be guilty of felony, and suffer death. 45 Geo. III. c. 10. f. 19.

Masters of vessels ordered to perform quarantine are to deliver to the officer of customs, or quarantine superintendent at the quarantine station, (and which they are required to demand,) their bills of health, manifest, log-book, and journal, under penalty of 100*l.* 45 Geo. III. c. 10. f. 20.

Masters of ships liable to quarantine, although the plague, &c. shall not have then appeared, who shall quit the ship, or suffer any seaman or passenger to quit the same, till they have performed quarantine, (unless by licence or order in council,) shall forfeit 500*l.* And if any person coming in, (or any pilot or other person who may go on board, whether before or after her arrival at any port in Great Britain,) shall afterwards quit her before she shall be regularly discharged, all persons (by necessary force) may compel such person to return on board; and every person so quitting such ship shall forfeit 200*l.* and be imprisoned six months. 45 Geo. III. c. 10. f. 21.

Such of the passengers and crew of ships not furnished with clean bills of health as may be desirous of performing quarantine in a separate vessel, (to be hired at their own expence,) may, if the superintendent and medical assistant see no objection thereto, do so, and may quit the ship before the hatches are opened and go on board such ship, (a guardian being there placed at their expence) for thirty days (Order, sect. 28.); but their baggage, apparel, and books, for which they have not immediate occasion, shall be sent to a floating lazaret to be aired, and before any passengers or crew shall be discharged, they, their clothes, and effects, shall be fumigated (Order, sect. 31.); but passengers and the crews continuing on board the ship in which they arrived are to remain under quarantine till the ship be discharged. Order, sect. 28.

Pilots may quit the ship and be removed to the hospital ship, after the quarantine guardians are placed on board, provided they come from ships having no suspicious sickness on board; but if otherwise, they are to be sent to the pest-house, or other place appointed for persons so affected, and they are to continue under quarantine until the probationary airing of the goods is finished, when, if they continue well, they are to be fumigated and discharged. But such pilots are not to have communication with any other person, except under the regulations usual in like cases. Order, sect. 37.

If any pestilential accident occurs among the ship's crew or passengers during the probationary airing, (at whatever stage it may happen,) the quarantine of the crew, passengers, and pilot, (if any shall have been on board,) and the goods, is to recommence, and the sick are to be sent to the hospital, or pest, or place provided for persons so afflicted, the external guard to be doubled, and notice immediately given to the privy council. Order, sect. 29.

If any person falls ill, and a medical man is on board, he shall confer with the medical man who comes alongside, the latter keeping ten feet to windward; but if no medical

man

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man is on board, and it is necessary to visit the sick, the visit shall be made at the ship's boat by the medical attendant in his own boat, keeping to windward ten feet; and if medical aid cannot be administered on board, the sick is to be carried to the pest or hospital ship. Order, sect. 23.

Persons under circumstances to induce a suspicion of having any pestilential disorder, to be removed to the pest or hospital ship; but if it is not infectious, they may be removed to a more commodious apartment in the lazaret, there to complete the remainder of their quarantine. Order, sect. 24.

If any pestilential disorder shall actually discover itself in any ship or lazaret, the person is to be removed with all possible care and dispatch, under the special directions of the superintendent or medical assistant, to the pest-house, and a proper attendant is to be assigned to him, and he shall be visited at a due distance; but if a nearer approach is necessary, some person is to be specially appointed for that purpose. Order, sect. 25.

Paffengers and crews may have the assistance of any medical person they may choose from the shore; but if any persons communicate by contact with the sick, they shall perform the like quarantine as the sick. Order, sect. 26.

Persons liable to perform quarantine, and others having had intercourse with them (whether in ships or lazarets), are to be subject to the orders of the superintendent or officer of customs, who are required to enforce obedience to all such orders, and to call in others to their assistance; and they may compel all such persons to repair to the lazaret or ship, and cause all goods liable to quarantine to be conveyed there also; and persons refusing to go, or, who being there, shall escape, shall be compelled by force to return; and persons refusing or neglecting to return, and persons escaping, shall suffer death without benefit of clergy. (45 Geo. III. c. 10. sect. 23.) And may be seized by any constable, headborough, tythingman, or peace officer, or any other person, and be carried before a magistrate or justice of the peace, or such justice may issue his warrant for their apprehension and conveyance to their ship, or to any ship performing quarantine, or to any lazaret from which they have escaped, or for confining them in safe custody (but not in a public gaol) under such restrictions, as to having communication with other persons, as the justice may think proper, (calling to his aid medical advice) until they can be safely removed to some place appointed for quarantine, or until directions can be obtained from the privy council. 45 Geo. III. c. 10. sect. 24.

Persons not infected with the plague, &c. entering the lazaret whilst any person is performing quarantine, are to perform it also, and are not to return without licence or order in council; and, if they shall actually escape before it has been fully performed, they shall suffer death, without benefit of clergy. 45 Geo. III. f. 27.

Persons on board ship, or in a lazaret, may have communication with others by letter, to be collected by a boat, which is to go round at a fixed hour daily, and they are to be dipped in vinegar and put into the fumigating-box, and the covers slit open (Order, sect. 16.); but letters to persons on board are to be taken by the quarantine superintendent only, and no conference is to be had by persons *not* under quarantine with persons who *are* under quarantine (except by permission of or in the presence of the quarantine superintendent or his assistant), nor from any ship, unless the superintendent's boat be present, and then at the distance observed by the superintendent. And to prevent improper or clandestine communication, there is to be a night-watch and row-guard at all the quarantine stations; and the boats belonging

to any floating-lazaret are to be locked to the same; and the boats of the ships performing quarantine are to be taken away, and no use made of them, but for removing goods, from such ship, or upon occasions of necessity, till they are given up when the ship has done performing quarantine. Order, sect. 17.

Assistance and necessaries for ships under quarantine to be found by the superintendent and to be carried to the windward side, and delivered by means of buckets. (Order, sect. 18.) Quarantine guardians are to prevent any goods being delivered from ships without clean bills of health but by an order in writing from the superintendent, such order to be entered in a book and the original returned; and nothing to be conveyed from one ship under quarantine to another, nor any personal intercourse allowed. And a guardian is to go with the lighters and boats, to prevent communication during the transit of the cargo, and to take care that no remnants of cotton, or things of Clafs I. and II., remain in them. And before leaving off work they are to collect and deliver all such articles into the lazaret. Sect. 19 of the Order.

The duty of the quarantine superintendent and officers of the customs may partly be collected from what has gone before; but it is necessary here to observe, that they are, on a ship's arrival, to go off and put the following preliminary questions:—What is the name of the ship? Malters? From whence? Where bound? At what port has she touched on the homeward voyage, or what ships spoken with? Whether the plague, or any infectious disease, existed at the time of leaving the port she loaded at? What kind of goods the cargo is composed of, and of what country are they the produce? and whether she brings a bill of health?

If the ship is deemed liable to quarantine, she is then to be directed to the proper quarantine port, where, on arrival, the superintendent is to go to the windward side, (taking medical advice with him, if necessary,) and to see all the officers, crew, and other persons, multered on the gangway, and is to put further questions to them. They are in substance the same as above, except more particular as to the places the vessel touched at during the whole voyage; the respective dates of her arrival at every place, and dates of her departure; the number and conditions of the crew for the voyage, whether any have been sick or died, and the nature of the disease; whether their bedding and clothes were destroyed, or any person employed about them taken ill; if so, when, and what kind of disease; whether any letters or parcels have been received out of any other ship on the passage; of what kind and where delivered, and into what vessel or boat; what pilots she has had; and any particulars respecting British ships loading at the same port from whence she came; their names; where bound, &c. and what British ships were at the places at which she touched; whether any person employed in loading the cargo was taken ill, or any suspicion of the kind; whether the cargo had been long warehoused, or packed, handled, or brought on board by any person affected with the plague: did she touch at the isle of Rhodes, the Morea, or any and what part of Africa; if so, where? and had she any communication with the shore at those places, or with any ship coming from such places; if so, in what manner, and when, and whether the crew of such ship was healthy.

The answers to all these questions are to be taken in writing, and the master to make oath to them, and is to deliver the log-book, manifest, and ship's papers, (which are to be dipped in vinegar and fumigated,) and make oath to the truth of the contents of the former, or in what particular it is not correct; and whether any particular entry

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was made soon after the fact, and if not, for what reason; and also to make oath to all the other papers. Sect. 10 of the Order.

If any suspicious circumstances appear in the answers to the above questions, or from any other circumstance, the proper officer is immediately to transmit such answers to the privy council and the commissioners of the customs, and without regard to the bill of health, whether clean or otherwise, is to order such ship to a station distant from all other vessels, and put her under special guard, the more effectually to prevent communication with her. Order, sect. 11.

Ships coming without clean bills of health are to have two quarantine guardians placed on board as soon as the examinations are ended, and she shall have arrived at her proper station. Order, sect. 15.

Guardians are to take care that, after the cargoes are discharged into the lazaret, the holds and between decks are completely swept, and the sweepings burnt. (Order, sect. 20.) And they are to search all lockers and chests, &c. of passengers and crews, so that no goods in List 1 and 2, or any thing liable to infection, remains undelivered, except what the superintendent or medical man declares requisite for daily use; and they are to see all such chests, clothes, and the bedding of the ship daily opened and aired. (Order, sect. 21.) They are also to make daily reports of the state of health of every person on board, and whether the regulations are regularly complied with; and, in case of any impediment, are to give notice to the master, and then to the superintendent, who shall remove the same. Order, sect. 22.

Persons landing or removing any goods, wares, or merchandize, packets, packages, baggage, wearing-apparel, books, or letters, from any ship liable to quarantine, or knowingly receiving the same, are to forfeit, for every offence, not more than 50*l.*, nor less than 10*l.* And persons clandestinely conveying them (or concealing them for that purpose) from any ship actually performing quarantine, or from the lazaret, are to be adjudged guilty of felony, and suffer death without benefit of clergy. Act, sect. 31.

Officers of customs, or other persons embezzling goods, or guilty of any other breach or neglect of duty, in respect of the ships, persons, and goods performing quarantine, shall lose their office or employment, and be rendered incapable to hold the same, or receive a new grant thereof, and shall forfeit 100*l.* And if they shall desert their duty, or wilfully permit any ships, persons, or goods, to depart, or be conveyed out of the lazaret, ship, or other place, unless by permission under an order in council, and if they, or any person authorized to grant certificates of ships having performed quarantine, shall knowingly give a false certificate thereof, they shall suffer death without benefit of clergy; and if they shall wilfully damage any goods under their direction, they shall pay treble damages and costs of suit to the owner. 45 Geo. III. c. 10. sect. 26.

Persons forging, counterfeiting, interlining, or altering, any certificate required by this act, or any order in council touching quarantine, or procuring it to be done, or publishing it as true, shall suffer death without benefit of clergy. 45 Geo. III. c. 10. sect. 30. and 46 Geo. III. c. 98. sect. 8.

After goods have been duly opened and aired, proof thereof shall be made by the oaths of the master of the lazaret or vessel, and one of the guardians or officer of the customs, and the superintendent, shall give a certificate of such proof having been made, and such goods shall not be

liable to any further restraint, either at that or any other port. 46 Geo. III. c. 98. sect. 5.

Ships and persons having performed quarantine, proof is to be made by the oath of the master, and of two other persons belonging to the ship, before the principal officer of customs or justice of peace, at the port where quarantine was performed, or, if at the islands of Guernsey, &c. before two jurors, that such ships or persons have duly performed quarantine, and that they are free from infection. And, upon producing a certificate from the superintendent to that effect, the collector or justice, &c. is required to give a certificate thereof, and thereupon such ships and persons shall not be liable to farther restraint. 45 Geo. III. c. 10. sect. 28.

All forfeitures and penalties incurred against this act may be recovered in any of his majesty's courts of record, or by suit in any of his majesty's courts in the islands of Guernsey, &c. one half to them who shall sue, and the other to his majesty, to be applied towards defraying the expences of erecting and maintaining the lazaret. 45 Geo. III. c. 10. sect. 34.

Actions to be commenced in the name of the attorney-general, or of some officer of the customs, and the former may stop proceedings if he thinks proper, as well as to the officer's share as to the king's moiety. Sect. 35 and 36.

Offences against this act, not being felony, and disobedience to any order in council, for which no specific penalty is provided, may be tried before any two justices of the peace for the county, riding, &c. where such offence happens; and if any person shall be convicted he shall be liable to such penalty, not exceeding 50*l.* for any one offence, or to such imprisonment, not exceeding three months, as shall, in the discretion of the two justices, be judged proper. Such penalty to be applied as directed by sect. 34. 45 Geo. III. c. 10. sect. 38.

Offences contrary to this or any act hereafter to be passed, or of any order in council, notified by proclamation, or published in the Gazette, may be tried in any county within England or Scotland, or in the proper courts in the isles of Guernsey, &c. No attainder of felony to work corruption of blood or forfeiture of goods, &c. 45 Geo. III. c. 10. f. 39 and 42.

In any prosecution for offences against this act, or any act which may hereafter be passed, concerning quarantine, or for any breach of any order in council notified in the Gazette (which is to be a sufficient notice by 45 Geo. III. c. 10. sect. 33.), the answer to any questions or interrogatories put to the master of a ship, may be given in evidence as to the place from which such ship came, or the places at which she touched in the course of the voyage; and where any ship shall have been directed to perform quarantine, the having been so directed shall be evidence that she was liable, unless satisfactory proof shall be produced by the defendant that the ship did not come from or touch at any such place as is stated in the said answer; or that such ship, although directed to perform quarantine, was not liable. And where any ship shall in fact have been put, and shall actually be performing quarantine, such ship shall, in any prosecution, be deemed to be liable, without proving in what manner, or from what circumstances, such vessel became liable. 46 Geo. III. c. 10. sect. 40.

By the 43d section, offenders may plead the general issue, and if the plaintiff is nonsuited, or discontinues his action after the defendant has appeared, or if judgment has been given upon any verdict or demurrer against the plaintiff, the defendant may recover treble costs, and have the like remedy at law as the defendant hath in other cases.

Actions

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Actions to be brought within the space of two months after the offence is committed.

Whenever any person is charged with an offence against this or any other act, or in disobedience of any order in council concerning quarantine, and the same shall appear to any judge of the court of King's Bench by affidavit or certificate of an information being filed against such person, he may issue his warrant under his hand and seal, and cause him to be brought before him or a justice of the peace, that he be bound with two sufficient sureties to appear and answer such offence; and if such person shall refuse or neglect to become bound, he may be committed to gaol till he does so give bail, or be discharged by order of the court of King's Bench. The recognizance to be returned and filed in court, and remain in force until such person is acquitted, or until he has received judgment. (Act, sect. 41.) And if he is detained for want of bail, the prosecutor may cause a copy of the indictment to be delivered to him, or the gaoler, &c. with notice thereon indorsed, that if he does not in eight days enter an appearance and a plea of demurrer, an appearance and plea of not guilty will be entered in his name; and upon affidavit being made of such notice, &c. being delivered, the prosecutor may cause an appearance and plea of not guilty to be entered, and such proceedings shall be had as if the defendant had appeared and pleaded not guilty; and if upon a trial the defendant is acquitted the judge may direct his discharge. Act, sect. 41.

Where any examination or answer shall be taken on oath, the persons authorized to take such examinations and oath shall be deemed to have full powers to administer such oath; and if any person swears falsely, or procures others to do so, he shall be deemed guilty of perjury or subornation of perjury. 45 Geo. III. c. 10. sect. 37. and 46 Geo. III. c. 98. sect. 10.

The king may issue directions if the plague breaks out in Great Britain.—The lords of the privy council, in case any infectious disease breaks out in Great Britain, or the islands of Guernsey, &c. may make such order, and give such directions in order to cut off all communication between any person infected, and the rest of his majesty's subjects as shall appear to them expedient for that purpose. 45 Geo. III. c. 10. sect. 12. And if it shall happen that any part of Great Britain or Ireland, or the isles of Guernsey, &c. or France, Spain, Portugal, or the Low Countries, shall be affected with the plague or other infectious disease, his majesty may by proclamation restrain all small boats, and vessels under 20 tons, from sailing out of the ports of Great Britain or the islands, until bond is given by the master, with sufficient sureties for 300*l.*, that such vessel or boat shall not go or touch at any place mentioned in such proclamation, and that the master, crew, or passengers, shall not go on board any other ship at sea, nor receive any person on board at sea from any other ship, nor receive any goods out of any ship. And if any vessel for which such security is required, shall fail before security is given, she shall be liable to forfeiture, and the master and every mariner shall forfeit 20*l.* 45 Geo. III. c. 10. sect. 32.

By the stat. 1 James I. c. 31. if any person infected with the plague, or dwelling in any infected house, be commanded by the mayor or constable, or other head officer of the town or vill, to keep his house and shall disobey it, he may be enforced by the watchmen appointed on such occasions to obey such necessary command, and if any hurt ensue the watchmen are thereby indemnified. And further, if such person goes abroad and converses in company, if he has no plague sore upon him, he shall be punished as a vagabond by whipping, and be bound to his good behaviour. But if he has any

infectious sore upon him uncured, he then shall be guilty of felony. Blackstone, vol. iv. c. 13.

Having thus far given the laws and regulations concerning this matter, we shall state the duties payable by ships performing quarantine, with the exceptions provided by the act; and also the best methods of fumigating ships and houses. It must be apparent, that the nature of the quarantine establishments and maintaining lazarets incur considerable expences, to defray which the duties are to be applied (Act, sect. 8.); and the law 45 Geo. III. c. 10. sect. 3. declares, that it is reasonable the importers should defray the same; and sect. 6. enacts, that the ship-owners may recover of the importers such sums as the tonnage of their goods shall bear to the proportion of the tonnage of the ships. These duties are to be paid upon the ships clearing inwards, and to be computed according to the 26 Geo. III. c. 60. 45 Geo. III. c. 10. sect. 5. They are to be levied and recovered as duties of customs, and although not raised for the purpose of contributing to the revenue, the amount is to be carried to the consolidated fund. Sect. 7.

A Table of tonnage duties payable on ships and vessels, which ships or vessels, or the cargo of which, or any part thereof, shall have performed quarantine in Great Britain, or the islands of Guernsey, Jersey, Alderney, Sark, or Man. 45 Geo. III. c. 10. f. 3.

1. For every ship which shall have arrived from any part of Turkey, or from Africa within the streights of Gibraltar, or in the West Barbary on the Atlantic Ocean, with a clean bill of health, the ton - - -	} £ s. d. 0 7 6
2. Do. without a clean bill of health, the ton - - -	} 0 15 0
3. For every ship which shall have arrived from any place whatsoever, (except from any part of Turkey, &c.) with a clean bill of health, the ton - - -	} 0 3 0
4. Do. without a clean bill of health, the ton - - -	} 0 10 0
5. For every ship which shall arrive with any part of the cargo consisting of goods the growth of Turkey, or any place in Africa within the streights, or in the West Barbary, and which shall have arrived from any place whatever, the ton - - -	} 0 7 6
6. For every ship which shall have arrived under such circumstances as shall induce his majesty, or the lords of the council, to subject such ship to the like quarantine as ships coming from Turkey with clean bills of health, the ton - - -	} 0 7 6
7. Ships arriving under such circumstances as shall induce his majesty to subject such ship to the like quarantine as ships coming from Turkey <i>without clean bills of health</i> , the ton - - -	} 0 15 0
8. For every ship which shall enter inwards in the port of London, an additional duty of per ton - - -	} 0 1 0

Exempted from the said Duties.

Ships of war, transports, and other vessels employed in the service of government.

Ships or vessels not bound to Great Britain or the islands, and having put in in distress. (Although they should perform quarantine. Opinion of the attorney-general.)

Ships or vessels obliged to perform quarantine only on account of having goods enumerated in the 1st Class on board,

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board, and not producing the proper declaration or document as to their growth, &c.

Ships or vessels, with a clean bill of health, in ballast, or whose cargo shall consist wholly of falt, (unless coming from Turkey, or some place in Africa within the streights of Gibraltar, or in the West Barbary.)

Ships and vessels, which with their cargoes shall have performed quarantine in the foreign lazarets, and produce proper documents and vouchers attesting the same. (Or when goods, which have performed quarantine there, and been carried to other countries, are afterwards brought here. Treasury order.)

Ships and vessels rendered liable solely by reason of having received on board by force, and against the will of the master and crew, any person from a vessel coming from or having touched at an infected place. 46 Geo. III. c. 98. sect. 4.

Ships which have failed in ballast from places considered liable to infection, and which shall afterwards bring a cargo from a place not deemed liable to infection. Treasury order.

To prevent as much as possible the plea of ignorance of these laws, the order in council of 5th April 1805 directs, (sect. 44.) that the collector of the port where any vessel shall clear out for the Mediterranean or Barbary coast, or any other place respecting which an order in council is made, shall furnish the master with an abstract of the quarantine regulations, and it is to remain up during the voyage in some conspicuous part of the ship till his return, provided he returns in twelve months.

Ships of war which shall meet any vessel liable to quarantine coming to any port in Great Britain, or the islands of Guernsey, &c. are to take care to prevent the landing of any goods or persons, &c. until they shall be put under the direction of the quarantine superintendent, &c. (Sect. 46.) And the commanders of ships of war, and forts and garrisons on the sea coast, and all justices, mayors, sheriffs, bailiffs, chief magistrates, constables, headboroughs and tythingmen, &c. shall be aiding and assisting to the superintendent of quarantine and his assistants, and to the officers of the customs, and in bringing such ships to the places appointed for performance of quarantine, as well as in the due performance of the same. Order, sect. 48.

The commissioners of the customs are ordered to use their utmost vigilance and care that the regulations of the acts of parliament and orders in council be duly observed (sect. 47.) ; and the lords of the treasury, the lord high admiral, the lord warden of the cinque ports, and the master general and principal officers of the ordinance, his majesty's secretary at war, and the governors and commanders-in-chief of the said isles of Guernsey, &c. are to give the necessary directions herein as to them may respectively appertain. Order in council, sect. 50.

It now remains to state the best mode of fumigating vessels and apartments infected with infectious diseases, and to offer such hints as are applicable to the subject.

Odoriferous woods, gums; sweet herbs, and aromatics, have been recommended as fumigations, but with little certainty as to their effects; perfumes still less so; besides which, they rather conceal the mal-aria than correct contagion. The evaporation of common vinegar by heat is often employed as a fumigation, but it is not possessed of much power of diminishing the fetid odour of putrid air. The acetic acid or radical vinegar is better; its powers are however limited to a small space, and therefore, though it may be useful about the persons of those who attend the sick, it is inadequate to the purification of large rooms.

The stronger and better fumigations are the nitrous or marine acid, and the oxymuriatic acid vapour, the former of which is made thus: half an ounce of nitre reduced to powder and vitriolic acid (oil of vitriol) in equal quantities, mixed in small pots, and placed in various parts of the room.

Oxymuriatic acid, which is most powerful, is prepared thus:

Manganese	-	-	-	-	2 parts.
Common falt	-	-	-	-	4 parts.
Vitriolic acid, specific gravity 1.85	-	-	-	-	3 parts.
Water	-	-	-	-	1 part.

To a small quantity of the mixture of the manganese and falt, (suppose three ounces,) the whole of the water is to be added, (half an ounce,) and to this, in a pot large enough to prevent the ebullition from flowing over, add the vitriolic acid from time to time. This will keep up for twenty-four hours a discharge of the oxygenated muriatic acid, of which the smell is not unpleasant, and the vapour gives no annoyance to either the sick or the attendants.

Where houses or hospitals are highly infected with the plague, it will be necessary for them to undergo a stronger fumigation of sulphur, but that being attended with danger should only be done by persons properly acquainted with the manner of doing it; they should afterwards be white-washed, and the floors well scoured.

It may be stated once for all, that the great object of quarantine laws is the separating of those affected, or suspected to be infected with an infectious distemper, from those who are not, and nothing would be so salutary or absolutely necessary, wherever the plague breaks out, as instantly separating of the sick from those who are well; and this is best done by removing them to a proper place, rather than suffering them to remain with their family, which too frequently by that means becomes infected also.

Whatever is requisite to be done by way of fumigation will be found at large under that head; the following precautions are, however, proper to be known.

The clothes of the sick should at all times, when changed, be removed by tongs, and not by handling, and should be put into cold water and boiled for an hour, and afterwards be well washed in washing machines, and then fumigated; or they may be baked in an oven; but the safer mode would be to have them destroyed, especially if not valuable.

Those who attend about the person of the sick, as well as the medical men, should remain as short a space of time as is consistent with their duty, and to avoid as much as possible all contact with his person or his bedding, clothes, &c. And they might be furnished with gloves made of oiled silk, as well as dresses made of the same article. The cup or glass out of which he drinks should be immediately plunged into water or vinegar, as well as any article he touches or uses. Whatever he leaves of his meals should be burnt or wholly destroyed. The excrementitious discharges should also be received into cold water, and instantly removed out of the room. If the sick die, he should be immediately wrapped in oiled cloth or a tarpaulin, and be speedily buried at the depth of six or seven feet; which should be performed, without bustle, in the night time, without toll of bell, to prevent the alarming of others.

With respect to the bed and bedding upon which the sick has died, it would be best to have it burnt immediately; at all events, it must on no account be used till it has been baked in an oven for twelve hours (being rolled up and removed in a cart with every possible care, that it be as little handled as possible). It should be afterwards exposed to the open air for at least fourteen days before it is again used.

Furniture

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Furniture consisting of chairs, bedsteads, &c. should be scoured and fumigated with sulphur and saw-dust for twenty-four hours, first removing every person out of the apartment, as no living creature can exist in the fumes for any length of time.

Houses and apartments should be fumigated in like manner, and be afterwards purified by the admission of as much air as is practicable, and also by scraping and washing the walls with lime-water, and the floors with plenty of cold water.

And lastly, we cannot inculcate too much the fact, that the best preventive of infectious disease, and the surest mode of diminishing the effects of its contagion, is by the free admission of pure air, even in the room of the sick, who, to admit of its free circulation, should not have bed or window curtains, and by the greatest attention to cleanliness. By the removal of the rest of the inhabitants from the sick house to a place of observation, for the space of twenty days, and by the sick being also confined for an equal length of time, having persons appointed to prevent his escape, and to have a nurse assigned to him. Articles necessary for his support must be delivered by means of baskets or planks, as well as those received from the house, and all money received in payment to be dipped in vinegar.

Large assemblies should not be permitted to meet while towns are infected, and the theatres, churches, and markets should be closed; and if these precautions are strictly adhered to, we are confident that if the contagion cannot be wholly prevented, its spreading may be greatly confined, and its malignity considerably lessened.

QUARTZ. See **QUARTZ**, and **MINERALOGY**, *Appendix*.

QUASSIN, in *Chemistry*, the name which has been given to a bitter substance extracted from quassia. See **BITTER Principle**.

QUEEN ANNE'S. Add—It contains 16,648 inhabitants, of whom 6381 were slaves in 1810.

QUEMAKO, a township of Somerset county, in Pennsylvania, having 1302 inhabitants.

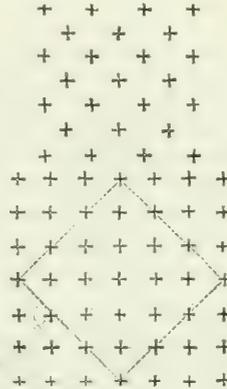
QUERCITRON. See **QUERCUS Tinctoria**, and **PRINTING on Galico**.

QUILOA. At the close, add—An island of Quiloa was visited by captain Beaver in 1812. He describes this island, which has been the seat of royal residence, since the foundation of the kingdom, at least 700 years, as being about six miles long and three broad; low and fertile, extending longitudinally across the mouth of a deep bay, having at either end an opening for two arms of the sea, and thus containing a peninsula which projects from the main land, forms two safe and magnificent harbours, capable of containing, in perfect security, the largest fleets. Of the ancient splendour and magnificence that subsisted when the Portuguese first visited this island, not a vestige remains. The present city, if it deserves the name, consists of a number of scattered huts from the borders of the sea to the shore. Here captain Beaver found the deputy of the Imam of Muscat, who controls the miserable Moors or Arabs who are in possession of the sea-coast, with his half a dozen of soldiers, situated in a round tower, mounting three guns, which pointed directly

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to the king's house, and at the distance of a musket-shot from it. By these means, he keeps the king of the extensive kingdom of Quiloa in awe, and levies a tribute in slaves, ivory, gold-dust, and many other articles exported from this part of the coast. The Moorish king is only the nominal sovereign both of the islands and of the shores of the continent.

QUINCUNX, l. 21, add—The notion, however prevalent, that plants thus set have greater scope than when set at the same distance without alternation, is perfectly imaginary: thus below it is evident, that the *square mode* becomes a quincunx when viewed angularly, and the quincunx, in like manner, becomes a square; and the distance of the plants is the same in both.



QUINTAL, col. 2, l. 3, add—The Castilian quintal is divided into 4 arrobas, or 100 lbs.; the lb. into 2 marcos, or 16 oz.; the marc into 8 drachmas, 16 adarmes, or 576 grains. The merchants commonly reckon 100 lbs. Castilian weight equal to 102 lbs. avoirdupois; but the more accurate proportion is as 123 to 125.

QUIRA, or **QUIRIA**, in *Geography*, a province of the ancient kingdom of Colchos enclosed by the end of the Mossian hills. It is a pleasant and fruitful country, and, from the ruins that still remain, we may conclude, that it was formerly flourishing and populous in an extraordinary degree. The residence of the prince of Quiria is Titi-zighi or Ighina (the ancient Pityus), situated on the shores of the Black sea, with a secure and spacious harbour. The only considerable river of Quiria is the Boas, which rises 30 versts from Titi-zighi, and after a course from E. to W. empties itself into the Black sea.

QUIRILIA, the only river of consequence in Immeria, or, as it is now called, Iberia. It rises in the Soanni ridges and being increased by the snow-streams which descend from the Georgian side of the Caucasus, enters the Phasis, in the neighbourhood of Cotatis.

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RACON, in *Geography*, a township of Gallia county, in Ohio, having 295 inhabitants.

RADIATION of Heat, a property of heat or circumstance belonging to it, which has been lately investigated and successfully illustrated by professor Leslie of Edinburgh. There are two modes in which heat is discharged from bodies. A portion is communicated to the contiguous matter, and is slowly diffused through it. Another portion, when the body is placed in an aerial medium, is discharged with rapidity, darts through the air to a distance, and even at that distance, when intercepted, produces a heating effect. This forms what is called the "radiation of heat." Mr. Leslie has discovered the important fact, that different kinds of matter, at the same temperature, discharge very different quantities of heat by radiation. From a metallic surface, the quantity is comparatively small; from a vitreous surface, it is much greater; and it is still more so from a rough spongy surface.

The power of different surfaces in discharging different portions of heat, in this mode, at the same temperature, Mr. Leslie ascribes to the more or less close contact which they admit with the external air; a vitreous surface, for example, admitting of a closer proximity of the air than a metallic surface does, and thereby communicating to it, in a given time, a larger portion of heat. And on the same principle he explains the fact, that those surfaces which are most powerful in thus discharging heat, are also most powerful in arresting and absorbing it; the closer contact into which the heated air comes with the surface on which it impinges, favouring the transfer of its heat; while a surface, to which the heated air does not approach so closely, will in a great measure reflect it with little loss of heat. Hence the discharging and absorbing power are proportional to each other; while the reflecting power is the reverse.

Some important practical applications resulting from these differences are suggested by the author.

A vessel with a bright metallic surface is the best fitted to preserve liquors either long warm, or as a conservatory to keep them cool. A silver pot will emit scarcely half as much heat as one of porcelain; and even the very slightest varnishing of gold, platinum, or silver, which communicates to the ware a certain metallic gloss, renders this new kind of manufacture about one-third part more retentive of heat. The addition of a covering of flannel, though indeed a slow conductor, far from checking the dissipation of heat, has directly the contrary tendency; for it presents to the atmosphere a surface of much greater propulsive energy, which it would require a thickness of

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not fewer than three folds of this loose substance fully to counterbalance. The cylinder of the steam-engine has lately been most advantageously sheathed with polished copper.

The progress of cooling is yet more retarded, by surrounding the heated vessel, on all sides, at the distance of near an inch, with a case of polished tin; and the addition of other cases, following at like intervals, augments continually the effect. With an obstruction of one case, the rate of refrigeration is three times slower, with two cases it is five times slower, with three cases it is seven times slower, and so forth, as expressed by the succession of the odd numbers. By multiplying the metallic cases, therefore, and disposing them like a nest at regular intervals, the innermost could be made to retain the same temperature with little variation for many hours or even days. Such an apparatus would obviously be well calculated for various culinary and domestic purposes.

In the conveyance of heat by means of steam, the surface of the conducting tubes should have a metallic lustre. On the contrary, if it be intended by that mode to warm an apartment, they should be coated on the outside with soft paint, to facilitate their discharge of heat. For the same reason, metallic pots are more easily heated on the fire, after their bottoms have become tarnished or smoked. If a bright surface of metal be slightly furrowed or divided by fine flutings, it will emit heat sensibly faster, because the prominent ridges, thus brought closer to the general atmospheric boundary, will excite the pulsations with augmented energy.

For the experiments which led to this discovery, and the conclusions deduced from it, we refer to his "Essay on Heat," and to a "Short Account of Experiments and Instruments depending on the Relations of Air to Heat and Moisture," 8vo. Edinb. 1814. See **HEAT**. See also **DÉW**, **RAYS of Heat**, and **REFRANGIBILITY of Radiant Heat**.

RADNOR, in *Geography*, a township of Ohio, in Delaware county, having 347 persons.

RAJAFooter, denotes literally the son of a king, and is used as the name of a warlike race of Hindoos.

RAIN. For Inverary *r. Inverarie*.

RAIN-GAGE, l. 4, for **LXIV. r. XVI.**; for *fig. 2. r. 10.*

RALEGH, col. 5, l. 2c, *r. 1601.*

RAM of M. Montgolfier. Add—See **WATER**.

RAMA, or **RAMAH**. Add—This was a common name applied to many places in the Holy Land: and it is suggested (see Clarke's Travels, vol. iv. p. 432.), that the modern village of Bethoor and the modern Rama are the places

places mentioned by St. Jerom, where he says, "Rama et Bethoron et reliquæ urbes nobiles a Salomone constructæ parvi viculi demonstaurantur." Rama was a village in the time of Jerom, and the situation of Bethoor is distinctly marked in the Apocrypha, with reference to the plain of Rama. (1 Maccab. iii. 16. 24.) (However, the prophecy of Jeremiah (xxxi. 15.) applied by St. Matthew (ii. 17.) to the murder of the Innocents by Herod is not believed to refer to the place now mentioned, but to another Rama, noticed by Eusebius.) The origin of Rama has been ascribed to the Moslems under Soliman, son of Abdolmelic, who is stated to have built the town with materials from the ruins of Lydda, distant three miles from Rama. But that this is an error may be evinced by reference to the writings of St. Jerom; who speaks of its vicinity to Lydda, and calls it Arimathea, from a prevalent opinion that it was the native place of Joseph, who buried our Saviour. Jerom's testimony, preceding the Mahometan conquest of the country, is sufficient to prove that the city existed anterior to the invasion of Palestine by the Moslems. Nevertheless it is possible that Rama, from having been a small village, might have become a large town under their dominion; nor does there seem much reason to doubt, that this Rama was the village mentioned with Bethoron by St. Jerom, as the only remains of the two cities so named, which were built by Solomon. According to Reland, the oldest writer who mentions Rama is Bernard the monk, who visited the Holy Land in the 9th century. Oriental geographers describe it as the metropolis of Palestine; and it is said that St. George, the tutelar saint of our ancestors in England, suffered martyrdom in this place; though others say, that his relics reposed in a magnificent temple at Lydda or Diopolis. Its distance from Jerusalem, usually estimated at a day's journey, is described as equal to 36 or 37 miles by Phocas; who distinguishes Armathem, the native place of the prophet Samuel, from Ramola or Rama, with which Adrichomius seems to have confounded it; and places the church of St. George within the latter city; which position, although disputed by Reland and other authors, not only seems to coincide with the testimony given from the Alexiad of Anna Comnena, but also with the evidence afforded by Bernard the monk, who mentions a monastery of St. George near to Ramula. There is not a part of the Holy Land more fertile than the plain around Rama; it resembles a continual garden; but cultivation had been neglected at the time of the arrival of Dr. Clark, the traveller now cited, owing to the dreadful plague which with the whole country had been infested. Rama and Lydda were the two first cities of the Holy Land that fell into the hands of the Christians when the army of the Crusaders arrived. Rama was then in its greatest splendour; a fenced city, abounding in all the luxuries of the East. It was exceedingly populous, and was adorned with stately buildings, and well fortified with walls and towers. The count of Flanders having been dispatched by the princes and generals of the Christian army, with five hundred cavalry, to reconnoitre the place, and to summon the city to surrender, found the gates open: the inhabitants, alarmed by the sudden approach of so powerful an army, had abandoned their dwellings and all their property during the preceding night. In consequence of this, a general rendezvous of the Christian forces took place in Rama, where they remained during three entire days, regaling themselves in the abundance the place afforded. During this time, Robert of Normandy was elected bishop of Rama and Lydda, to which bishopric all the revenues of the two cities and their dependencies were annexed; the

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whole army joining in thanksgiving to St. George the Martyr, the patron saint of Diopolis and Rama, to whom the auspicious commencement of the enterprise was attributed. Hence probably originates the peculiar confederation in which St. George was held by the inhabitants of England, during the early periods of its history.

RAMSBURY. By the returns of 1811, the parish of Ramsbury contained 398 houses, and 2095 persons; viz. 1028 males, and 1067 females: 248 families being employed in agriculture, and 85 in trade, manufactures, and handicraft.

RAMSDAL, dele.

RANDOLPH. Add—In 1810, their number was 1170; l. 3 of next article, insert—including 798 slaves.

RANDOLPH, a county of the Illinois (*dele* Indiana) territory, containing four townships; viz. Kaskaskia, United States' Saline, Shawanee, and the residue of Randolph county, and 12,282 inhabitants, including 168 slaves.—Also, a township of Montgomery county, in Ohio, containing 936 inhabitants.

RAPIDES. Add—This is one of the best tracts in Louisiana. No town, except Alexandria, on the right bank of the Red river, has been found, (says Mr. Darby, 1816,) in the parish of Rapides. This place is a thriving little village, and standing at the head of constant boat navigation, is of considerable commercial importance. The staples of the parish are, cotton, timber, beef, pork, and maize; and the four first being the principal.

RATE, l. 8, for Ireland *r.* India; in Ireland fix, legal interest charged by all private banks, though the interest charged by the bank of Ireland for money advanced is 5 per cent.

RATE of a Ship, &c. col. 2, l. 39, add—About ten years ago, an additional lieutenant was appointed to the line of battle ships. Ships of 50 and 38 guns have four lieutenants: l. 5 from bottom, after lieutenants, insert—ships of 20 guns, and all ships upon the establishment of sloops of war, have two lieutenants. Col. 3, l. 14, add—See SHIP.

RATE of Ships of War, add—By an order of council, the operation of which commenced Jan. 1, 1817, the following regulations were fixed with regard to rates in the navy; viz.

- 1st rate. All three deckers.
- 2d rate. All of 80 guns, and upwards, on two decks.
- 3d rate. All of 70, and under 80 guns.
- 4th rate. All of 50, and under 70 guns.
- 5th rate. All of 36, and under 50 guns.
- 6th rate. All of 24, and under 36 guns.
- 1st rate, 900, 850, and 800 men.
- 2d rate, 700 or 650 men.
- 3d rate, 650 or 600 men.
- 4th rate, 450 or 350 men.
- 5th rate, 300 or 280 men.
- 6th rate, 175, 145, or 125 men.

RAVA, in *Geography,* a town of the Persian empire, in the pachalic of Bagdad, situated between Kerkesia (the Roman *Circesium*) and Annah (the Amatho of Ammianus Marcellinus), and consisting of about 200 stone houses in the midst of extensive ruins. On the opposite side of the river are the remains of a castle, erected on the summit of a rock.

RAYUN, a town of Persia, in the province of Ker-man, which, like Tchroot and Mahim, is surrounded by numerous gardens.

READING, a township of Fairfield county, in Ohio, having 789 inhabitants.

REALIZE, r. REALISE, or REALIZE.

RED ANTIMONY-ORE. See MINERALOGY, *Addenda*.
 REDSTONE. Add—the township situated in Fayette county contains 1224 inhabitants.

REEL. See MANUFACTURE of Cotton.

REFRACTION, col. 14, l. 40, for sign *r*. fine.

REFRIGERATION. The following laws have been deduced by MM. Dulong and Petit from their experiments on the cooling of bodies. See HEAT.

1. If the cooling of a body in a vacuum surrounded by a medium whose temperature is constant could be observed, the velocity of cooling would decrease in a geometrical progression, while its temperature would decrease in an arithmetical progression.

2. When the temperature of the medium surrounding a vacuum remains constant, the velocity of cooling for excess of temperature in arithmetical progression decreases as the terms of a geometrical progression diminished by a constant number. The ratio of this geometrical progression is the same for all bodies, and is equal to 1.0077.

3. The velocity of cooling of a body in a vacuum for a constant excess of temperature increases in a geometrical progression, the temperature of the surrounding medium increasing in an arithmetical progression. The ratio of that progression is still 1.0077 for all bodies.

4. The velocity of cooling arising from the simple contact of a gas is entirely independent of the nature of the surface of a body.

5. The velocity of cooling arising from the simple contact of a fluid varies in a geometrical progression, the excess of temperature varying at the same time in a geometrical progression. If the ratio of this second progression be 2, that of the first is 2.35, whatever may be the nature of the gas or its elasticity.

This law may be also expressed by saying that the quantity of heat removed by a gas is in every case proportional to the excess of temperature of a body raised to the power of 1.233.

6. The cooling power of an elastic fluid diminishes in a geometrical progression, while the tension diminishes in a geometrical progression. If the ratio of this second progression be 2, the ratio of the first is 1.366 for air, 1.301 for hydrogen, 1.431 for carbonic acid, and 1.415 for olefiant gas.

This law may be also expressed in the following manner. The cooling power of a gas, *cæteris paribus*, is proportional to a certain power of the pressure. The exponent of that power is 0.45 for air, 0.315 for hydrogen, 0.517 for carbonic acid, and 0.501 for olefiant gas.

7. The cooling power of a gas varies with its temperature in such a manner, that if this gas can be dilated and be made to preserve the same elastic force, the cooling power will be as much lessened by the rarefaction of the gas as it is increased by the heating of it; hence the cooling power of a gas depends in a definite manner upon its tension.

REMONTOIR, col. 3, l. 15 and 23, for *r*. L. Col. 9, l. 14, for balance *r*. balance-wheel; l. 26 and 29, for *r*. l.

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RESPIRATION, col. 15, l. 21 from bottom, after inches *r*. per minute.

REVENUE. The statement of the revenue of Great Britain, for the last four years, appears in the following table.

	1815.	1816.	1817.	1818.
Customs - - -	10,487,522	8,380,721	9,761,481	9,996,226
Excise - - -	26,562,432	22,868,196	19,726,297	22,894,450
Stamps - - -	5,865,413	5,969,721	6,127,421	6,591,270
Post Office - -	1,548,000	1,426,000	1,338,000	1,339,000
Assessed Taxes -	6,214,987	5,783,322	6,127,529	6,217,594
Land Tax - - -	1,799,993	1,127,929	1,163,320	1,209,682
Miscellaneous - -	366,867	241,199	492,872	368,099
Pension, &c. - -	16	4,016	—	—
	52,125,230	45,801,104	44,946,920	48,416,321

REVOLUTION, *French*. At the close, add—On the 4th of June 1814, the king (Louis XVIII.) came to the two chambers to make a declaration of the constitutional charter; and on the occasion delivered a speech distinguished by its dignity and propriety. On the 11th of March 1815, however, Buonaparte, having escaped from Elba, landed in France, and by rapid and uninterrupted marches hastened to Paris, and resumed his power, March 22, 1815, but his fate was finally determined by the battle of Waterloo; and he made his second abdication, in favour of his son, on the 23d of June 1815; and on the 8th of the following month, the foreign troops entered the capital. Disappointed in his views of settling either in America or in England, he surrendered himself, with a suite of forty persons, to captain Maitland of the Bellerophon, July 15, 1815; and at Torbay he was transferred to the Netherland, which conveyed him to the island of St. Helena, decreed by the allied sovereigns to be the place of his future abode. Here he arrived Oct. 16, 1815.

Upon his departure from Paris, Louis XVIII. was again restored and fixed by the allied powers on the throne of France.

With respect to the events that have occurred since this article was written, such as the famous battle of Waterloo (see WATERLOO), the total defeat of Buonaparte, his deposition from the government, his removal from the capital, his confinement in the island of St. Helena, the re-establishment of Louis XVIII., the withdrawal of the allied troops, and the measures adopted for the secure and permanent sovereignty of France, under the present dynasty; they are so recent, and our limits are so restricted, that we must refer the reader to documents easy of access for a minute detail and more ample information.

REUSSITE. See MINERALOGY, *Addenda*.

RHEA, in Geography, a county of East Tennessee, containing 2504 inhabitants.

RHODE

·RHODE ISLAND. Add—See UNITED STATES.

·RHUMB, col. 2, l. 20 from the bottom, for right angles *r.* equal angles.

RICCIO, DOMENICO, called *Brufa-Sorci*, in *Biography*, an eminent painter, was born at Verona in 1494, and became a disciple of Giovanni Francesco Caroto, under whose instruction in design and colouring he laid the foundation of his subsequent celebrity. For further improvement he studied the works of Giorgione and Titian at Venice; and his proficiency was such, that his works have been generally admired and fought after, on account of the beauty of his colouring and the attitudes of his figures. Under the patronage of cardinal Gonzaga, by whom he was invited to Mantua, he became a competitor in the exercise of his art with two of the most celebrated masters of his time, Paolo Veronese and Paolo Farinato. In the church of St. George at Verona is a picture by Riccio, which represents the gathering of the manna in the wilderness, and which is accounted a fine composition, and distinguished by the force of its colouring. This matter died in 1567, at the age of 73 years.

RICE, *Chemical Composition of*. Braconnot has lately analysed this grain: according to his experiments, 100 parts consist of

	Carolina Rice.	Piedmont Rice.
Water	5.00	7.00
Starch	85.07	83.80
Parenchyma	4.80	4.80
Vegeto-animal matter	3.60	3.60
Uncrystallizable sugar	0.29	0.05
Gummy matter, approach- ing starch	0.71	0.10
Oil	0.20	0.25
Phosphate of lime	0.33	0.40
	100	100

RICHBOROUGH. The parish of Ash, in which this hamlet is situated, contained, in 1811, 334 houses, and 1685 persons; *viz.* 868 males, and 817 females.

RICHFIELD, a township of Geauga county, in Ohio, having 329 persons.

RICHLAND, l. 4, add—It contains 9027 persons, of whom 5238 were slaves in 1810. At the close, add—Also, a township of Belmont county, in Ohio, having 2831 persons.—Also, a township of Clinton county, in Ohio, having 783 inhabitants.—Also, a township of Fairfield county, in Ohio, having 881 inhabitants.—Also, a township of Guernsey county, in Ohio, having 227 inhabitants.

RICHMOND, in America, col. 2, l. 27, add—of whom 3178 were slaves in 1810; l. 54, add—of whom, in 1810, 2115 in the county, and 1321 in the town of Augusta were slaves. At the close, add—Also, a township of Kentucky, in Madison county, having 366 inhabitants, including 102 slaves.

RINSING, an operation in calico-printing, for an account of which, as well as of *damping*, see PRINTING, *Calico*.

RIO, &c. col. 2, l. 15, *r.* Helen.

RLOT, l. 20, after pillory, insert—(now abolished).

RIVERHEAD, in *Geography*, a village, or liberty, in the parish of Seven-Oaks, and county of Kent, which, in 1811, contained 184 houses, and 1012 persons; *viz.* 474 males, and 538 females.

ROAD, col. 23, l. 11 from the bottom, *r.* 1°, 13°, and 22 yards; l. 9, for 6300 *r.* 7272; l. 7, for 255,150 *l.* *r.* 294,516.

ROARING. Add—of whom 670 were slaves in 1810.

ROANE, a disease of horses, well known to jockies and dealers in these animals. It takes its name from a fin-

gular noise which the horse makes in breathing whenever he is put into a brisk motion. It usually accompanies broken wind, or at least is the forerunner of it. Mr. Ryding says, that it is owing to the extravasation of lymph, and its coagulation on the inside of the trachea, or wind-pipe, which thus obstructs respiration: and if this account of it be just, it seems to resemble the *croup* in children. The principal cause is sudden or violent and long-continued exercise. At its commencement, blistering the whole length of the wind-pipe may be of use; but when the disease continues for a length of time, it becomes incurable.

ROBERTSON, in *Geography*, a county of West Tennessee, containing 7270 inhabitants, of whom 1608 were slaves in 1810.

ROBESON, l. 3, add—of whom 1340 were slaves in 1810.

ROCKBRIDGE, l. 4, add—of whom 1724 were slaves in 1810.

ROCKCASTLE. Add—of whom 163 were slaves in 1810.

ROCK-CRYSTAL. See MINERALOGY, *Addenda*.

ROCKDALE, in *Geography*, a township of Crawford county, in Pennsylvania, having 401 inhabitants.

ROCKINGHAM, l. 17, add—of whom the slaves in 1810 were 2114; l. 23, add—of whom 1491 were slaves.

ROCKLAND, a township of Berks county, in Pennsylvania, having 1026 inhabitants.

ROMANO, GIULIO, l. 14 from bottom, for fagacious *r.* falacious.

ROME, in *Geography*, a post-town of the district of Maine, in the county of Kennebeck, with 585 inhabitants.

ROMILLY, Sir SAMUEL, *Knight*, in *Biography*, no less distinguished as a patriot and philanthropist, than for his legal knowledge and practice, has every claim which pre- eminent talents and character can give him to honourable notice in those biographical sketches which this work contains. Descended from a race of ancestors, whose attachment to civil and religious liberty constrained them to sacrifice their property, to abandon their native land, and to seek an asylum from persecution in this country, it was reserved for him to maintain and perpetuate the honour of the family from which he derived his origin. Of his family and its emigration, it will be sufficient to transcribe the following account given by himself in an address to the citizens of Bristol, when they invited him to become a candidate for representing them in parliament. "It has been published in this city that I am a foreigner, and that if you elect me, you will send a foreigner to represent you in a British parliament. Gentlemen, I was born and educated, and have passed my whole life in England, with the exception of a short interval, which was spent in visiting foreign countries. My father too was born and educated in England, and spent his whole life in it; my grandfather, it is true, was not an Englishman by birth, but he was an Englishman by choice. He was born the heir to a considerable landed estate at Montpellier, in the south of France. His ancestors had early imbibed and adopted the principles and doctrines of the reformed religion, and he had been educated himself in that religious faith. He had the misfortune to live soon after the time when the edict of Nantz, the great toleration act of the Protestants of France, was revoked by Louis XIV., and he found himself exposed to all the vexations and persecutions of a bigoted and tyrannical government, for worshipping God in the manner which he believed was most acceptable to him. He determined to free himself from this bondage; he abandoned his property, he tore himself from his connections, and sought an asylum in this land of liberty,

ROMILLY.

where he had to support himself only by his own exertions. He himself embarked in trade; he educated his sons to useful trades; and he was contented at his death to leave them, instead of his original patrimony, no other inheritance than the habits of industry he had given them; the example of his own virtuous life; an hereditary detestation of tyranny and injustice; and an ardent zeal in the cause of civil and religious freedom. To him I owe it, among other inestimable blessings, that I am an Englishman. Gentlemen, this is my origin; and I trust that I need not blush to own it."

The father of sir Samuel was an eminent jeweller, and realized a handsome fortune; his mother, whose maiden name was Garnault, was descended from a family of French refugees; and he being the youngest of nine children, of whom three only attained to maturity, was born in Frith-street, Soho, in the city of Westminster, on the 1st of March, 1757.

In early life he manifested those powers of the understanding, and those affections of the heart, which, under proper direction and assiduous culture, augured his future advancement to eminence of station and character. "He was remarkable," says one of his biographers, "for the benevolence of his disposition, his deep and generous sensibility, his high sense of honour, the quickness of his apprehension, and the extraordinary maturity of his judgment;" combining "great vivacity and a constant flow of animal spirits, with a powerful imagination, a retentive memory, and the strongest and most durable affections; he possessed a correct taste in literature and the fine arts, and retained through life a keen relish for the beauties of nature." It was his good fortune, at an early age, to form an intimacy with the Rev. Mr. Roget, a young gentleman resembling himself in taste and disposition, and afterwards his brother-in-law; to whom he was much indebted, as he himself had the modesty and gratitude to acknowledge, for giving direction to his talents, and a steady impulse to his exertions.

Thus liberally endowed by nature, and aided by the counsel of an intelligent and affectionate friend, he overcame a variety of obstacles which presented themselves in the way of his progress and advancement; and having chosen the profession of the law for the exercise of his talents, he soon exhibited those powers and that persevering application, which, without the advantages of a patrimonial estate, and an education at a public school or university, ensured his future eminence. Having enrolled his name in one of the Inns of Court, and previously acquired some notion of business in the "Six-Clerks' Office," connected with the court to which he directed his views, he was called to the bar in 1783; and from the reputation he gained as an "equity draughtsman," he soon rose to the higher departments of his profession. Upon the removal of Thurlow, Scott, and Mitford, from the chancery court, Mr. R. became a leader, and was retained in almost every cause. "His indefatigable industry, his unwearied patience, his comprehensive acuteness, his deep knowledge of the law, his correct notions of the practice of the court, were all calculated to give due weight to arguments selected with skill, propounded with modesty, and enforced by a chastened eloquence."

Raised to an independence by his own exertions, it was natural for a person of his disposition to seek a domestic establishment; and accordingly in the summer of 1797, whilst he was upon a visit at the seat of the marquess of Lansdowne, he met with a daughter of Francis Garbett, esq. of Knill-Court, in the county of Hereford; a young lady, whose youth and beauty and other amiable qualities engaged his affection, and determined his choice; and to whom he

was married in the following year. This connection opened to his views the prospect of a growing family, and of course induced him to apply to the business of his profession with additional ardour and assiduity. Accordingly when Mr. Fox and lord Grenville assumed the reins of government in the year 1806, he was nominated solicitor-general, after some suspense about committing to his custody the great seal, and received the honour of knighthood.

It is recorded to the honour of sir Samuel, as well as to that of his colleague sir Arthur Pigott, the attorney-general, that, though the press, according to the language of lord Chatham, was become, during their time, a "chartered libertine," and political contention had arrived at its height, yet with a kind of triumph over all provocations which assailed the administration of this period, no prosecution for libel occurred. Indeed, the mind of sir Samuel was occupied about a much higher object, which was the reform of the English system of jurisprudence. His first attempt with this view was an amendment of the bankrupt laws, and though he did not succeed to the extent of his wishes, so as to render the freehold estates of persons liable to the bankrupt laws, who might die indebted, assets for the payment of their simple-contract debts, for which he was allowed to bring a bill into the house of commons in 1807, which bill was lost on a division; he nevertheless obtained an act by means of which the debts of traders have been more effectually secured, for the benefit of the public. About this time he acted as a manager at the trial of the late viscount Melville, for high crimes and misdemeanors in his office as treasurer of the navy, which terminated in an acquittal. On occasion of the abolition of the slave trade, which conferred immortal honour on this short-lived administration, sir Samuel delivered a speech which made great impression on the house: and it is said that one passage of it, which he uttered with an uncommon degree of animation, was honoured by three distinct plaudits. On the dismissal of the ministry, of which he formed so distinguishing a part, he vindicated and applauded their conduct, during the year of their existence; expressing in terms of cordial approbation their decisive measures with regard to the abolition of the slave-trade, and the emancipation of Ireland, as well as their refusal to give the king a pledge not to renew the Roman Catholic question; and deprecating the return of lord Melville to office, notwithstanding his acquittal, as no one had moved for rescinding the vote against him.

The attention of sir Samuel, both in and out of office, was much occupied concerning the state of our criminal code, and the adoption of measures for reforming it. He lamented, in common with many other enlightened patriots, that the loss of life should be annexed to a greater variety of actions in England than in any other country in the world, and that criminals of very different descriptions should be subject, by the administration of our laws, to the same kind and degree of punishment. To rectify this anomaly in our jurisprudence appeared to sir Samuel Romilly to be an object of great importance, in its connection, both with the equity and humanity of legislation, and the prevention of crimes. Accordingly on the 18th of May 1808, he moved for leave to bring in a bill for the repeal of certain objectionable laws; and in this bill he introduced a clause for granting compensation to persons who were unjustly accused and tried. He soon after published a pamphlet, intitled "Observations on the Criminal Law of England, as it relates to capital Punishments, and to the Mode in which it is administered." In this pamphlet, which passed through three editions, he explained his views, and pursued his refutation of the theory of Dr. Paley. "The certainty of punishment,"

ROMILLY.

ment," says this excellent writer, "is much more efficacious than any feverity of example for the prevention of crimes. So evident is the truth of this maxim, that if it were possible that punishment, as the consequence of guilt, could be reduced to an absolute certainty, a very slight penalty would be sufficient to prevent almost every species of crime, except those which arise from sudden gusts of ungovernable passion. If the restoration of the property stolen, and only a few weeks', or even a few days' imprisonment, were the unavoidable consequence of theft, no theft would ever be committed."

Sir Samuel, having actively concurred in the abolition of the slave-trade, could not forbear expressing his indignation, when the house of commons, in the year 1814, took into consideration that article in the treaty of peace which allowed of the prosecution of the slave-trade for a period of five years, and when he found that the ministers of this country had acceded to any convention, in which this was a prominent stipulation. "If," says the biographer whose article we are citing, "the king of France has relaxed on his part, and declared the trade in human beings to be annihilated, so far as concerns his own dominions, it is to Sir Samuel Romilly, and those who supported him on this occasion, that we are to attribute the change."

The subject of this memoir soon afterwards distinguished himself by his opposition to the appointment of a new judge and tribunal for facilitating public business and alleviating the labours of the lord-chancellor. This he considered and represented as an innovation, from which neither the chancellor, nor the suitors of his court, nor the public in general, would eventually derive any advantage. In a pamphlet under the title of "Objections to the Project of creating a Vice-chancellor of England," he announced to the public his opinions on this subject, "the general result of which was, that the new division of chancery into two courts, and the creation of an intermediate court of appeal between it and the house of lords, would tend greatly to enhance the expence of suits 'already grievously and oppressively high,' to multiply the business of the court, and to protract the final decision of causes." "The remedy," he adds, "my lord, which I have to propose, is a very simple one, but I am much afraid, considering the force of several expressions which I find scattered in your lordship's pamphlet, that you will think me disrespectful even in mentioning it. You have, however, really left me no choice. You have imposed upon me the necessity of being deficient in what you will think due respect, in order to avoid the reproach of being deficient in what you have made my duty. The remedy, then, my lord, seems to be, *That the house of lords, like all inferior tribunals, should, when they are pressed with an unusual quantity of business, sit on a greater number of days and at unusual hours, in order to dispatch it.*" His last, and as some have thought his best speech, was delivered, at the close of the last parliament, against the "Alien-bill;" and so powerful were his arguments, that, on his suggestion, the amendments introduced by the lords were thrown out. In this speech, the eloquent senator details and reprobates the measures adopted and pursued by the parliament just expiring, and he closes with the following reflection: "who our successors may be I know not; but God grant that this country may never see another parliament so regardless of the liberties and rights of the people, and of the principles of general justice, as this parliament has been!" However the political opinions of persons may differ, they must concur in admiring the integrity and ardour of the speaker; and

considering it as the last speech which he ever delivered in the national senate, the perusal of it cannot be otherwise than awful and impressive.

No man ever devoted his time and talents to important and useful purposes with greater assiduity and zeal than Sir Samuel Romilly. His professional practice, which was very extensive, demanded a great portion of his time and attention; and yet whenever the public interest required his attendance in the house, he never absented himself on account of any personal engagements. His practice and his parliamentary duties occupied the whole of the day from the morning dawn frequently till midnight; and his publications were the productions of those hours that ought to have been devoted to rest and sleep. It is not at all surprising that talents like his, and so employed, should command general notice and respect. In a former parliament many enlightened and respectable members of the city of Bristol directed their views to him, and wished for such a representative; but other interests prevailed against his abilities and character, and the influence of his friends. At the last general election, he was proposed as a fit representative for Westminster, his native city; and he was chosen in the most honourable manner, without trouble, expence, and solicitation, by a decided majority, and amidst the applauses of an immense body of electors. But a circumstance occurred which rendered the closing period of his life gloomy and distressing, and which disappointed the expectations of his constituents. Lady Romilly, to whom he was affectionately attached, and with whom he had enjoyed a high degree of conjugal felicity, had been for some time in a state of declining health, and his mind was agitated by very distressing and depressing apprehensions on her account. During their residence at their country-house at Tanhurst, in Surry, in August 1818, her complaint seems to have abated, and with the flattering hope that her convalescence would be confirmed by the mild air of the Isle of Wight, they accepted an invitation from Mr. and Mrs. Nash, to spend the remainder of the vacation at their hospitable castle at East Cowes, whither they removed in the month of September. Here Lady Romilly's disorder recurred with circumstances of peculiar aggravation; and Dr. Roget, the nephew of Sir Samuel, was summoned to her relief. Her complaint, however, was irremediable; and after various fluctuations, which excited alternate hope and alarm, she died of a dropsy in the chest, in the night of the 29th of October. During the progress of her disorder to its fatal termination, Sir Samuel's mind was kept in a state of constant suspense and anxiety, until at length his sympathy with the amiable sufferer and an apprehension of the uncertain issue of her complaint, disordered his whole frame, deprived him of sleep or feared him with frightful dreams; and it is said, that on one occasion, after having been in a state of great distress, he intimated to a friend, that he felt a burning sensation in his head; and this seems to have been the only occasion on which he made a complaint of this kind. Alarmed about himself, he sought relief, and tried a variety of medicines without any permanent effect. "He frequently expressed his surprize, that his want of sleep did not interfere with his bodily health, that his appetite and digestion continued in full vigour, that no indication of fever existed, and that he felt no uneasy sensation in his head. In conversing with Dr. Roget and Mr. Dumont he dwelt much on this apparent anomaly, and drew from it the most ominous preface, as to the probability of its ending in infamy—an apprehension which unfortunately took deep root in his mind. Although in all other respects he was perfectly in possession of his faculties, yet on this subject his imagination

tion was certainly disordered, and we may trace, in the intensity of this dread, the incipient stage of mental derangement. A striking instance of this feeling appears in one of the testamentary papers written by him about this time, in which he gave particular directions as to the management of his property, the care of his children, and the custody of his person and estate, in the event of his becoming a lunatic. It may be remarked also, that the circumstance of his losing fight, in a great measure, of the primary cause of his grief, and of fixing his attention so much upon his own feelings, was so opposite to his natural disposition, as in itself to constitute a strong feature of aberration." Other circumstances, which occurred on his interviews with his friends, confirm the same observation.

On the morning after lady Romilly's death, when Dr. Roget informed him of the event, he received the intelligence with calmness and resignation, and without any effusion of grief; and prepared to quit the scene of his sorrows at the suggestion of his friends without hesitation or demur. At Murrel-green, where they lodged in their way to London, we learn from Dr. Roget, who passed the night in the same room with him, that, although he was in general restless, yet, at intervals, he enjoyed tranquil sleep; nor did he betray, at any period, the smallest sign of impatience or irritability. As he approached London, however, on the following day, his agitation increased, and he once complained to his daughter that his head was disturbed. After his arrival at his own house in town, he ate his dinner with his usual appetite; he then sent for Dr. Marcet, who inquired particularly concerning the state of his head, and was informed by sir Samuel, "that he had no head-ache, nor any uneasy sensation whatever in his head." "The symptoms present were those of a high degree of nervous irritation, unaccompanied by fever or any inflammatory action; but they were of a nature to excite considerable alarm as to the state of his mind. Though he refrained from giving vent to his feelings, it was evident, from his manner and from the expressions which dropped from him, that he despaired of his recovery, in spite of every endeavour to inspire him with hope and comfort." To the use of all means that were recommended for allaying his extreme irritation he objected; alleging, "that he must necessarily pass a wretched night, and that if he were to use any medical prescription, it would only have the effect of taking away all his confidence in the powers of medicine."

During the greatest part of the night, Dr. Roget, who slept in the same room, reports that he was perfectly tranquil and apparently asleep; though in the morning sir Samuel assured him, that he had never, for an instant, dropped asleep.

The next morning the restlessness returned, and was attended with symptoms of fever; and the tongue became white during the night, and the pulse at one time rose to 130 in a minute. Upon consulting Dr. Marcet, it was proposed, at his suggestion, to apply ice to the head, and to have recourse to cupping; but before these measures were adopted, Dr. Babington was sent for, and before he arrived the excitement had subsided, and sir Samuel was much relieved by a copious perspiration. Upon consultation it was agreed, that the measures proposed by Dr. Marcet, in existing circumstances, would not be expedient; and other medicines of an active nature were prescribed. These were taken by sir Samuel without reluctance; and he continued tranquil and apparently asleep till about two o'clock. His daughter remained at the side of his bed, who observed upon his awaking, that he became restless and

agitated. Upon being asked whether Dr. Roget should be called, he replied in the negative; but upon a second inquiry, he faintly assented. During the short interval of Miss Romilly's absence, a sudden paroxysm had seized him, hurried him from the bed, and armed his hand against his own life. The razor with which he had inflicted the fatal wound was in his hand when Dr. Roget entered his apartment. Before he expired, as his biographer proceeds in the relation of the melancholy catastrophe, he made signs that he wished to write, but though supplied with pen and ink, nothing intelligible could be collected from his attempts. He then desisted from making them, and joining his hands, appeared, from the movements of his lips and eyes, to be absorbed in fervent prayer. It is hardly necessary to state, that the jury summoned on the coroner's inquest brought in a verdict, "that the deceased had destroyed himself in a state of temporary mental derangement."

Sir Samuel and his lady were interred at the same time, in the same grave, at Knill, the seat of her ancestors, in Herefordshire. The funeral, agreeably to the instructions of his will, was private; being attended only by his nearest relations and most intimate friends. Six sons and one daughter survived to lament the irreparable loss which they sustained. The calamitous event, which thus awfully terminated the life of sir Samuel Romilly on the 2d of November, 1818, in the 62d year of his age, made a deep impression, not only in the circle of his family and friends, but through the country in general. So highly was he respected and esteemed, that, on this melancholy occasion, "the solicitors suspended their practice; the counsel abandoned the courts; while the judge forsook the bench, after he had shed a torrent of tears!" The following singular circumstance is mentioned by his biographer, viz. that in the parish church of St. Bride, Fleet-street, there is a simple undecorated tablet placed against the wall, with an inscription on it to the memory of Mr. Isaac Romilly, F.R.S., who was the uncle of sir Samuel, and who died in 1759 of a broken heart, seven days after the decease of a beloved wife. For the materials and authentic documents that have furnished this article, we refer to the "Annual Biography and Obituary for the Year 1819," vol. iii.

RÖMNEY, in *Geography*, a town of Grafton county, in New Hampshire, containing 765 inhabitants.

ROOFS, in *Rural Economy*. Add—Roofs of iron have lately been introduced with advantage. Mr. T. Pearfall of Bath has constructed several in the neighbourhood of Bristol and London: and on a comparison of a roof of this kind with that of timber, he observes, that the iron-roof is fixed on the walls *complete* for the covering; that the strength and durability of the iron must be allowed to be superior to those of wood; and that the prevention of fire should not be forgotten. By his statement, the whole expense of such a roof, erected over a brick-kiln near Bristol, 20 feet 3 inches in length, and 18 feet 6 inches in span, appears to have been 18*l.* 6*s.* 11*d.*

ROSAMOND, col. 2, l. 17, *r.* if it cannot be, &c.

ROSS, in Ohio, l. 1, *r.* 16. Add—Also, a township of Butler county, in Ohio, having 1321 inhabitants.

ROSSO of Florence, in *Biography*, called by the French *Maitre Roux*, was born in 1496, and without regular tuition arrived at a considerable degree of eminence in the art of painting. The works of Michael Angelo were his favourite studies, whose style he endeavoured to imitate without fervently following it. Hurried away by a lively imagination and great command of the pencil, he could not attach himself to the study of nature, or the antique, so steadily as he ought; hence, though his works exhibit great brilliancy of invention,

invention, grandeur in their masses, gaiety of colour, and taste in the management of the draperies, they are frequently wild and extravagant in composition and effect.

He exhibited his talents early in life, and painted when very young a large picture of the Assumption of the Virgin for the church of La Nunciata at Florence, which was distinguished by the novelty and intrepidity of its style. He painted several other pictures there, and then went to Rome, where reputation had already forerun him. In that city, he painted an altar-piece for S. Maria della Pace, and the Decollation of St. John for the church of St. Salvati. He remained there till it was sacked in 1527, and then fled to Votterra, where he painted a fine picture for the oratorio of St. Carlo. He went afterwards to Venice, and there painted for Aretin his celebrated picture of Mars and Venus; but not being sufficiently employed in Italy, he accepted an invitation from Francis I. of France, who then emulated the character of an encourager of art and science. By this munificent monarch, Rosso was employed both as an architect and painter, and the building and decoration of the palace of Fontainebleau were intrusted to his care, and he was gratified with a handsome pension, and lived in affluence and esteem, as he was not only an able artist, but a man of literary acquirements, and of polished and agreeable manners.

The unhappy termination of the life of Rosso affords a lesson to those whose minds are inclined to indulge suspicious sensations. He had lived in friendship with one Francesco Pellegrini, a Florentine painter, who was in the habit of visiting him occasionally. Soon after one of his visits Rosso's house was robbed of a considerable sum, and he rashly suspected Pellegrini to be the thief. He accused and prosecuted him, but he having endured examination and the torture, to which he was cruelly put to extort confession without any sign of guilt, was declared innocent. As soon as he was released, the unfortunate Florentine published a just and severe statement of his case, and appealed for justice; to this Rosso had nothing to plead, and to avoid the infamy and remorse to which the injustice he had been guilty of must necessarily subject him, he put an end to his existence by poison in 1541, at the age of 45. The greater part of his paintings at Fontainebleau was destroyed by his rival and successor Primaticcio, to make room for his own productions.

ROSS-SHIRE, col. 2, l. 2, for 13,280 r. 12,829; and after inhabitants, add—viz. 27,640 males, and 33,213 females: 7490 families being employed in agriculture, and 2499 in trade, manufactures, and handicraft.

ROSTRATA. See WHALE.

ROT, DRY, l. 2, add—See BOLETUS. Col. 7, at the close, add—Mr. Robert McWilliam, in a valuable "Essay on the Origin and Operation of the Dry-Rot, with a View to its Prevention or Cure; to which are annexed, Suggestions on the Cultivation of Forest-Trees, and an Abstract of the several Forest Laws, from the Reign of Canute to the present Time," 4to. 1818, has demonstratively shewn, that the common practice of felling oak in the spring is an error which ought to be avoided; and that the seasoning of timber is not less important as a means of preventing this disease. This ingenious author considers fungi as a proximate cause of the dry-rot; and as to the origin of fungus, he knows of no sound argument against its having been created, like other vegetables, at the beginning of all things. After many investigations and researches, the cause of vitality has not been satisfactorily ascertained. Dr. Darwin, in his Speculations on the Origin of Microscopic Beings, adopted the incomprehensible doctrine, that their vitality is spontaneous. Buffon, Reaumur, Priestley, Ellis, Ingen-

houz, and many others, have been bewildered in their conjectures and hypotheses respecting this subject. After all, whether the parents of microscopic beings, animal and vegetable, exist universally and invisibly in the atmosphere, according to Dr. Priestley's theory; or whether their vitality be spontaneous, according to the hypothesis of Dr. Darwin, we must admit the fact, that nature suffers no fit recipient for animal or vegetable life to remain void; that microscopic beings of both kingdoms are always ready to seize on every thing which can afford them subsistence; and that fungi find an appropriate nidus in diseased and decayed vegetable matter, more particularly if it continues in a state of moisture and warmth; whence the wood-work and walls of vaults are usually covered with mouldiness or mucor. It has been maintained by writers on this subject, as well as by our author, that fermentation always takes place in the vegetable matter destroyed, previously to the appearance of the fungus; but as all sap-wood, whenever felled and employed either in a green or seasoned state, contains a greater or smaller quantity of saccharine matter, this matter, under certain degrees of continued warmth and moisture, is disposed to run into fermentation. In the process of putrefaction, carbonic acid gas and hydrogen gas are evolved in great abundance; and as carbon and hydrogen are essential constituents in the pabulum of plants (whatever may be the origin of their vitality), we thus obtain some knowledge of their mode of support. To deprive these noxious fungi of the means of subsistence is the great desideratum in the prevention or cure of the dry-rot. Of the fungi which attach themselves to buildings, Mr. McWilliam enumerates the following; viz. mucor or mould, boletus lachrymans, agaricus coriaceus, A. domelticus, and an agaricus resembling Mr. Sowerby's A. bulbosus. These fungi are easily propagated either by seed or root; the latter shooting in various directions will lay hold of timber, and penetrate into its fissures or crevices. In preparing cement for buildings, these vegetable substances should be carefully excluded; as they are sometimes brought with the scrapings of public roads, sometimes in the water from stagnant pools, which contain myriads of seeds that are capable of germination, and only require a favourable temperature to start into life; and whoever considers the facility with which fungi are generated, it seems surprising that any building should be exempt from the ravages of the dry-rot, rather than that some should be attacked by it. Warmth, moisture, and air, are necessary to the germination and support of fungi; but a redundancy of any of the three, according to the present author, will destroy the equilibrium on which their action depends, and the dry-rot will cease till that is restored, when the disease resumes its activity. The range of temperature within the limits of which fungi will vegetate is prodigious. The dry-rot will proceed rapidly at 80°, as is evident from the circumstance of ships returning from tropical climates, almost covered with fungi; at 90°, 100°, 110°, its progress becomes more and more slow, and at 120° it will in general be arrested; but Mr. McWilliam thinks, that no degree of heat short of combustion will destroy, though it may suspend, its corrupting influence. In descending the scale of the thermometer, it is found that the dry-rot proceeds very fast at 50°, more slowly at 40°, and is only suspended at 32°: for no degree of cold with which we are acquainted will destroy the corrupting principle, and prevent its return after the temperature has been raised to 45° or 50°. Hence it is obvious, that the application of mere local and artificial heat can be of little or no avail. The great remedy, or preventive, on which Mr. McWilliam principally relies is, in accordance with the general theory, the free circulation

culatation of atmofpheric air, and the application of heat may be ufeul as an auxiliary in promoting fuch a circulation. He obferves, that even atmofpheric air itfelf muft be applied with fome difcretion: for if in its paffage through any part of a building which is damp and already affected it fhould become impregnated with noxious gases, and be charged with any of the volatile feeds of fungi, it may do more harm than good. It is neceffary, therefore, *in limine*, to remove the infected materials, the difcovery of which requires a penetrating eye.

Water is likewife a powerful agent in preventing and remedying the ravages of the rot; and many inftances have occurred that prove the antifeptic properties of water acting on wood entirely fubmerged in it. But when water is applied as a fubftitute for air in cellars, vaults, &c. care muft be taken that it does not ftagnate, but flow regularly through the drains; in which cafe it will carry off with it much of the carbonic acid gas, which is fo eflential a pabulum to fungi.

The charring of timber is of very ancient ufe, and againft external infection is an admirable prefervative; but when the principles of decomposition are within, it is of very little advantage in refifting them. Paint, when the timber is properly feafoned and dry, is likewife very beneficial. For other interefting particulars relating to this fubject, we muft refer to the author's Eflay.

ROVING. See MANUFACTURE of Cotton.

ROUM. For KALA *r.* KELEA.

ROWEN. Add—of whom 3757 were flaves in 1810.

ROXBURGHSHIRE, l. 23, for 6518 *r.* 6423; after inhabitants, add—*viz.* 17,113 males, and 20,117 females: 3763 families being employed in agriculture, and 2487 in trade, manufactures, or handicraft.

RUBY, SPINEL. See MINERALOGY, *Addenda*.

RUDGELEY. In 1811, the parifh contained 453

houfes, and 2213 perfons; *viz.* 1089 males, and 1124 females: 101 families being employed in agriculture, and 277 in trade, manufactures, and handicraft.

RUMFORD, l. 1, for Cumberland *r.* Oxford. Add—It has 629 inhabitants.

RUSCOMB MANOR, a township of Berks county, in Pennsylvania, having 932 inhabitants.

RUTHERFORD. Add—of whom 979 were flaves in 1810. Add—Alfo, a county of Weft Tennessee, having 10,265 inhabitants, of whom 2701 were flaves in 1810.

RUTILE. See MINERALOGY, *Addenda*.

RUTLAND, in America, l. 7, *r.* 17 townfhips.

RYE, *Chemical Compofition of.* This grain has been analysed by Einhoff; according to whom 100 parts of good rye-meal confift of

Albumen	-	-	-	3.27
Gluten not dried	-	-	-	9.48
Mucilage	-	-	-	11.09
Starch	-	-	-	61.09
Saccharine matter	-	-	-	3.27
Hulk	-	-	-	6.38
Lofs	-	-	-	5.42
				100

According to the fame chemift, 100 parts of good rye-feed yield

Hulk	-	-	-	24.21
Moifture	-	-	-	10.15
Pure meal	-	-	-	65.64
				100

S.

SABINE, in *Geography*, a river of Louifiana, being a temporary boundary between the United States and the Spanifh internal provinces, and part of the permanent weftern limits of the itate of Louifiana. This river difcharges itfelf into the gulf of Mexico, in N. lat. 29° 23' and W. long. 93° 57', or 10° 57' W. from Wafhington city. The depth of water at its mouth is not more than four feet on the bar in ordinary tides. This river about 12 miles from its mouth expands into a wide fhallow lake, 10 or 12 miles wide and 25 long, with a bearing N.E. and S.W. At the extremity of this lake, it receives both the Sabine and Netchez. A line of fea-fhell banks is formed along the fhore of the lake between the two rivers, and on

the point on the left fhore of the Sabine, an increafed mount of thefe fhells is found, covered with dwarf trees. About 15 or 20 miles above the lake, wood presents itfelf in larger bodies, and the wood rifes by a flow gradation; and as we advance the woods inclofe the river on both banks, the ftream becoming contracted to the width of 150 yards, and fo continuing with little variation as high as the Alabama villages, where it thrieks to 70 or 80 yards in breadth, and it preferves this breadth to N. lat. 32°. The fource of the Sabine has not yet been precifely afcertained; nor have any fettlements of civilized people, a fingle family excepted, been yet made on the Sabine. The weftern branch of the Sabine is called *Netchez*; which fee.

SACLACTIC ACID, in *Chemiftry*. This acid has been recently analysed both by Gay Luffac and Thenard, and by

by Berzelius. According to these chemists, it is composed of

	Gay Lussac and Thenard.	Berzelius.
Hydrogen	- - 3.62	- 5.105
Carbon	- - 33.69	- 33.430
Oxygen	- - 62.69	- 61.465
	<hr/> 100	<hr/> 100

Which coincide nearly with 5 atoms hydrogen + 6 atoms carbon + 8 atoms oxygen; according to which, the weight of its atom will be 131.25.

SACO, in *Geography*, a town of Maine, in the county of York, having 2492 inhabitants.

SADDLE RIVER. Add—Alfo, a township, containing 2174 inhabitants.

SADSBURY. Add—Alfo, a township of Lancaster county, in Pennsylvania, having 843 inhabitants.—Alfo, a township in Crawford county, in the same state, having 540 inhabitants.

SAHLITE. See SAHLITE, and MINERALOGY, *Addenda*.
SAL SEDATIVUS, &c. add—after *Sedative* SALTS, under SALTS.

SALEM, l. 9, add—This county contains nine townships, and 12,761 inhabitants, including 29 slaves in 1810; l. 24, r. 12,693; l. 52, for two r. three; l. 54, add—and a third in Mercer county, having 470 inhabitants.

SALEM, *New*, a town of Hampshire county, in Massachusetts, containing 2107 inhabitants.

SALEM, *Well*, a township of Mercer county, in Pennsylvania, having 660 inhabitants. Col. 2, l. 5, add—SALEM, in Belmont county, Ohio, contains 374.—SALEM, in Champlain county, 1021.—SALEM, in Columbiana county, 839.—SALEM, in Jefferson county, 912.—SALEM, in Tuscarawara county, 442.—SALEM, in Geauga county, 334.—SALEM, in Washington county, 248 inhabitants.

SALFORD. Add—the upper contains 838, and the lower 558 inhabitants.

SALINE, a township of Gallia county, in Ohio, having 262 inhabitants.

SALINES. Add—This town appears from the entrance into Salines bay covered with that white fog, so much dreaded, and so well known in Italy by the name of *mal-aria*. Whenever this phenomenon occurs, the heat upon the island is excessive. Salines, and the towns situated on the E. and N.E. coasts of the island, are subject to such dangerous temperature, that in the months of June and July, persons fall victims to the afflicting malady called by the French Coup de Soleil (a sun-stroke), if they venture out at noon without an umbrella. The great heat experienced upon the eastern coasts of Cyprus is owing to two causes: to the situation of the island with respect to the Syrian, Arabian, and Lybian deserts; and to its mountainous nature, preventing the cooler winds, the west and north-west, from the low shores to the east and north-east. See CYPRUS.

SALSBURY, a township of Gallia county, in Ohio, containing 460 inhabitants.

SALIVA, *Chemical Composition of*. According to the experiments of Berzelius, 1000 parts of human saliva consist of

Water	- - -	992.9
Peculiar animal matter	- - -	2.9
Mucus	- - -	1.4
Alkaline muriates	- - -	1.7
Lactate of soda and animal matter	- - -	.9
Pure soda	- - -	.2
	<hr/> 1000	

The peculiar animal matter is soluble in water, insoluble in alcohol, and is precipitated by subacetate of lead. Hence it appears to be a species of mucus. What Berzelius has termed *mucus*, Dr. Boistock and Dr. Thomson appear to consider as coagulated albumen.

SALMO ALPINUS. Dr. Shaw suggests, that this is the gilt charr of Pennant, and the next species or Salvelinus is his red charr. TAIMEN, l. *penult.* r. 3½ feet. KUNDSCHA, l. 3, r. 2 or 3. LAVARETUS, add—See GWINIAD. Dr. Shaw supposed that the gwiniaid of Pennant is the S. WARTMANNI; r. LEUCICTIYS. EBENTULUS, or toothless, silvery-olive, salmon, with compressed yellow head, lanceolate red fins, and forked tail: a native of Surinam, where it is highly esteemed as food; r. ANASTOMUS.

SALT, col. 3, l. 31, r. *fibvery* for *fibbery*. Col. 4, l. 7, r. *fibvery* for *fibbery*.

SALT, *Laws relating to*, col. 7, l. 20, add—Mr. Parkes informs us, that he has made inquiry of one of the most considerable falt-importers, who informs him, that they pay only 5s. 8d. city-duty on the cargo, whether it be five tons or fifty tons of the falt imported.

SALTS, *Supertartrate of Potash*, l. 8, inferit—See TARTRATE.

SALTS, in *Chemistry*. It may be proper to observe here, that a large proportion of the numbers representing the weights of the atoms of bodies given under our article SALTS in the Cyclopædia require correction; for which purpose we refer our readers to the tables appended to *Atomic Theory*, and to the different articles in the *Addenda*, where they will find the most recent determinations.

SALT Creek, in *Geography*, a township of Muskingum county, in Ohio, containing 389 inhabitants.—Alfo, a township of Pickaway county, in Ohio, containing 810 inhabitants.

SALT-Lick Town, l. 1, add—in the county of Berkshire-vania, having 994 inhabitants.

SAMI, col. 2, l. 24 from bottom, for *friction* r. *friction*.

SANBORNTOWN, l. 2, r. *Strafford*.

SANDERSFIELD, a town of Berkshire county, in Massachusetts, containing 1648 inhabitants.

SANDHURST, near Bagshot, in Hampshire.—The royal military college, part of which is now established at Sandhurst, consists of a *senior* and *junior* department. The *senior* department was established at High Wycombe, in the year 1799, (but has recently been removed to Farnham, in Surrey) for the purpose of instructing officers in the scientific parts of their profession, with a view of enabling them better to discharge their duty when acting in the command of their regiments, and at the same time qualify them for being employed in the quarter-master and adjutant-general's department.

No officer can be admitted into this department until he has completed the twenty-first year of his age, and actually served with his regiment as a commissioned officer for three years abroad, or four years at home. Applications for admission must be made to the governor through the colonel or commanding officer of the regiment to which the individual belongs. Every candidate, previous to admission, must undergo such examination as may be deemed requisite.

The students pay into the funds of the college such sum annually as is determined by the supreme board of commissioners. The present subscription is thirty guineas *per annum*. They are subject to the rules and discipline of the army, as if serving with their regiments.

The studies pursued at this department are as follows:—Mathematics in all its branches; fortification; gunnery; castrametation; military drawing and surveying; the recon-

noiring of ground; the disposition and movement of troops under all the various circumstances of offensive and defensive war; rules for estimating the military resources of a country; and the German and French languages.

There are six professors in this department, *viz.* one mathematics, &c.; one fortification; two military drawing; one French; one German.

Public examinations on points of science are held half yearly, in preference of the collegiate board, upon which occasion one or more members of the supreme board, not being members of the collegiate board, attend. Those officers who have gone through the regular course of studies, and have passed that examination by which they may be duly qualified for staff appointments, receive certificates thereof, signed by the board, and sealed with the seal of the college.

The junior department was first established at Great Marlow in 1802, (but has recently been removed to Sandhurst, near Bagshot,) to afford a provision for the sons of officers who have fallen, or been disabled, in the service of their country; and the means of education to the sons of those officers who belong to any regular regiments. It consists of four companies, of 103 cadets each. They are admitted upon three different establishments, *viz.*

1st. Orphan sons of officers who have fallen or been disabled in the service, are admitted free of expence, except in bringing the first suit of uniform on their admission, and keeping up their stock of linen during their residence at the college: They are provided with board, clothing, and education, by the establishment, free of charge.

2d. The sons of officers actually serving in regular regiments of the line, who pay a certain sum *per annum* (from 10*l.* to 60*l.*) according to the rank of their fathers.

3d. The sons of noblemen and gentlemen, who pay 100*l.* *per annum* each.

Applications for admission must be addressed to the governor. — Every candidate previous to admission must pass an examination in Latin and English grammar, and the first four rules of arithmetic. No candidate can be admitted who is under thirteen years of age, or above fifteen.

There are examinations held monthly, which are conducted by the professors of the senior department, to ascertain the progress of each cadet, previous to his removal from one class to another. There are also public half yearly examinations upon the same principle as those at the senior department, previous to the cadets receiving commissions from the college; and, according to their proficiency in the course of studies, they have certificates of qualifications to serve in the army as officers, granted to them by the board of commissioners, in whose presence the examination takes place.

The studies pursued at this department are as follows: — Mathematics; fortification; military drawing; landscape drawing; history, geography, and classics; French; German; and fencing.

There are seven masters of mathematics; four of fortification; five of military drawing; three of landscape drawing; four of history, geography, and classics; six of French; one of German; three of fencing.

Gentlemen cadets are allowed to purchase commissions at any time during their continuance at the college; but no gentleman cadet can be recommended for a commission by private interest until he has made a certain progress in his studies. See WOOLWICH and HIGH WYCOMB.

SANDISTON, a town of Essex county, in New Jersey, having 703 inhabitants.

SAND-STONE, l. 10, *r.* to be visible. In other sandstones, the grains, &c.

SANDY CREEK. Add—Also, a township of Mercer county, in Pennsylvania, containing 327 inhabitants.

SANDY Lake, a township of Mercer county, in Pennsylvania, having 403 inhabitants.

SANGUISORBA. Add after *S. officinalis*—Mr. Parkes, in his "Chemical Essays," (vol. v. p. 12.) informs us, on the authority of a tanner, that there is more of the tanning principle in the plant called burnet than in oak-bark. His informant suggested, that it might be cultivated for cattle, which (he says) are fond of it, and ploughed up every three years in order to collect together the root for the purpose of tanning.

SANSANDING. Add—Sansanding is called Badoo, and in Park's last mission to Africa is represented as a small town, consisting of 300 huts; another Badoo, N. of this, is called *Sanjanba*. Sansanding is said to contain 11,000 inhabitants; it has no public buildings, except the mosques, two of which, though built of mud, are not inelegant. The market-place is a large square, stored with articles of merchandize, and crowded with people. Some of the stalls contain nothing but seeds; others, indigo in balls; others, wood-ashes in balls; others, Houffa and Jinnie cloth. Here are also, antimony, sulphur, copper and silver rings and bracelets, amber, silks from Morocco, tobacco and salt, yellow leather, &c. &c. Park's Last Mission to Africa, p. 216.

SAP, *Chemical Composition of*. Add—Dr. Prout has examined the sap of the common vine. He found its sp. gr. did not differ from that of common water. It did not affect litmus paper, and contained so little of solid matter, that 2300 parts of it evaporated to dryness left only one part of residuum, of which about half was carbonate of lime, and the rest a peculiar vegetable matter insoluble in alcohol, with traces of an alkali.

SAPHIES, an African term which denotes certain charms or amulets, which the negroes constantly wear about them. These saphies are prayers, or rather sentences from the Koran, which the Mahometan priests write on scraps of paper, and sell to the simple natives, who regard them as possessing very extraordinary virtues. Some of the negroes wear them to guard themselves against the bite of snakes or alligators; and in this case, the saphie is commonly inclosed in a snake's or alligator's skin, and tied round the ankle. Others have recourse to them in time of war, to protect their persons against hostile weapons; but the common use to which these amulets are applied is to prevent or cure bodily diseases; to preserve from hunger and thirst, and generally to conciliate the favour of superior powers under all the circumstances and occurrences of life.

Similar charms or amulets are common in all parts of Africa, under the different denominations of *domini*, *grigri*, *fetiche*, &c. &c.

SAPPHIRE. See MINERALOGY, *Addenda*.

SARASWATI, col. 2, l. 23 from bottom, for creature *r.* creative. Col. 3, l. 8, for Jayatri *r.* Gayatri. Col. 5, l. 11 from bottom, for painted *r.* pointed.

SARATOGA, l. ult. *r.* in 1810; add—of whom 107 were slaves.

SARKFOOT. Add—In 1811 the parish of Graintrey contained 333 houses, and 1749 persons; *viz.* 797 males, and 952 females.

SAROS, l. 4, add—Berofus used this period, and also *Neros* and *Sofos* (which see), in chronological calculations, and fixing the epochs of his history of Babylon. Ancient authors, however, are not agreed as to the number of years contained

contained in the Saros. Syncellus, after Berofus, Abydenus, Alexander Polyhitor, &c. affirm, that it was a period of 3600 years, which is by no means probable. Dr. Halley agrees with Suidas in identifying the faros with the period of 223 (not 222 of Suidas) synodic lunar months mentioned by Pliny, which amount to nearly eighteen of our years; a period which furnishes an easy method of predicting eclipses within the limits of the error of only half an hour; and the formation of this cycle evinces the skill of the Chaldeans in astronomical computation.

SAVANNAH, 1. *penult.* insert—the slaves in the county being 7557, and in the town 2195.

SAUCON, *Lower and Upper*, two townships of Northumberland county, in Pennsylvania, the former containing 1074, and the latter 1456 inhabitants.

SAVING-BANKS, or *Banks for Savings*, are institutions which, under this appellation, are of recent origin, and which have been established for the purpose of ameliorating the condition of the lower classes of mankind. Many schemes, of various denominations, have been propoed with a view partly, or wholly, to this object. One of the most ancient of this kind is the institution of male *Friendly Societies*, which was established about a century ago, and which, to a certain extent, counteracted the pressure of poor-rates, and the growth of those baneful habits of dependence which poor-rates are adapted to produce. (See *FRIENDLY Societies*.) These societies, though they partake of the nature of insurances on life and property, by promising certain advantages in the event of certain casualties or contingencies, are, however, preferable to common insurance offices, inasmuch as the members insure each other, and retain all the profits in their own hands for the general advantage. In these societies, there is also a benevolent principle that influences those who form them, and induces them to feel and express a solicitude for each other's welfare. Nevertheless, the benefits derived from them by individual members are often distant, and in their nature uncertain; so that those who have regularly contributed to them for forty or fifty years have not received a shilling from their funds. In the year 1772, baron Maseres published "A Proposal for establishing Life Annuities in Parishes, with a View to the Benefit of the Industrious Poor;" and this was accompanied with the suggestions of some alterations by the Rev. Dr. Price. The ingenious baron recommended to the nation, to obtain a law for enabling the parish-officers in England to grant, upon purchase, to the labouring inhabitants life-annuities, payable out of the parish-rates. The plan was approved by persons of the most distinguished character at that period, and a bill was brought into the house of commons by Mr. Dowdswell, under the auspices of Mr. Burke, sir George Savile, Lord John Cavendish, Mr. Dunning, Mr. Thomas Townshend, and others, for carrying it into effect. The bill was passed, but it miscarried in the house of lords at the second reading. However desirable and excellent this plan might appear in theory, it was not likely to prove effectual; because, for the purchase of the proposed annuities, a sum of money, of great amount to the purchaser, was demanded at once; and it was out of his power to procure it. A scheme somewhat resembling that of a saving-bank was published in 1797 by Mr. Bentham, in Young's "Annals of Agriculture." One part of his plan comprehended an institution which he denominated "A Frugality-Bank." Into this bank he proposed to receive the deposits of the poor, not for the mere purpose of yielding an interest, and being withdrawn when wanted, but to form or purchase an annuity for old age, when

the ability for earning would be destroyed or impaired. He suggested, however, that this superannuation annuity should, either wholly or in part, be converted into any other species of benefit adapted to the exigencies of the owner. *E. gr.* It might be changed into an annuity for an exiting wife, in the event of widowhood, or into an annuity during the nonage of a certain number of children; or it might serve as a pledge for money borrowed; or part of it might be fold for raising a marriage-fund; or it might be simply withdrawn. As no attempt was made for the accomplishment of Mr. Bentham's plan of a frugality-bank, it remained without effect. It is needless to mention, or to detail, the various particulars of a plan submitted to the public by Mr. Bone in the years 1805 and 1806; as it comprehends a great number of objects which lay beyond the attainment of the poor.

It was still a matter of regret that, notwithstanding various schemes that had been suggested, no plan had been devised for securing to the labouring classes a place of safe deposit for the fruits of their industry, so as to encourage them to save, in the years of active exertion, such a portion of their gains as they might be able to spare from their present necessities, so that they might have a resource in the season of misfortune, or in the decline of life; and more especially to afford them the advantage of receiving regular interest for their small savings, on a scale advancing to a certain extent, in proportion to the amount and continuance of their deposits. Of the first establishment of an institution that may properly be called a saving-bank, we have an account in N^o 84. of "The Reports of the Society for bettering the Condition of the Poor." From this report it appears, that a female benefit-club was established on the 22d of October, 1798, at Tottenham, near London, under the patronage of a number of ladies. This institution comprehended within its general design and plan two other objects, *viz.* a fund for loans to prevent the use of pawnbrokers' shops, and a "bank for the earnings of poor children." "Children of either sex," says Mrs. Priscilla Wakefield, an ingenious and benevolent lady, whose pen was employed in the instruction of the public, and whose heart was actuated by a generous concern for benefiting those by whom she was surrounded, "or of whatever age, whether belonging to a member or not, are permitted to bring any sum above a penny to the monthly meeting of the stewardefses, to be laid up in the funds of the society; where their small earnings may accumulate in security, until wanted for an apprentice-fee, clothing, or going to service, or some other important purpose." It is added, "although the children receive no addition to the pittance they deposit in the fund, yet it answers several purposes; it stimulates them to earn and to save that which would probably be idly spent, as of too small importance for care; it often encourages their parents to lay by a little store for them, which they would not have thought of doing, had they not been invited by this opportunity of placing it in safety. It habituates the children to industry, frugality, and foresight; and by introducing them to notice, it teaches them the value of character, and of the esteem of those who, by the dispensations of Providence, are placed above them; and in many instances, it may supply a resource when it is essentially requisite. The success has already exceeded expectation; above sixty children bring their little treasure monthly." The success of this children's-bank gave rise to a more extensive plan in the same place in 1804, called "The Charitable or Benefit Bank." This was begun for the express purpose of providing a safe and profitable place of deposit for the savings of labourers,

SAVING BANKS.

labourers, servants, &c., and opened once a month for receipts and payments. The books were at first kept by a lady; six wealthy individuals were appointed to act as trustees, each of whom agreed to receive an equal part of the sums deposited, and each to be responsible to the amount of 100*l.* for the repayment of the principal with interest. Any sum above 1*s.* was to be received, and, to encourage perseverance, interest at the rate of five *per cent.* was to be allowed for every 20*s.* which should remain a year with the trustees. For every additional 100*l.* it was agreed that a new trustee should be chosen; and thus the loss to the trustees in fulfilling their engagement, with the fluctuation of interest, could not be considerable. The benefits of the institution were to be confined exclusively to the labouring classes; but the residence of the depositors was not restricted. One great advantage attending this plan is, that it holds out to the lower classes fixed advantages, and preserves their little property from that fluctuation of value to which the public funds are liable. This was the first distinct "Bank for Savings," publicly set on foot for the benefit of the lower classes: it was founded by Mrs. Wakefield, and remained for some time under her inspection and management. Mrs. Wakefield was succeeded in the labour of conducting it by Mrs. Powell, who has appointed a treasurer, "to whom," she says, "I account after every monthly meeting, that I may not be responsible myself for the money lodged in my hands; and I have the purchases made in the funds placed in the names of two trustees." This excellent female adds, that the benefits resulting from this institution are incalculable, as it has enabled many to save sums which have made them comfortable for life, who would otherwise have spent the money at an ale-house, or lent it to their friends. "I keep," says Mrs. Powell, "the whole of the accounts myself; and carry on the business on so easy and simple a plan, that I have nothing to relate. I merely receive and pay principal and interest the first Monday in every month, for an hour and a half. I have no assistance whatever, except that I lend any money I have to the treasurer, and now and then compare his cash-book with my own. The only care I have is to keep the respective accounts correct. I have a ledger, a cash-book, an interest account, and a waste-book.—I call a meeting of the trustees once a year to audit my accounts, and those of the treasurer, which are the counterpart of mine." In July 1817, an act was passed for the protection and encouragement of banks for savings in England; and the several provisions and arrangements of this useful act are minutely detailed in the last edition of Mr. Rose's excellent "Treatise on Saving Banks." Societies similar to those of the banks for savings have become of late years very numerous both in England and Scotland; and in England and Wales many of them have opened accounts with the bank of England under the late act of parliament.

Although some few institutions of the same and others of a similar kind had been established soon after the commencement of the present century, yet their increase was slow and inconsiderable until the year 1810; when the Rev. Mr. Henry Duncan, availing himself of one of the provisions of Mr. Bone's plan already mentioned, published an account of it, and proposed that the gentlemen of Dumfriesshire should establish banks for savings in the different parishes of the county. Whilst his zeal was applauded, his recommendation was disregarded. However he steadily persevered, and determined to make the experiment in his own parish; and denominated his new establishment "The Parish Bank Friendly Society of Ruthwell." He so far succeeded,

that at the time of publishing the second edition of his essay, his capital amounted to a sum exceeding 1400*l.* About the beginning of the year 1813, a very respectable and useful society was established at Edinburgh for the suppression of beggars. Mr. J. H. Forbes, an active director of this anti-mendicant society, having acquainted himself, by a perusal of the reports for bettering the condition of the poor, with the plan of the charitable bank at Tottenham, and with the regulations of the servants' fund at Bath instituted in 1808, proposed a plan and adopted regulations for the establishment of a savings' bank in the metropolis of Scotland. From the time of the publication of the first edition of the Essay on Parish Banks, the second Report of the Edinburgh Society, and the Report of the Provident Institution at Bath, saving banks have multiplied to such a degree as to leave no room for doubt that the benefit of the system will be soon communicated to every town and village in Great Britain and Ireland. It does not appear, however, that any institution of this kind of any note was opened in London till the end of January in 1816, when the "London Savings' Bank" commenced its operation. But they are now prevalent through various parts of the city and suburbs. Of their importance and utility none can entertain any doubt; although, like other useful schemes, they may be liable to some objections. The lords' committee in their report on the poor laws, bear the following testimony in their favour. "The committee are decidedly of opinion, from every information they have received, that it is expedient to recommend the adoption of 'Provident or Saving Banks,' as likely to increase the comforts and improve the condition of the poor, and to render them less dependent on parochial relief; which, under the best and most considerate administration of it, can never be so satisfactory to the person who is the object of it, or so consistent with those honourable feelings of pride and independence, which are implanted in the breast of man, as that resource which is the result of his own industry and the produce of his own exertions." The commons' committee also report, "that they have had no difficulty in perceiving how every extension of the poor's fund is in general sure to be followed up by a more than proportional increase of actual poverty;" nor has it escaped their observation, "that the relaxation of *providential* and *economical habits* is sure to go much beyond the capability of any instituted fund to meet the effects of this relaxation." "If your committee have been desirous to recommend some gradual but effectual check to the otherwise certain growth and ultimately inevitable effects of the present system of poor laws, they have not been less attentive to the duty of suggesting every possible means of affording special encouragement and facility to meritorious industry, for rescuing itself from the evils of an habitual reliance on parochial relief; and they have looked to this part of the subject with the more anxiety, from the entire conviction, that in proportion to the aggregate number of persons who are reduced to this unfortunate dependence, must be not only the increase of misery to each individual, but also the moral deterioration of the people, and ultimately from the concurrent tendency of these evils, the insecurity and danger of the state itself. The encouragement of frugal habits would, in any state of society, be an object of importance, but your committee are strongly impressed with the opinion, that, in the present situation of the poor of this country, it is chiefly by the gradual restoration of a feeling of reliance upon their own industry, rather than upon the parochial assessments, that the transition to a more wholesome system can be effected.

"Your committee have the satisfaction of seeing the institutions for the secure and profitable deposit of the earnings of the industrious, which was heretofore projected, are now by the spontaneous exertions of individuals, in actual and successful operation; and from the growth of the system of savings-banks, they are inclined to expect very beneficial results, not only in affording to the industrious poor a secure deposit for their savings, but in familiarizing them with a practice, of which the advantage will be daily more apparent." Both the above cited reports are justified by ample evidence from the testimony of individuals, which is annexed to them. We shall here subjoin an extract from the third report of the "Edinburgh Society for the Suppression of Beggars," 1815. "To improve permanently, and effectually to better the condition of the poor, can be accomplished only by encouraging among them habits of industry, sobriety, prudence, and foregiving. The very general adoption of the plan of instituting savings' banks shews, that the genuine and enlightened principles of benevolence are beginning to be well understood, and will be zealously acted upon whenever a proper opportunity occurs; for no scheme seems better calculated for the comfort of the poor than this simple plan for enabling the poor man to lay up in the day of health for the hour of sickness. *It relieves from want without checking industry;—it secures independence without inducing pride;—it removes those painful misgivings which render the approaches of poverty so appalling, and often paralyze the exertions which might ward off the blow;—it leads to temperance and the restraint of all the disorderly passions, which a wasteful expenditure of money nourishes;—it produces that sobriety of mind, and steadiness of conduct, which afford the best foundation for the domestic virtues in humble life.* The effects of such an institution as this upon the character of the people, were it to become universal, would be almost inappreciable." But it would be endless to cite authorities for establishing a principle so universally acknowledged by all whose observation and experience render them competent judges. We are therefore the more surprised to find it asserted in the part of the Supplement to the Encyclopædia Britannica recently published, that "taken by themselves, it is at least a doubt whether savings' banks may not produce as great a quantity of evil as good." See Annals of Banks for Savings. London. Richardson, &c. 1818.

SAUSSURITE. See MINERALOGY, *Addenda*.

SAYBROOK. Add.—In 1810 it contained 3994 inhabitants, including 5 slaves.

SCALE of Chemical Equivalents. The description of this ingenious and useful instrument, contrived by Dr. Wolfaston, has been omitted in its proper place; but its importance demands that it should be introduced here.

The author states, that he does not offer this instrument as an attempt to correct the estimates that have been formed by others, but as "a method by which their results may be advantageously applied, in forming an easy approximation to any object of our inquiries."

"The means (to use Dr. W.'s own words) by which this is effected, may be in part understood by inspection of the plate, (*Chemistry, Plate XXI. figs. 5, 6.*), in which will be seen the list of substances intended to be estimated, arranged on one or other side of a scale of numbers in the order of their relative weights, and at such distances from each other, according to their weights that the series of numbers placed on a sliding scale can at pleasure be moved, so that any number expressing the weight of a compound may be brought to correspond with the place of that compound in the adjacent column. The arrangement is then such, that the weight of

any ingredient in its composition, of any re-agent to be employed, or precipitate that might be obtained in its analysis, will be found opposite to the point at which its respective name is placed.

"In order to shew more clearly the use of this scale, the plate exhibits two different situations of the slider, in one of which oxygen is 10, and other bodies are in their due proportion to it; so that carbonic acid being 27.54, and lime 35.46, carbonate of lime is placed at 63. In the second figure, the slider is represented drawn upwards, till 100 corresponds to muriate of soda, and accordingly the scale then shews how much of each substance contained in the table is equivalent to 100 of common salt. It shews with regard to the different views of the analysis of this salt, that it contains 46.6 dry muriatic acid and 53.4 of soda, or 39.8 sodium and 13.6 oxygen: or if viewed as chloride of sodium, that it contains 60.2 chlorine and 39.8 sodium. With respect to re-agents it may be seen, that 283 nitrate of lead containing 191 of litharge employed to separate the muriatic acid, would yield a precipitate of 237 muriate of lead, and that there would then remain in solution nearly 146 nitrate of soda. It may at the same time be seen, that the acid in this quantity of salt would serve to make 232 corrosive sublimate, containing 815.5 red oxyd of mercury, or would make 91.5 muriate of ammonia, composed of 62 muriatic gas, (or hydromuriatic acid,) and 29.5 ammonia. The scale also shews, that for the purpose of obtaining the whole of the acid in distillation, the quantity of oil of vitriol required is nearly 84, and that the residuum of this distillation would be 122 dry sulphate of soda, from which might be obtained by crystallization 277 of Glauber's salt, containing 155 water of crystallization. These and many more such answers appear at once by bare inspection, as soon as the weight of any substance intended for examination is made by motion of the slider, correctly to correspond with its place in the adjacent column.

"With respect to the method of laying down the divisions of this scale, those who are accustomed to the use of other sliding rules, and are practically acquainted with their properties, will recognize upon the slider itself the common Gunter's line of numbers (as it is termed), and will be satisfied that the results which it gives are the same that would be obtained by arithmetical computation." See GUNTER'S Scale.

This scale may be had at the different mathematical instrument-makers; and we need scarcely add, that the numbers laid down upon it differ a little from those recently determined by Dr. Thomson. These differences, however, are in general very trifling; but should any one prefer using the new numbers, they will find them stated in the tables appended to ATOMIC Theory.

SCAPOLITE. See MINERALOGY, *Addenda*.

SCHILLER-SPAR. See MINERALOGY, *Addenda*.

SCHOOLS, *Military*, the principal institutions of this kind in our country, where officers may be formed for the profession by acquiring sound knowledge both in theory and practice, are the Royal Academy of Woolwich, the institution at Sandhurst near Windsor, and the academy at Portsmouth.

SCHUYLKILL. Add.—Also, a township of Berks county, containing 353 inhabitants.

SCIOTO. Add.—Also, a township of Pickaway county, having 216 inhabitants.—Also, a township of Ross county, having 840 inhabitants.

SCOTLAND, col. 22, l. 29, for extent *r. extinct.*

SCOTS, l. 2, insert—those of the town included.

SCREEN, SKREEN, or ALTAR-SKREEN, in *Architecture*. (See REREDOS.) The choir-screen is the fence which separates the choir from the nave of the church.

SCRIVAN. Add—of whom 1816 were slaves in 1810.

SCROFULOUS, or SCROPHULOUS *Tumours*. See SCROPHULA, HIP-JOINT, *Disease of*, WHITE-SWELLING, &c.

SCRUBGRASS, in *Geography*, a township of Venango county, in Pennsylvania, containing 540 inhabitants.

SCULPTURE, col. 2, l. 22, omit the colon after required, and insert a comma after manner.

SEABROOK, l. 2, *r. 774.*

SEAL. Add—The broad seal of England was stolen from the lord chancellor's house in Ormond-street, March 24th, 1784; and a new one was brought into use, upon the union of Ireland with Great Britain, January 1st, 1801.

SEAL, in *Geography*, a township of Scioto county, in Ohio, having 379 inhabitants.

SEBASTICOOK, a township of America, in the district of Maine, and county of Somerset, having 105 persons.

SECRETIONS, SECRETED *Fluids*, *Chemical Properties of*. See FLUIDS, *Animal*.

SECTS of *Hindoo*s, col. 2, l. 8 and 23 from bottom for *Bhon r. Bhow*. Col. 10, l. 31, transpose the points.

SEDATIVUM SAL. Add after SALT—under the article SALTS.

SEEING, col. 3, l. 5, add—Dr. Wells, in his “*Essay on single Vision with two Eyes*,” has reduced the principal opinions upon this subject into two classes. The first class comprehends those of Galen, Alhazen, Rohault, Dr. Briggs, and Sir Isaac Newton; all of whom have regarded the question as equivalent to the following one: Why should the mind be affected with only one perception from two impressions upon the external organs of sight, since either of those impressions is of itself sufficient to produce a similar perception? To this question they reply, that the two impressions are united before they are communicated to the mind, and they only differ concerning the manner in which such an union takes place. Against the opinions now stated Dr. Wells objects, that they must be considered as mere conjectures, founded upon certain supposed changes in the brain and nerves, the existence of which, from the nature of the parts, it is impossible either to demonstrate or to refute by experiments; and that no one of them, though admitted to be true, is yet sufficient to explain the phenomena on account of which it was framed. To the second class, Dr. Wells refers the opinions of those who maintain, that an object is seen single by both eyes, because it is seen by each of them in the same external place; and who profess to point out some law, or constant rule of vision, from which this sameness of place is to be derived as a necessary consequence. This view of the question, as our author imagines, was first suggested by Agulionius, and it has been since adopted by Dechales, Dr. Porterfield, Dr. Smith of Cambridge, and Dr. Reid of Glasgow.

Agulionius, who has been followed in the same train of reasoning by Dechales and Dr. Porterfield, begins with defining the terms *horopter* and *plane of the horopter*. If a

line be drawn through the point of the mutual intersection of the optic axes, parallel to the interval between the eyes, this from its office is denominated the horopter; and a plane, supposed to pass through this line perpendicular to the plane of the optic axes, is called by Agulionius the plane of the horopter. According to his statement, it is a law of our constitution, that all bodies which we see with one glance or look, whatever are their real places, appear to each eye to be situated in this plane; and upon this supposition he shews why some should be seen single with two eyes, and others double. For according to a recent opinion, which he has advanced, and which other writers on vision have not contradicted, the two lines of direction in which an object is seen with both eyes, can meet each other only in one point, and therefore all bodies which are really situated in the plane of the horopter, must necessarily appear single, as the lines of direction in which any one of them is perceived by the two eyes, coincide in that plane, and no where else; and all bodies which are not situated in the plane of the horopter must as necessarily appear double, since, in this case, the lines of their visible directions intersect each other, either before or after they pass through it. To this reasoning Dr. Wells replies, that if the visible places of all bodies were contained in the plane of the horopter, they would appear of magnitudes proportional to the angles which they subtended at the eye; *e. gr.* a finger held near to the face would seem as large as the part of a remote building which it might conceal from the sight. But this is contrary to experience, and therefore no reasoning that depends upon it can be admitted.

If it be asked, says Dr. Smith, why, in seeing with both eyes, we do not always see double, because of a double sensation, it is sufficient to reply, that in the ordinary use of our eyes, in which the pictures of an object are constantly painted upon “*corresponding places or points*” of the retinas, the predominant sense of feeling has originally and constantly informed us that the object is single. What he means by “*corresponding points*,” he thus explains: When the optic axes are parallel, or meet in a point, the two middle points of the retinas, or any points which are equally distant from them, and lie on the same sides of them, either towards the right hand or left hand, or upwards or downwards, or in any oblique direction, are called “*corresponding points*.” Accordingly our idea of the outward place of an object is connected with both these sensations; as is manifest by its appearing in two places when its pictures are not painted upon corresponding places of the retinas; which is only a direct consequence arising from our general habit of seeing. If it be asked why, in order to produce single vision, all men agree in directing their eyes toward the object in such a manner as to receive its pictures upon corresponding points of the retinas, since custom might have connected the sensations of any other two points with the information of its unity from feeling? To this objection, suggested by Dr. Reid, the reply may be made in Dr. Smith's own words (vol. i. p. 46.): “*When we view an object steadily, we have acquired a habit of directing the optic axes to the point in view; because its pictures falling upon the middle points of the retinas, are then distinct than if they fell upon any other places; and since the pictures of the whole object are equal to one another, and are both inverted with respect to the optic axes, it follows that the pictures of any collateral point are painted upon corresponding points of the retinas.*”

Dr. Wells is of opinion, that Dr. Smith's hypothesis for the solution of this celebrated question is liable to other objections

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objections not so easily repelled. Admitting the fact respecting corresponding points to be true, it may be observed, that if we are taught by *feeling* to see objects single, notwithstanding a sensation in each eye, the informations of the former sense ought to be uniform, or else one set of visual appearances would be associated with different reports from feeling, and no certain mark would be afforded us which of them we should trust. Feeling, as Dr. Smith allows, is not always the predominant, but sometimes the inferior sense; and its informations are not constant and original, but variable and derived. When a difference occurs between the informations of the two senses, it is natural to enquire what rule have we for determining which is most worthy of credit. But supposing that the sense of touch to have originally and constantly informed us that objects are single, it would not follow that we are thence taught to see them also single. For, since the place which an object seems to either eye to possess, manifestly depends both upon its apparent distance and its apparent direction from that eye, if visible place be, in the language of Dr. Smith, only an *idea* of real or tangible place, visible direction must bear the same relation to tangible direction; whence it follows, that we can never have a more accurate knowledge of the direction, in which an object may lie from any part of our bodies, by sight than by touch. Whereas the contrary is proved by facts. Moreover whatever be the direction in which an object may appear to either eye, it cannot be seen in the same place by both, except at some point common to the two directions. Accordingly Dr. Smith says, that when an object is perceived single with both eyes, it is seen at the mutual intersection of the two visual rays; the visible direction of any object coinciding, according to him, with the visual ray, or the principal ray of the pencil which flows from it to the eye. Should we then even allow, that all we know by sight of the places of bodies has been borrowed from feeling, it will still be easy to shew, that the rule of vision for each eye, which he has derived from such experience, that of our seeing objects in the directions of their visual rays, is inconsistent with many of the phenomena of sight with two eyes; and, consequently, that he has left unremoved the chief difficulty of his subject, which was to explain the single appearance of objects to both eyes, from those laws, or rules of vision, which affect each of them singly. For it is a well-known fact, that if two bodies of the same shape, size, and colour, be placed, one in each optic axis, they appear but as one body, provided they be at equal distances from the eyes. Agreeably to the theory of our seeing objects in the direction of their visual rays, this cannot happen, except the united body appear at the intersection of the optic axes. Dr. Smith, accordingly, maintains that it does. In the first place, Dr. Wells appeals to experiment for a direct proof that it does not; and, in the second, he observes, that, as the two bodies in the optic axes appear as one, whether they be situated within or beyond the concurrence of those lines, and as a right line joining the bodies, and extended both ways, appears at the same time to the sight as a right line, it follows, upon admitting the fact which he has denied, that all objects in the plane of the optic axes which are seen in one position and state of the eyes, however near to us, or however remote they may in reality be, must appear to be equally distant, or rather in a line drawn through the concurrence of the optic axes, parallel to the interval between the eyes, and named by opticians the *horopter*. Again, if a right line be made to pass through any part of the plane of the optic axes, at right angles to it, the portions above and below this plane are perceived to be in the same right

line with the point which is situated in it, and the whole appears perpendicular to the plane. But the point in the plane is seen, by the last article or proposition, in the horopter; the whole, therefore, of the perpendicular line must be seen in a plane passing through the horopter at right angles to that of the optic axes; or, in other words, in the *plane of the horopter*, in which consequently all bodies will have their visible places. But this was the very opinion of Aguilonius, to which he was probably led by a familiar train of reasoning; though, as a teacher, he might chuse rather to ground it immediately upon an original law of our constitution.

Dr. Reid agrees with Dr. Smith in his general principle, but differs from him in maintaining the property to be original by which any two places in the retinas exhibit only one object, while Dr. Smith derives it altogether from custom. They differ also with respect to the meaning of a term; Dr. Smith calling *corresponding points*, such as have the position just mentioned, whether they represent objects single or not; whereas Dr. Reid says, that those points correspond, whatever their position may be, which represent objects single; and he appears to Dr. Wells not always to attend to the double use of the same term, when he speaks of the opinions of Dr. Smith.

Could it be shewn, says Dr. Wells, that the places of the two retinas, which represent an object single when each receives its picture, are not the centres, or such others as are similarly situated, an obvious inference would be, that the single appearance of the object is not occasioned by a property in those places, bestowed upon them for this special purpose by nature; it being reasonable to expect, that such a property should be found, if any where, in those parts of the retinas which are the most like to each other.

Anatomists have commonly taught, that the centres of the spheres, to which the cornea, the ball of the eye, and the two portions of the crystalline belong, are all placed in the same right line, hence called the optic axis, and that this being produced both ways, passes through the centres of the cornea and retina, considered as surfaces. Opticians, on their part, observe, that an object appears single to both eyes, when the axis of each is accurately directed to it; from which they infer, that the centres of the retinas agree in suggesting but one object, though each receives its picture.—Again; since it is known by experience, that, while any object is seen single, to which the optic axes are turned, others at the same distance from the eyes likewise appear so; and since the pictures of these lateral objects fall upon points in the two retinas, equidistant from their centres, and both upon the same side, that is, both to the right or left of the centres, or both above or below them, opticians conclude, that every two places of the retinas, which are similarly situated with respect to the centres, must also agree in exhibiting but one object, though pictures are received by both.

But the whole of this reasoning, says Dr. Wells, is built upon a circumstance in the fabric of the eye, which has been shewn by some of the most eminent anatomists not to have place. For Varolius long ago observed, that the crystalline is not situated in the middle of the eye, but more *inwardly*; and the accurate Zinn has more lately mentioned, that if the eye be divided into a right and left half, the centre of the crystalline will be found in the inner portion. Haller confirms this fact; and Winflow's observation, that the centres of the pupil and iris do not coincide, but that the former is nearer to the nose than the latter, is connected with it; since both Zinn and Haller agree, that

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the centre of the pupil is placed in the axis of the crystalline, while that of the iris is evidently in the common axis of the cornea and globe. Now, a consequence of this position of the crystalline is, that, contrary to what is universally maintained, no ray of light whatsoever can pass un bent to the retina from the atmosphere, or any other medium differing in refractive power from the aqueous humour. If, then, the line joining the centres of the cornea and globe of the eye be what is called the optic axis, and if it be true, that objects appear single when we direct both these axes to them, it must be evident, to such as are acquainted with the common rules of optics, that the pictures of those objects do not fall upon the centres of the retinas, but more internally; and, therefore, that the centres and all the other points of those membranes, which by the present system are supposed to represent objects single, do in fact exhibit them double.

Admitting, however, that objects are represented single, when their pictures fall upon the centres of the retinas, or upon any other two points which are equally distant from the centres, and both upon the same side, it appears to Dr. Wells, notwithstanding, to be in violation of all analogy, to ascribe this effect, with respect to the points at least, on the right and left sides of the centres, to any peculiar property which they possess from nature. For when anatomists find, in a new species of animals, organs similar in structure to those of others they are already acquainted with, they immediately conclude, that they are also similar in regard to their use. In animals of the same species, they believe with certainty, that the organs they see in one have the same properties as the corresponding organs of another; and, if it be possible, they attribute with greater certainty the same properties to two organs of the like kind, which are found in the same individual. Such is the influence of the rule, that resemblance of property is implied by resemblance of structure. Now it is an universal fact, that if an animal be divided into a right and left half, the corresponding parts of those organs which exist in pairs are found at equal distances from the plane of partition. Thus, for instance, in respect to the eyes, the two optic nerves penetrate their outward coat at the same distance from this plane. Their muscles, blood-vessels, and every other of their component parts and appendages, are arranged in the like manner; those nearest to the dividing plane, or the innermost, in the one, being similar in structure to the innermost in the other, the outermost to the outermost, and the intermediate to the intermediate. It is surely, therefore, natural to expect, that such parts should also be similar in their properties; and we in fact find this similarity to exist, wherever it can be clearly ascertained what the properties are. Every person, for example, admits, that the internal straight muscle of the right eye performs the same office, with respect to that eye, as the other internal straight muscle does with respect to the left eye. What judgment are we then to form of the opinion of Dr. Reid, which attributes the same original properties, or rather the joint possession of one original property, to places in the retinas situated at unequal distances from the general plane of partition; which makes an *external* point in one correspond, in use, with an *internal* point in the other, and this too by a principle implanted by nature? If such things exist, they may, at least, be said to stand opposed to a most extensive analogy.

To these arguments, *à priori*, against the opinion of Dr. Reid, Dr. Wells adds others derived from a consideration of its consequences: but our limits oblige us to refer for these to the author's own account. If objects, it may

be said, appear single neither from custom, nor from an original property of the eyes, have we not an effect without a cause, and must there not be something wrong in the facts or reasoning which lead to such a conclusion? Dr. Wells replies: Since visible place contains in it both visible distance and visible direction, it is not necessary that the single appearance of an object to both eyes, should depend altogether either upon custom, or an original principle of our constitution; for its visible distance to each eye may be learned from feeling, and its visible direction be given by nature; in which case, the unity of its place to the two eyes, will be owing to neither of those causes singly, but to a combination of both; and this Dr. Wells regards as a sufficient reply.

Dr. Wells proceeds to propose and illustrate his own theory for the solution of the question, why objects are seen single with two eyes; or, in other words, why they appear in the same place to both? The visible place of an object being composed, as he conceives, of its visible distance and visible direction, it becomes necessary, for shewing how it may appear the same to both eyes, to explain in what manner the distance and direction, which are perceived by one eye, may coincide with those which are perceived by the other. He begins with a consideration of the distance. In judging of distance by sight, no person has ever observed, that while an object seemed to one of his eyes at a certain distance, it has appeared to the other to be at a different distance, and from this circumstance alone has been seen double; or, to express the same thing in another way, that while the visible appearance of an object to one eye, covered the visible appearance of the same object to the other eye, the two appearances did not seem entirely to coincide, and make one, but were seen separate by the two eyes. Hence it follows, that the difficulty in finding a true and sufficient cause for the union of the two visible places of one or two objects to two eyes, must therefore consist altogether in shewing, in what manner the two apparent directions may coincide, consistently with the attending phenomena.

From the time of Kepler's discovery of the seat and manner of vision, there have been, says our author, only two theories offered respecting the apparent directions of objects. One is, that they are perceived in the direction of lines passing from their pictures on the retina, through the centre of the eye; the other, that their apparent directions coincide with their visual rays. But both of these theories are inconsistent with the phenomena of single vision with two eyes. For according to neither of them can an object, placed at the concurrence of the optic axes, be seen single, unless we have a most accurate knowledge of its distance; nor will either admit two objects to be seen as one, which are situated in the optic axes, whether on this side, or beyond where they meet, unless the united object be referred by sight to their very point of intersection; both of which conclusions are contradicted by experience. It is evident, therefore, that some other theory of visible direction is required, which shall not be liable to these objections.

Dr. Wells's theory is illustrated in the following propositions, which we can merely state without enlargement: 1. Objects situated in the optic axis do not appear to be in that line, but in the common axis; *i.e.* in a line drawn from the middle of the visual base, through the point of intersection of the optic axes, or parallel to them, if they be parallel to each other. 2. Objects, situated in the common axis, do not appear to be in that line, but in the axis of the eye, by which they are seen. 3. Objects, situated in any line drawn through the mutual intersection of the optic

optic axes to the visual base, do not appear to be in that line, but in another, drawn through the same intersection, to a point in the visual base distant half this base from the similar extremity of the former line, towards the left, if the objects be seen by the right eye, but towards the right, if seen by the left eye. In the application of the theory which Dr. Wells has endeavoured to establish in the preceding propositions, he observes, that, if the question be concerning an object at the concurrence of the optic axes, it is seen single, because its two similar appearances, in regard to size, shape, and colour, are seen by both eyes in one and the same direction, -or, if you will, in two directions, which coincide with each other through the whole of their extent. It therefore matters not, whether the distance be truly or falsely estimated; whether the object be thought to touch our eyes, or to be infinitely remote. And hence we have a reason, which no other theory of visible direction affords, why objects appeared single to the young gentleman mentioned by Mr. Chefelden, immediately after his being couched, and before he could have learned to judge of distance by sight.

When two similar objects are placed in the optic axes, one in each, at equal distances from the eyes, they will appear in the same place, and therefore one, for the same reason that a truly single object, in the concurrence of the optic axes, is seen single. Here again, as the two visible directions coincide in every point, it is not necessary that the united appearance should be judged to be at any particular distance; that it should be referred, for instance, to the concurrence of the optic axes, where the two other theories of visible direction are obliged to place it, in opposition to the plainest observation.

Objects, any where in the horopter, will be seen single, because their apparent directions to the two eyes will then completely coincide. And for a contrary reason, those placed in any other part of the plane of the optic axes will appear double. To make these things evident, let a line pass through the point of intersection of the optic axes and any given object, to the visual base, which is to be produced, if necessary; and let it be called the line of the object's real position. Take afterward, in the visual base, or its production, two points, one on each side of the line of real position, and both distant from its termination there, half the visual base. Lines drawn from these points, through the point of intersection of the optic axes, must consequently contain the two visible positions of the object. But when this is situated in the horopter, the line of real position will coincide with the horopter, and will not therefore reach the visual base, unless at an infinite distance from the eyes. For which reason, the two lines, containing the visible positions of the object, must fall upon the visual base at a like distance, and must consequently be regarded as coinciding with each other. When the object is not in the horopter, the two lines of visible direction will be found, by the same means, not to coincide.

SEGO, col. 2, l. 13, r. Manfong; l. 17, r. Sandfandng.

SELENIUM, in *Chemistry*, the name of an elementary substance recently discovered by Berzelius, and considered by him as a kind of semi-metal. This substance was first mistaken for tellurium. It was obtained from a sulphuric acid manufactory at Griphholm, where pyrites from the mines of Fabun were employed, and which of course contained the substance in question. It also exists in the same mines combined with copper. Selenium has the properties of a metal combined with those of sulphur to so great a degree, that it is difficult to know under which

head to class it, and in short whether it might not be rather considered as a new species of sulphur. In its metallic state it has a brilliant metallic lustre externally, with a tinge of red. The fracture is vitreous, like that of sulphur, but with a very brilliant lustre of a grey colour. It becomes soft at a temperature of 212°, and at a higher temperature it melts; and at a temperature about equal to that at which mercury boils it may be distilled. When in a gaseous state, it is yellow, like sulphur. When sublimed in a large vessel, it is deposited in the form of flowers of a cinnamon colour, but not oxidized. During its cooling, it preserves for some time a certain degree of fluidity, so that it may be moulded between the fingers, and drawn into threads, which are transparent, and of a ruby-red colour when held between the eye and the light; but by reflected light they exhibit a brilliant metallic lustre. It burns with an azure-blue flame when heated with a candle, and exhales a strong odour of horse-radish.

Selenium combines with metals, and generally produces a reddish flame. The alloys are commonly grey, with a metallic lustre. The seleniuret of potassium dissolves in water, without evolving any gas, and produces a red-coloured solution, which has the taste of hydrosulphuret of potash. When muriatic acid is poured upon this seleniuret, a seleniuretted hydrogen gas is disengaged, which is soluble in water, and precipitates all metallic solutions, even those of zinc and iron. This gas has the odour of sulphuretted hydrogen gas when it is diluted with air, but if it be breathed less diluted it produces a painful sensation in the nose, and a violent inflammation, ending in catarrh, which continues for a considerable time.

Selenium combines with the alkalis both in the humid way and by fusion. These combinations are red. The seleniurets of barytes and lime are also red, but they are insoluble. It also dissolves in melted wax, and in the fat oils; the solutions are red, but have no hepatic odour. There exist also seleniuretted hydrofeleniurets of the alkalis and of the earths.

Selenium dissolves in nitric acid by the assistance of heat; the solution evaporated and sublimed yields a mass crystallized in needles, which is a pretty strong acid. It has a pure acid flavour, and forms peculiar salts with the alkalis, earths, and metallic oxyds. The selenic acid is soluble in water and in alcohol: its combinations with potash and ammonia are deliquescent; the latter is decomposed by fire, water is given out, and the selenium is reduced. The seleniates of barytes and lime are soluble in water. The selenic acid mixed with muriatic acid is decomposed by zinc, and the selenium is precipitated in the form of a red powder; by sulphuretted hydrogen gas an orange-yellow precipitate is formed.

Such is a brief summary of the properties of this curious substance. From the small quantities in which it has hitherto been found, we believe no experiments have been made to ascertain the weight of its atom, &c.

SELKIRK, l. 23 from bottom, for 440 r. 439.

SELKIRKSHIRE. In 1811 this shire contained 1080 houses, and 5889 persons; viz. 2750 males, and 3139 females; 500 families being employed in agriculture, and 363 in trade, manufactures, and handicraft.

SENECA. Add—Also, a county of New York, containing 16,600 inhabitants, of whom 101 are slaves.—Also, a town of Guernsey county, in Ohio, having 300 inhabitants.

SEPOY, a term used in India to denote a native soldier.

SERA-WOLLIES. See KAJAAGA.

SERICA. Add—(See THIBET.) Hugh Murray, esq. in his "Ancient Geography of Eastern and Central Asia,"

published in the Edinburgh Transactions, concludes from the works of Ptolemy and his contemporaries, that Serica was China.

SERMON, col. 4, l. 38, for Buller *r.* Butler.

SERPENTARIUS, or SNAKE-EATER, in *Ornithology*, a genus of birds allied both to Vulture and Falco, but most nearly to the former. The characters are, beak vulturine, tongue pointed, and legs very long. It includes one species, *viz.* the *S. Africanus*, or ash-coloured snake-eater, with the hind-head crested, the tail cuneated, and the middle tail-feathers lengthened. This is the *V. Serpentarius* or Secretary vulture of Latham, and the Falco Serpentarius of Gmelin's Linnæus. The most accurate description is that of La Vallant, who, in his African travels, had an opportunity of observing it in its native regions. We refer to the 7th volume of Shaw's Zoology. It is an inhabitant of dry open plains in the lower parts of Africa.

SERPENTES.—ATER, l. 1, *r.* is white with black bands.

SEVIER, l. 2, *r.* 4595, and 294.

SHAPLEIGH. Add—containing 2362 inhabitants.

SHARON. Add after Portland—containing 944 inhabitants.—After Litchfield, having 2506 inhabitants.—After Boston, having 1800 inhabitants.—After Norwich, having 1363 inhabitants. Add—Also, a town of Hillborough county, New Hampshire, having 416 inhabitants.—Also, a township of Franklin county, in Ohio, having 450 inhabitants.

SHARP, GRANVILLE, col. 3, l. 33, for taken up on *r.* taken upon.

SHAT-UL-ARAB, l. 16, *r.* Bamisthere and Mefene; l. 20, *r.* Hafar.

SHENANGO. Add—Also, a township of Mercer county, having 634 inhabitants.—Also, a township of Beaver county, having 679 inhabitants.

SHEPEY. Add—The largest parish in this island is that of Minister, which in 1811 contained 840 houses, besides 20 that were not finished, and 5318 persons; *viz.* 2596 males, and 2722 females: 87 families being employed in agriculture, and 1163 in trade, manufactures, or handicraft.

SHILLINGSTONE, or SHILLING OKEFORD, a parish in the west-division of Shantton, in the county of Dorset, which in 1811 contained 75 houses, and 385 inhabitants; 163 males, and 222 females. On the right of the village are two high hills, called Hood and Hawkledon, on which are the remains of an ancient Roman encampment.

SHOES, col. 3, l. 29 from bottom, for felt *r.* left.

SHOREA, in *Botany*, in honour of sir John Shore, lord Teignmouth, late governor of Bengal.—Roxb. Corom. v. 3. 9. Gært. v. 3. 48. t. 186.—Class and order, *Polyandria Monogynia*. Nat. Ord. *Guttifera*, Juss.

Gen. Ch. Calyx of five imbricated leaves, subsequently enlarged, permanent. Petals five. Capsule superior, of one cell and one valve. Seed solitary.

1. *S. robusta*. Saul-tree. Roxb. t. 212.—Found on the skirts of the northern mountains of India. A majestic tree, whose timber is much used, and next in value to the teak, (see *Tectona*,) being stronger, though far less durable. Leaves alternate, stalked, ovate, entire, acute, smooth, from four to eight inches long. Panicles downy, axillary and terminal, of numerous, pale yellow, itarry flowers, not an inch wide. Capsule accompanied by five oblong, ribbed, unequal wings, formed of the calyx. This genus is nearly allied to *Dipterocarpaceus*; see that article.

SHORT CREEK, in *Geography*, a township of Jefferson county, in Ohio, having 1890 inhabitants.

SHORT-SIGHTEDNESS, l. 21, add—For Mr. Ware's observations on this subject, see SPECTACLES.

SHREWSBURY, in America, l. 8, add—of whom 577 are slaves. At the end, add—Also, a township of Lycoming county, containing 294 inhabitants.

SHROUD, l. 3, add—but the statute for this purpose has been repealed.

SHUKUSKU, *r.* or SHUKASHU.

SHUSTER, l. 24, for magnitude *r.* magnificence.

SIBH, a district of the Persian empire, in the province of Mekran, consisting of an extensive plain, governed by a chief, who resides in a small town of the same name. The country, almost destitute of water, though a river, nearly dry, flows through the centre of the plain, is, generally speaking, barren, if we except some groves of date-trees which formerly grew in the bed of the river.

SIDNEY, Sir PHILIP, in *Biography*, the eldest son of sir Henry Sidney, by a daughter of the duke of Northumberland, was born at Penhurst in Kent, in the year 1554. He was named Philip in compliment to the king of Spain, the husband of queen Mary. In very early life he manifested a sedate studious disposition; and he sedulously improved every advantage for gaining knowledge, which he enjoyed, first at Shrewsbury school, and afterwards at Oxford, where he was entered at Christchurch college in 1569, and also at Cambridge. At the age of 18, the queen, according to the then existing custom, granted him a licence to travel abroad; and he first visited Paris, where he was introduced, by his maternal uncle, the earl of Leicester, to sir Francis Walsingham, the English ambassador. Charles IX. who was then king of France, wishing to shew respect

to Leicester, and probably with the perfidious design of lulling into security the Protestant party in France, previously to the horrid massacre of St. Bartholomew's, appointed Sidney one of the gentlemen of his bed-chamber. When the fatal day arrived, Sidney, together with several of his countrymen, found a refuge in the house of the English ambassador. Soon afterwards he pursued his tour to Germany; and at Frankfort formed an intimate acquaintance and friendship with Hubert Languet, then resident for the elector of Saxony, whose communications were singularly useful to our young traveller. After visiting Vienna, Hungary, Venice, and Padua, in company with his friend Languet, he returned through Germany and Flanders, and arrived in England in 1575, with those accomplishments, and with his moral principles in untainted purity, which rendered him the admiration and delight of his countrymen. In the following year, being only in the 22d year of his age, he was dispatched as ambassador to the court of Vienna, to condole with and congratulate the new emperor Rodolph II.; and entrusted with a commission to engage the Protestant princes of Germany in a league with each other, or with England. He was also entrusted to demand the repayment of the sum advanced by Elizabeth to the elector palatine. In the discharge of these several trusts, he acquitted himself with singular reputation, and with satisfaction to all the parties concerned in the objects of his embassy. After his return, he received no other honorary recompence besides the office of cup-bearer to the queen. With a temper somewhat irascible, and a high sense of honour, blended in some degree with the spirit of chivalry, few characters in that age were so unexceptionable as that of Sidney. Of his disinterested patriotism, we have a striking instance in his remonstrance addressed to queen Elizabeth on her projected marriage with the duke of Anjou; and such was the estimation in which he was held by the queen, that she did not manifest her displeasure against Sidney, though others suf-

fered

ferred for their interference. Actuated by the spirit of chivalry, he exhibited his skill in military manœuvres at a tournament held, in 1580, in honour of the queen; and in the same year, he asserted his rank as a gentleman, against an insult offered him at a tennis-court by Vere, earl of Oxford. In order to compose his mind, which had been thus disquieted, he retired to the house of his brother-in-law, the earl of Pembroke, at Wilton, and engaged in the composition of his well-known romance, called "Arcadia," which was not published till after his death. In 1581 his name appears as one of the knights of the shire for the county of Kent, and as one of the committee for drawing up acts, with a view to the security of the kingdom against the Pope and his adherents. His "Defence of Poetry," written about this time, contributed more to his literary reputation than Arcadia. Of this treatise one of his biographers says, that it may be "considered as the earliest piece of criticism in the English language worthy of attention, and reckoned by some the best written of his works. In a simple and unaffected style, it displays much learning and judgment, and a true relish of the excellencies of that art which he undertakes to patronize and illustrate." In the year 1583, he married the only daughter and heiress of sir Francis Walsingham, a lady, as it is said, of great beauty and merit. On occasion of being nominated by the prince palatine of the Rhine his proxy at the installation of the garter in 1584, he received from the queen the honour of knighthood; an honour which he was not lavish in conferring. When sir Francis Drake was projecting a secret naval expedition, sir Philip Sidney wished to join him, and with this view to equip a land and naval armament against the Spanish settlements in America; but the queen interposed, and absolutely prohibited the execution of his design. Of his nomination as a candidate for the vacant crown of Poland, upon the death of Stephen Bathori in 1585, we shall say nothing; as one of his biographers has stated several particulars, which render the fact very improbable. In the year just mentioned, sir Philip had a seat in the privy council; and queen Elizabeth determining to assist the Low Countries in their revolt, on condition of their putting into her hands some cautionary towns, indulged his martial disposition by appointing him governor of Flushing. As soon as he had taken possession of his charge, he was made colonel of all the Dutch regiments, and captain of a band of English soldiers. He was soon joined by his uncle Leicester, as general of the auxiliary forces, and sir Philip was appointed general of the horse, under his command. It soon appeared that Leicester was unfit for the trust reposed in him; his nephew was dissatisfied, and endeavoured to ally the discontents which prevailed among the subordinate commanders. Sir Philip in his first exploit, which was the surprize and capture of Axell, in July 1586, without the loss of a man, was singularly successful; but in the month of September he fell in with a convoy sent by the enemy to Zutphen, and having one horse shot under him, he mounted another; and while charging the foe with great vigour, he received a musket bullet above the knee, which broke the bone and penetrated deep into the thigh. On his way from the field to Leicester's camp, whither he was conveyed, he found himself faint and thirsty, and called for water; but as he was preparing to drink, he observed a soldier in the agonies of a mortal wound; he resigned the draught to him, with an expression which entails permanent honour on his memory: "This man's necessity is still greater than mine!" Upon his arrival at Arnhem a mortification ensued, and on the 17th of October, after exhibiting the most unaffected piety, exemplary composure, and self-possession, he expired with tranquillity at the early age of 32

years. His death was universally regretted by his enemies as well as friends, and abroad as well as at home. The queen directed his body to be brought to London, and after lying in state, he was interred with all the solemnity of a public funeral in St. Paul's cathedral; and although no monument was erected over his remains, James, king of Scotland, composed an epitaph to celebrate his memory, and both universities furnished some collections of verses to record his fame. But his name will ever live in the records of history, as "one of those who have reflected the highest honour on his country." Of his "Arcadia," we shall merely observe, that it was one of the earliest specimens of grave or heroic romance; that it was left in scattered fragments of MS., which his sifter collected and published; and from this circumstance, it was denominated "The Countess of Pembroke's Arcadia." It became very popular, and was translated into foreign languages. Lord Orford (Horace Walpole) speaks of it very contemptuously; but Dr. Zouch has more candidly and more justly appreciated its value. Biog. Brit. Zouch's Mem. of Sir Philip Sidney. Gen. Biog.

SIDNEY, or SYDNEY, ALGERNON, the second son of Robert, earl of Leicester, by Dorothy, eldest daughter of Henry Piercy, earl of Northumberland, was born in 1621 or 1622, and carefully educated under his father's inspection. In early life he was destined to the military profession, and in 1641 he had a commission in his father's own regiment of horse, when he was appointed lord-lieutenant of Ireland. During the rebellion in that kingdom he entered immediately into active service, and had many opportunities of exhibiting his courage. In 1643, upon the commencement of the war in England between the king and parliament, he obtained permission to return. He and his brother, upon their landing, were intercepted, and placed under guard; and the king, conceiving (justly, as the event proved) that they had been taken by their own contrivance, was much offended; and not without reason, for they both joined the parliamentary army. In 1644, the earl of Manchester appointed Algernon to the command of a troop of horse in his own regiment; and in the following year, Fairfax promoted him to the colonelcy of a regiment of horse. Having been present in several actions, he was entrusted with the government of Chichester. In 1646 he accompanied his brother to Ireland, and was advanced to the post of lieutenant-general of the cavalry and governor of Dublin. For his services in that kingdom he received the thanks of parliament, and returning to his own country was made governor of Dover. Although he was nominated in 1648 a member of the high court of justice for the trial of the king, he was neither present when sentence was pronounced, nor did he sign the warrant for his execution. This part of his conduct, it is supposed, was owing to the particular request of his father; for it appears, from his general conduct, that his principles would not induce him to condemn this act. When he was afterwards a voluntary exile in Denmark, and charged by his father with the violence of his political sentiments, his father writes to this purpose: "It is said that the university of Copenhagen brought their *album* to you, desiring you to write something therein, and that you did *scribere in albo* these words:

"Manus hæc, inimica tyrannis,
Ense petit placidam sub libertate quietem,"

and put your name to it; also, that a minister, being there in company with you, said, 'I think you were none of the late king's judges, nor guilty of his death.' 'Guilty!' said you; 'do you call that guilt? Why, it was the justest and bravest action that ever was done in England, or any

where else." Confidently with the sentiments avowed on this occasion, Sidney actually opposed the designs of Cromwell; and he afterwards refused to act under him and under his successor Richard. During this period he passed a retired life at Penshurst, and employed himself, as it is said, in writing his Discourses on Government. But when the Long Parliament regained its power, Sidney hoping for the establishment of a republic, to which form of government he was ardently attached, became an active partisan, and was nominated one of the council of state. He also accepted the office of one of the commissioners for mediating a peace between Denmark and Sweden, and was actually engaged in this embassy at the period of Charles II.'s restoration. Although he was solicited by general Monk and others to return to England, he could repose no confidence in the royal party, but remained in exile for seventeen years, finding that the few supplies which he received from home were insufficient to support him in a manner suitable to his birth and rank. He was, however, treated with respect and civility in various places, and particularly at Rome; and he employed his many leisure hours in making addition to the ample stock of knowledge which he had already acquired. In 1677 his father, being advanced in life, was anxious to see him, and employed his interest in obtaining the king's permission for his return, to which permission was annexed a pardon for all his past offences. When he afterwards joined in cabals against the court, he incurred the censure of those who were disposed to take offence; and Mr. Hume has charged him with acting counter to the moral principles of gratitude and with a breach of faith: others, however, have vindicated him, alleging that unconscious of guilt he might consider the royal permission to return, after so long an absence, as a reparation of injustice rather than an act of clemency, and that personal obligation ought not to influence his public conduct, when he conceived the great interests of his country in danger. At the time of his return, parliament was urging the king to commence a war with France; but Charles, being a pensioner of the French court, wished from selfish motives to avoid it; but as he was actuated by no sound principles, it was apprehended that he would appear to concur with the wishes of the nation, that he might have a plea for raising supplies, for his own personal gratification, in the prosecution of his pleasures or of his designs to render himself arbitrary. The English patriots were averse from war, and some of their leaders intrigued with Barillon, the French ambassador, for preventing it. In the list of those persons in England who were at this time pensioners in France, the name of Sidney appears. When this discovery was made by Sir J. Dalrymple's publication of Barillon's papers, the friends of liberty were astonished and grieved; and they hesitated in admitting this dishonourable charge. In vindication of Sidney some have suggested, that Barillon falsified his accounts of the money with which he had been entrusted; whilst others have satisfied themselves with that persuasion of Sidney's honour and integrity which was founded on his general conduct, and with the assurance that he always adopted and pursued those political measures which appeared to him, all circumstances considered, most beneficial to his country. Upon his father's death, he joined the opposition party without disguise, and offered himself for a seat in parliament; but he was twice defeated by the influence of the court. Thus exasperated, and apprehending the liberty of his country to be in danger, as well as dreading a popish successor, the ardour of his mind urged him to associate with the duke of Monmouth and his party; and in the history of the Rye-house plot

he was charged with being one of six who were promoting an insurrection. But the part which he was supposed to have taken in a conspiracy for assassinating the king was the plea for arresting him, together with Ruffell and several others, in June 1683. When lord Ruffell was sacrificed, the next victim selected by the court was Sidney; and he was brought to trial for high treason, before that judge whose infamous character is indelibly recorded in the page of history, chief-justice Jefferies. Lord Howard, who was a disgrace to the title he bore and to that rank in society with which he was connected, was the only direct evidence against him; but the law required two witnesses for conviction on a charge of treason. In order to supply this defect, the attorney-general produced some passages from discourses found in manuscript in his closet, in which the writer maintained the lawfulness of resisting tyrants, and his preference of a free to an arbitrary government; and without decisive proof that they were written by him, or that they were even communicated to any living person, this kind of evidence was admitted, in defiance of law and common sense, as equivalent to the testimony of a second witness. His defence was of no avail, and a servile jury pronounced him guilty. From respect to his family, the disgraceful part of his sentence was omitted, and exchanged for beheading. On the 7th of December he was executed on Tower-hill, at the age of about sixty-one years, delivering to the sheriffs a paper which proved the injustice of his condemnation, and offering a prayer for that "old cause" in which he had been from his youth engaged. This paper was afterwards printed, and made great impression on the public mind. It is given at full length in the Memoirs of his Life. He suffered with the firmness, as it is said, of an old Roman. After the revolution one of the first acts was the reversal of his attainder, and his name has been held in high esteem and veneration by all the avowed friends of free government. The following sketch of his character is given by bishop Burnet. "He was a man of most extraordinary courage, steady even to obstinacy, sincere, but of a rough and boisterous temper that could not bear contradiction. He seemed to be a Christian, but in a particular form of his own; he thought it was to be like a divine philosophy in the mind, but he was against all public worship, and every thing that looked like a church. He was stiff to all republican principles, and an enemy to every thing that looked like monarchy. He had studied the history of government in all its branches beyond any man I ever knew; and had a particular way of insinuating himself into people that would hearken to his notions, and not contradict him." Of this character, it is said, in the Notes to the Memoirs of his Life, that it was roughly and inaccurately drawn. Sidney's "Discourses on Government" were first printed in 1698, fol. reprinted in 1704 and 1751, and in 4to. 1772 at the expense of Thomas Hollis, esq., with his letters, trial, and memoirs of his life prefixed. Lord Orrery says of them, "they are admirably written, and contain great historical knowledge, and a remarkable propriety of diction; so that his name, in my opinion, ought to be much higher established in the temple of literature than I have hitherto found it placed." Biog. Brit. Gen. Biog. Memoirs, &c. prefixed to Hollis's edition.

SIFEEED ROOK. See ROOD.

SILENI, l. 20, for *faccho* *r.* *Jaccho*; l. 33, for second *r.* sixth.

SILICA, SILICON, in *Chemistry*. From the recent experiments of Berzelius and Stromeyer, the basis of silicon does not appear to be a metal as formerly supposed, but a substance analogous to boron and carbon; hence it has been named

named *filicon*. Little is known, however, of the nature of this substance, except that it is dark-coloured, and will bear a considerable heat without undergoing change, and that it decomposes water, and is converted into silica when brought in contact with that fluid. It is also capable of combining with iron, and probably other metals. Dr. Thomson estimates the weight of the atom of filicon, from the experiments of Berzelius and Stromeyer above-mentioned, at 10, and of silica at 20. The same chemist also considers filicon to be an acid, and proposes for it the name of *filicic acid*, in which case its compounds must be denominated *filicates*.

SILVER, in *Chemistry*. Dr. Thomson, from the most recent experiments on this metal and its salts, estimates the weight of its atom at 137.5, that of oxygen being 10. See *ATOMIC Theory*.

SILVER Ores. See **SILVER**, and **MINERALOGY**, *Addenda*.

SILURES, col. 2, l. 32, *r.* Wilk or Ulk.

SIMIA FATUELLUS, l. 1, for tailles *r.* long-tailed.

SITACA. Add—twelve geographical miles below Bagdad, and nearly opposite to the embouchure of the Dealla river.

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SITTINGBOURNE, a town and parish of Kent, 40 miles from London, in the road to Canterbury; contained, in 1811, 230 houses, and 1362 persons; 633 being males, and 729 females.

SKIDDAW, l. 15, after *fea*, add—which differs little from 3017 feet, the barometrical measurement of Mr. W. Allen, according to the method proposed by sir H. Englefield. (See *Trans.* of the Geol. Soc. vol. iv. part 2.)

SLATE-SPAR. See **MINERALOGY**, *Addenda*.

SLAVE, col. 2, l. 40, for Almighty *r.* A mighty. Col. 7, l. 19 from bottom, for African.

SLAVE-TRADE, *Abolition of the*, col. 2, l. 12, for principled *r.* principled.

SLIDING-RULE. Add—Mr. Bevan has lately published in the Philosophical Magazine an ingenious modification of the sliding-rule. By the inversion of the slider all the usual operations are performed, together with the extraction of the square root, and factors of any given number are found by simple inspection. At the same time, the instrument is reduced to half its usual size.

SMITH, in *Geography*, l. 2, add—of whom 2201 are slaves.

SNORING. Add—See **LARYNX**.

SNOW, col. 2, l. 3 from bottom, *r.* earth, and of bodies on its surface, is prevented from escaping by radiation to the heavens during still or dewy nights. The cause of this additional cold does not, indeed, constantly operate; but its preference, during only a few hours, might effectually destroy plants, which now pass unhurt through the winter. Moreover, while low vegetable productions are prevented, by a covering of snow, from becoming colder than the atmosphere in consequence of their own radiation, the parts of trees and tall shrubs, which rise above the snow, are little affected by cold from this cause: for their outermost twigs, now that they are destitute of leaves, are so small, that they will very seldom become more than 2° colder than the atmosphere. The larger branches too, which, if fully exposed to the sky, would become colder than the extreme parts, are, in a great degree, sheltered by them; and, in the last place, the trunks are sheltered both by the smaller and

larger parts, not to mention that the trunks must derive heat, by conduction through the roots, from the earth kept warm by the snow. In a similar way is partly to be explained, the manner in which a layer of earth or straw preserves vegetable matters in our own fields, from the injurious effects of cold in winter. It may be remarked, however, that a thick covering of snow, while it renders the surface of the earth warmer than it would otherwise be, must occasion the lower atmosphere to be colder, by preventing the passage of the heat of the ground to the air, either by radiation or conduction. Wells's *Ess.* p. 258. See **DEW** and **HEAT**.

SNOWDON, l. 17, after *fea*, add—according to Mr. W. Allen's barometrical measurement, 3595.9 feet.

SOAP-STONE. See **MINERALOGY**, *Addenda*.

SODA. See **SODIUM**. Add—under **NATRON**, l. 5, *r.* Natron, from an erroneous supposition of its being of the nature of nitre, has been by many. Col. 2, l. 35, *dele* vegetable alkali. Col. 4, l. 33, for a further account of barilla, see **CARBONATE of Soda**. Under the article **LEATHER**, l. 17, for a species of salt-petre *r.* a **CARBONATE of Soda**; which see.

SODA, *Sodium*, in *Chemistry*. From the most recent and correct experiments, the weight of the atom of sodium has been estimated by Dr. Thomson at 30, and consequently the weight of the atom of soda at 40, that of oxygen being 10.

SODAIC POWDERS, denote powders which are used as a substitute for soda-water. Professor Brande, in his course of chemical lectures at the Royal Institution, took occasion to observe, that though these powders produce an effervescence when dissolved, arising from the disengagement of carbonic acid, the solution is very different from soda-water, both in its constituent parts and its properties. These powders consist of an alkaline carbonate, either of potash or soda, and a concrete acid, reduced to powder. The acid, though sold as the citric, is in reality the tartaric acid, produced from the substance known as cream of tartar. When the powders are dissolved, the tartaric acid unites with the alkali, and the carbonic acid, or fixed air, immediately escapes, occasioning a momentary effervescence. A salt is formed in the solution, called by chemists the tartrate of potash, or soda: if the former alkali has been used, and the acid is in excess, the salt formed is nearly insoluble, and has a harsh taste, and an irritating effect on the stomach. Thus, a quantity of alkaline tartrate is taken into the system, which rather tends to increase than remove obstructions, and in many instances must be highly injurious. Soda-water, if prepared in the best manner, should contain a very small portion of carbonate of soda, which has a tendency to correct acidity on the stomach; it should contain also about eight times its own bulk of carbonic acid gas, part of which is in a state of loose combination with the water. A considerable quantity of this gas, however, appears to be united by a stronger chemical affinity, and will remain in the water some hours after it is poured out. This gas, acting as a solvent of all the different earths, and various other substances, gives to the soda-water a more diluent and deobstruent efficacy, than is possessed by common water; and to this cause we may ascribe the good effects of soda-water in removing bile and calculary concretions. The carbonic acid, in its concentrated state, as it exists in soda-water, is a more powerful solvent of metallic substances than is generally supposed. On which account the manufacture of soda-water, in vessels of copper, or other metals, ought carefully to be avoided, and too great caution cannot be observed by those who are in the habit of drinking

drinking foda-water, to have it free from any metallic impregnation, or improper admixture.

SODALITE. See MINERALOGY, *Addenda*.

SOMERSET, l. 6, r. 14, 725.

SOONTAARS, a wild and unlettered tribe of Hindoos, who inhabit the district of Ramgur, the least civilized part of the Company's possessions, and who have reduced the detection and trial of persons suspected of witchcraft to a system. For an account of their practices, we refer to the fourth volume of the Asiatic Researches, p. 343. See BENARES.

SORBIC ACID, in *Chemistry*. This acid was so named by Mr. Donovan its discoverer, because obtained from the berries of the *mountain ash* (formerly denominated *forbus aucuparia*, but now *pyrus aucuparia*). The juice of the ripe berries is to be strained and mixed with a filtered solution of acetate of lead. The precipitate is then to be separated by a filter, and washed in cold water. A large quantity of boiling water is then to be poured upon the filter, and allowed to pass through the precipitate into jars. After some hours this liquid becomes opaque, and deposits crystals of great lustre and beauty. These crystals are to be boiled for half an hour with 2.3 times their weight of sulphuric acid, specific gravity 1.090, supplying water as fast as it evaporates, and taking care to keep the mixture constantly stirred. While still hot a stream of sulphuretted hydrogen is to be sent through the resulting liquid, which will precipitate the lead, and leave the sorbic acid in solution in the water.

Sorbic acid thus obtained is a transparent colourless inodorous fluid, soluble in alcohol, and in any portion of water. It does not crystallize, nor is it volatile. Its taste is exceedingly acid, and it does not appear to undergo much change when kept.

The *forbates* of potash, foda, and ammonia, are crystallizable salts, containing an excess of acid. They are soluble in water, but not in alcohol. The *forbates* of barytes and lime are neutral and white insoluble powders. The sorbic acid combines with lead in three proportions. The *subforbate* is a hard mass or a gritty powder. The *forbate* is a white powder, which by solution in sorbic acid may be obtained crystallized in beautiful silvery crystals. The *superforbate* has a sweet taste, and is soluble in water. The other *forbates* are little known, and do not seem to be very interesting.

There appears to be a great resemblance between the *forbic* and *malic* acids. Indeed it has been asserted that they are identical. The *malic* acid having recently been obtained in a more pure state than formerly, has enabled chemists to investigate its properties more completely, and in this pure state it is said in no circumstance to differ from *forbic* acid.

SOSOS, a Chaldean period of 60 years, which doubled gave the return of the lunar months to within the 20th part of a month. By multiplying this cycle as many times as are necessary to obtain the precise returns of the sun and moon to the same points of the heavens, astronomers found a period of 600 years, called the *Neros*; which see.

SOUND, for Roberts *r.* Robarts.

SOUTHAMPTON, in *Geography*, a township of Cumberland county, in Pennsylvania, having 700 inhabitants.

SOUTH-END. In 1811, the parish of Prittlewell with Milton contained 285 houses, and 1541 persons; 759 being males, and 782 females.

SOUTHWARD, EAST, a township of Pennsylvania, in Philadelphia county, having 726 inhabitants.

SOUTHWARK BRIDGE, an elegant structure designed by Mr. Rennie, and forming a communication between the city

of London and the borough of Southwark, in nearly a straight line between Guildhall and the Bank-side. It consists of three grand arches; the centre arch being 240 feet in span, and each of the side arches being 210 feet. The arches are composed of cast-iron, and the piers and abutments of stone. The estimate of the expence was 287,000*l.*, and that of the tolls, on the supposition that London bridge should be rebuilt, was conjectured to amount annually to 50 or 60,000*l.* The first stone of this bridge was laid in 1815, and it was opened for passengers and carriages in February 1819.

SOWANS, a nutritious article of food prepared in Scotland from the hulks of oats, by a process not unlike that by which common starch is made. The hulk of the oat after having been separated by the sieve still retains a considerable portion of farinaceous matter. It is mixed with water, and allowed to remain till the water becomes sour. The whole is then thrown upon a sieve; the milky water passes through loaded with starchy matter, which soon subsides. The four liquor is poured off, and about an equal quantity of fresh water added. This mixture when boiled forms a very nourishing article of food, and the portion of the four water which still adheres to the starch gives the whole a pleasant acidity.

SPANGLES, *paillettes*, Fr. are small thin round leaves of metal, pierced in the middle, which are sewed on garments, &c. as ornaments. They are prepared by first twirling wire round a rod into the form of a screw; this is then cut into single spiral rings, like those used by pin-makers in forming heads to their pins; and these rings being placed upon a smooth anvil are flattened by a smart stroke of the hammer, so that a small hole remains in the middle, and the ends of the wire which lie over each other are closely united.

The smaller spangles were first made in the French gold and silver manufactories, and imitated in Germany, for the first time, in the beginning of the 18th century. Beckmann's *Hist. of Inventions*, vol. ii.

SPARROW, in *Agriculture*. Add—It has been suggested, however, that the mischief done by sparrows may be fully compensated by their usefulness in destroying caterpillars; a single pair has been found to consume 40,000 in one season, in feeding their young. We may here add, that in a district in which great pains had been taken to extirpate the moles every vegetable was for a considerable time destroyed by cockchafers, which grubs had been thus preserved by the short-sighted policy of the farmers.

SPARTA, l. 13, for country *r.* city.

SPARTA, col. 2, l. 3, containing 179 inhabitants.

SPAVIN. Add—In healing the blood spavin, Mr. Denny recommends repeated blistering, and afterwards a compress of folded linen, moistened in the following lotion, and confined by a long bandage: Take 4 oz. of fal ammoniac, 2 oz. of acetated ceruse, 2 quarts of vinegar, and 4 of water, mix them. The usual method of treating the bone spavin is by blistering and firing.

SPECULUM, col. 15, l. 23 from bottom, for cord *r.* card.

SPEECH. See LARYNX.

SPERMACETI, *Chemical Properties of*. See CETIC ACID.

SPERMADICTYON, in *Botany*, from $\sigma\pi\epsilon\mu\alpha\zeta$, *seed*, and $\delta\iota\kappa\tau\omicron\nu\varsigma$, *a net*, because of the reticulated tunic of the seeds.—Roxb. *Coromand.* v. 3. 32.—Class and order, *Pentandria Monogynia*. Nat. Ord. *Rubiaceae*, Juss.

Ess. Ch. Corolla funnel-shaped. Calyx in five deep awl-shaped segments, permanent. Stigma five-cleft. Capsule inferior, of one cell and five valves. Seeds five, each in a latticed tunic.

1. *S. suaveolens*,

1. *S. suaveolens*. Fragrant Net-feed.—Discovered by Mr. William Roxburgh, on the Rajamah hills. Stem erect, shrubby, with opposite branches; downy when young. Leaves opposite, stalked, with triangular intermediate stipules, lanceolate, acute, entire, near a span long, smooth. Flowers white, an inch long, delightfully fragrant, copious, in numerous terminal tufts. A very curious and distinct genus, which we hope to see introduced from the Calcutta garden into the stoves of England.

SPHAGEBRANCHUS. See SYNBRANCHIUS.

SPRIGE, or SPRIGG.

SPRINGS. Add—See UXAHVER.

STAMMERING. See LARYNX.

STAPHYLINUS, l. 5, add—The larvæ are subterraneous, and much resemble the complete animals; l. 15, add—Mr. Marham, in his "Entomologia Britannica," enumerates no fewer than 87 British species.

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STARCH, *Chemical Composition of*. Starch has been analysed by three different experimentalists. The following were the results:

	Gay Lussie and Thenard.	T. de Sauffure.	Berzelius.
Hydrogen	- 6.77 -	- 5.90 -	- 7.066
Carbon	- 43.55 -	- 45.39 -	- 43.481
Oxygen	- 49.68 -	- 48.31 -	- 49.453
Azote		0.40	
	100.	100.	100.

Berzelius employed potatoe starch. The other experiments were made with the starch of wheat.

Kirchhoff, a Russian chemist, found, that by boiling starch with dilute sulphuric acid it is converted into fugar; and M. T. de Sauffure has recently discovered, that this change takes place spontaneously when boiled starch is exposed for a considerable length of time to the action of the air.

STATISTICS, a term applied to the topography of a country, and comprehending its population, policy, manufactures, trade, and a variety of other circumstances.

STEARIN, in *Chemistry*. A name given by Chevreul to a substance existing in animal tallows or fats. It may be separated by alcohol, or simply by pressure. Braconnot used the following method: The oil if fluid was congealed, and in this state was subjected to strong pressure between folds of blotting paper. The elain (see ELAIN) was imbibed by the paper while the stearin remained behind in a solid state.

Stearin thus obtained is white, brittle, and something like wax in appearance. It crystallizes in small needles. It has little or no smell. It is tasteless, and produces no effect on vegetable blues. It melts, as obtained from different fats, between 109° and 120°; that from the fat of the duck being most readily melted, and that from human fat the least. It is soluble in water, and combines with the alkalis, forming soaps.

STEBEN, l. 15, add—of whom, in 1810, 87 were slaves.

STIPPLING, l. 7 and 9, *r.* pecks.

STIRLINGSHIRE. In 1811, this shire contained 8910 houses, besides 55 unfinished, and 58,174 persons (including 803 local militia); 27,745 being males (militia in-

cluded), and 30,429 females: 2425 families being employed in agriculture, and 5912 in trade, manufactures, and handicraft.

STIRRUP. At the clove, add—The Roman manners required that young men and expert riders should be able to vault on horseback without any assistance. (Virgil, *Æneid*, l. 12. 288.) In many public places, particularly highways, stones were erected, to which a rider could lead his horse, that he might mount with greater facility. Such stones Gracchus caused to be raised (Plutarch, de Vit. Gracchi); and they were to be found in many cities in the 16th century, especially near the council-house, for the convenience of the members of the council, who at that time did not ride in coaches. It was usual also to have portable stools, which were placed close to the horse when persons wished to mount: and this gave rise to the barbarous practice of making conquered generals and prisoners stoop down, that the victor might more easily get on horseback, by stepping upon their backs as upon a stool. In this ignominious manner was the emperor Valerian treated by Sapor, king of Persia. Some horses were so taught, that they kneeled until the rider mounted; and warriors had on their spears or lances a step or projection on which they could rest the foot until they got on horseback. (Strabo, lib. iii. Sil. Ital. lib. x.) See ANABATHRA and ANABOLEUS. The first certain account of stirrups, says Beckmann, (History of Inventions, vol. ii.) is in a book written by Mauritius, respecting the art of wars, about the end of the 6th century. Euthathius, the commentator on Homer, informs us, that in his time, *i. e.* the 12th century, stirrups had not become very common; but on a piece of tapestry, of the eleventh century, caused to be engraven by Montfaucon, the saddles of all the horses appear to have stirrups. However, after they became common, it was thought to be an evidence of superior dexterity to ride without them.

STOKES, in *Geography*, a township of Madison county, in Ohio, containing 267 inhabitants.

STONE in the *Bladder*. See LITHIOMY, and URINARY Calculi.

STONE, *Mile*. See MILE-Stone.

STONES, *Chemical Analysis of*. See ANALYSIS.

STONY CREEK, in *Geography*, a township of Somerset county, in Pennsylvania, having 943 inhabitants.

STRAFFORD, in New Hampshire, add—divided into 31 townships, &c.

STRAINING. See LUNGS.

STRAND BRIDGE. See WATERLOO.

STRONTIAN, STRONTIUM, in *Chemistry*, the name of an elementary substance or earth, the description of which has been omitted.

Strontian is always found in nature combined with the carbonic or sulphuric acids. (See STRONTIANITE and CELESTINE.) It may be obtained pure from those minerals precisely in the same manner as barytes and lime.

Strontian thus obtained is in porous masses of a greyish-white colour. Its taste is acrid and alkaline, and it converts vegetable blues to green. Its sp. gr. according to Haffenratz, is 1.647. It does not act so strongly on animal bodies as barytes, nor is it poisonous.

Sir H. Davy, led by analogy, subjected it to galvanic influence, and thus succeeded in separating its oxygen and obtaining *strontium*, the metallic basis of strontian. This metal is white, much heavier than water, and bears a close resemblance to *barium* in its properties: when exposed to air or thrown into water, it rapidly absorbs oxygen, and is converted into strontian.

Dr. Thomson, from the recent experiments of Stromeyer and

and others, fixes the weight of the atom of strontian at 65; from which the composition of its salts may be readily estimated.

The salts of strontian require to be briefly noticed. They are in general more soluble than the salts of barytes, but less so than the salts of lime. Most of them are capable of being crystallized. They are precipitated by the sulphates, phosphates, and oxalates. Succinate of ammonia precipitates barytes, but not strontian. When a piece of paper is dipped into a solution of a salt of strontian, it burns with a red flame. The salts of strontian are not precipitated by the prussiate of potash, nor are they poisonous.

Nitrate of Strontian.—This salt crystallizes in six-sided pyramidal dodecahedrons with their apex truncated, so as to have the appearance of hexahedral plates with bevelled edges. Sometimes in eight-sided prisms. It is perfectly transparent. It has a strong pungent cooling taste. Its sp. gr. is 3.006. It is soluble in its own weight of water at 60°, and in little more than half its weight of boiling water. It is insoluble in alcohol. It is not altered by exposure to air. It deflagrates on hot coals. When a crystal of nitrate of strontian is put into the wick of a candle, it communicates a beautiful purple flame.

Muriate of Strontian.—This salt crystallizes in long slender hexagonal prisms. Its taste is sharp and penetrating. Its sp. gr. is 1.4402. It is soluble in less than its weight of cold water, and in any quantity in boiling water. It is soluble in about twenty-four parts of cold alcohol. The crystals do not deliquesce on exposure to the air, except in very damp weather.

Carbonate of Strontian.—This, when precipitated, is a white powder without taste or smell, and soluble in about 1536 parts of boiling water. Its sp. gr. is about 3.66, and it is not altered by exposure to the air.

Sulphate of Strontian.—This salt is tasteless, soluble in 3840 parts of boiling water; readily soluble in sulphuric acid when assisted by heat, and possesses other properties very analogous to the sulphate of barytes.

Phosphate of Strontian.—This salt is likewise tasteless, insoluble in water, and not altered by exposure to the air.

Acetate of Strontian.—This is soluble in little more than twice its weight both of cold and hot water. It may be crystallized, and the crystals are not altered by exposure to the air. It renders vegetable colours green.

The other salts of strontian do not in general possess any remarkable properties. The *oxalate, tartrate, succinate, and citrate* of strontian, are all more or less soluble in water; the *oxalate* being the least soluble, and the *citrate* the most. The *malate* of strontian is more soluble in water than the *malate* of barytes.

STROUD, in *Geography*, a parish of Kent, part of which is included within the jurisdiction of the city of Rochester (see ROCHESTER); and the other part, in 1811, contained 242 houses, and 1394 persons; 718 being males, and 676 females.

STYLE, in *Painting*, is the manner in which a painter conceives and executes the subjects he adopts; or, in other words, in which he combines the various qualities of a picture. Style is properly divisible into four distinct kinds, *viz.* the grand or sublime, the beautiful, the natural, and the mean. There are indeed several varieties of style which have obtained specific appellations; but they will be found upon examination to combine, in different ways, the qualities peculiar to those above-mentioned; and are justly regarded as vicious in their nature: such are the ornamental and the artificial styles of art, which divert the attention of painters from the more pure application and exercise of their art, and

lead them to adopt fictitious means of attracting attention, by contrail and affectation, by glitter, and an idle display of skill in workmanship, to the neglect of nature and just expression, and sometimes even of common sense.

The object and aim of the grand style is to captivate the imagination. It is the only proper one for the representation of grand and elevated ideas: of subjects which represent the actions of deities, or of heroes, or which relate to the higher qualities of the mind of man: the only just medium whereby the art of painting can embody such ideas as the cultivation of those qualities inspires, and by which alone it can at all pretend to rival the grandeur and effect of heroic poetry. Its characteristics are simplicity and fulness of form and colour; and it is obtained, by adopting only essential parts, avoiding those which add nothing to specific character, and fixing solely upon those general forms which particularly distinguish one race of beings, or one class of natural objects or of actions from another, giving them their greatest possible degree of elevation, even to the verge of extravagance, in undulation of line, and fulness of form. This selection of form and of action requires an appropriate chiaro-oscuro, arranged and combined in broad and simple masses, and painted with a serious tone of colour; in fact, such a combination of the prime qualities of the art, as will most effectually unite in the production of one unmingled emotion.

The grand style does not admit attempts at illusion, or too close an imitation of natural objects; which, when carried to excess, necessarily disturbs that singleness or simplicity of effect required where the object is to produce an elevated tone of thinking. It is not dependent upon size, but may be exhibited on a small scale as effectually as on a large one: witness many of the beautiful bronzes and gems of the ancients, and the effect, as described by Statius, of the statue of Hercules made by Lyfippus, which "though not more than a foot in height, filled the imagination in a manner equal to the Hercules Farnese." Raphael's small picture of the vision of Ezekiel is also an effective instance of the truth of this assertion.

STYLE, for that word alone is adopted as significant of the grand in art, can only be acquired by those who have made themselves well acquainted with the just proportions and varieties of nature. Its aim being to represent her works with the greatest degree of sublimity commixed with truth, all attempts to produce it without real knowledge must necessarily lead to error, and a species of bombast, instead of expression, yields only deformity. Of this, the works of Gottzius, of Spranger, and the Germans who followed them, are sufficient evidence. And yet such is the rarity of perfection in form among the human or the animal race of beings, that an artist whose aim is to produce grandeur of style must draw largely upon his imagination; and while he touches the verge of impossibility, will find that the difficulty he has to overcome is in uniting the principle on which he depends with propriety. Even Michael Angelo, great and glorious as he was among those who have made it their principal object, has not unfrequently allowed himself to be misled by the wish to aggrandise, and give his contours only redundancy for style; and for the sake of a flowing and varied line, has sometimes given forms of action to muscles which ought to have been represented tranquil.

Of this style, as far as relates to form, the best among the sculptures of the ancients afford the fairest examples, particularly the torso of the Belvidere, the head of Jupiter, the Laocoon, the Apollo, the figures on Monte Cavallo, &c. &c.; and it is a striking feature in the works of Phidias,

dias, though with a chastened impulse, as may be seen in the Elgin marbles. Indeed it appears to have been so perfectly understood among the artists of ancient Greece, that it spread generally in a greater or less degree through all their productions, at least in those of sculpture; and from the few remains of painting left to us, it appears not improbable that the professors of that art were no less masters of its principles. In latter times, among the moderns, the Florentine school made it their principal object of attention; and in the works of Leonardo da Vinci, Fra. Bartolomeo, and more particularly of Michael Angelo, it reached in quality nearly to a level with the taste of those from whom it was adopted. Raphael attempted it in imitation of M. Angelo, and sometimes succeeded, but it evidently was not congenial to his feeling, which inclined to the beautiful and graceful, more than to the sublime; and hence it is that his pictures of the Godhead rarely impress us with sentiments of an exalted nature.

The beautiful style differs from the grand, in that it requires less force of contrast in form and action, and greater softness of colour and effect. Whatever is graceful and animated, void of superfluous parts, and yet essentially characteristic and pleasing in arrangement, combines to form the beautiful. Flowing lines, graceful contrasts, both in form and colour, softened lights and shades, and rich and harmonious colouring, are its principles: on them it depends, and every departure from them necessarily diminishes its quality. It is the fit medium for every subject whose character is adapted to afford pleasure.

As the grand style consists in an elevated view of nature, a conception of perfection almost super-human, built upon the possibilities of creative power, acting upon known and natural forms; so the beautiful also must be sought in the regions of imagination, guided by the knowledge of existing objects, and supported by selection from the varieties of nature. Therefore, in order to comprehend the character of beauty as applied to art, we must consider the perfection of that art, not as consisting in mere imitation of visible objects, but as requiring a separation and choice of parts, an ideal perfection, which, though it belongs to the works of nature in all classes of beings, yet is not to be found entire in any given object. Raphael, when he was painting his Galatea, said in a letter to his patron count Baldassare Castiglione, "that not being able to find perfect beauty upon earth, he was obliged to have recourse to ideal excellence framed in his own mind." But Zeuxis took another method to produce the constellation of perfections recognized in his Helen; viz. by selecting and combining the various beauties of the most beautiful among the virgins of Agriguntum: thus surpassing the works of nature, with materials furnished by herself.

Beauty, it will be easily conceived, is not confined to one given line, or set of lines or colours, in unison or in contact with each other. There is necessarily one general form of the male among men and animals, and one of the female; distinct in their character, and yet each having its appropriate degree of beauty: so there is also a distinction of form among different creatures of the same species. Apollo, Hercules, and a Gladiator, have each distinct qualities which must be maintained in their representatives, whilst grace and beauty are given to their forms and actions: and it would be as great an absurdity to soften each to the merely beautiful, and thus render them similar in form and character; as it is ignorant and gross to trust to that which is characteristic alone for a graceful and agreeable effect.

Though these, which we have specified, be the distinct separations between the grand and the beautiful styles in art,
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yet either may be rendered more perfect by the addition of the other; and when expression is superadded, then is exhibited the most perfect display of the power of art: and it is this union of the beautiful and characteristic with the grand, which constitutes that mental and energetic application of the art of painting which elevates it above the mechanical arts, and entitles it to the highest pretensions, as it is addressed to the noblest faculties. This is that beau-ideal so much the theme of praise and exultation among the connoisseurs; so universally felt when exhibited, so little understood, and so often the foundation of the grossest follies and deceptions among both artists and amateurs. The former, pursuing the practice of it in theory, often become the dupes of their own imaginary systems; the latter more often impose themselves upon the world as men of worth by the mere cant of its diction, and are screened from discovery by the general want of information concerning the principles and proper objects of art.

In this happy combination of beauty and grandeur the Greeks still remain unrivalled, as far as relates to sculpture, and perhaps single figures in pictures, but we have very little ground for conjecture how far they were able to conduct the principle in extended compositions in painting. Among the moderns, perhaps Parmeggiano in his latter and more perfect works, as his Moses and his Vision of St. Jerome, has effected more than any other painter this desirable union; and most likely had he lived much longer the world would have seen the perfection of the art from his hands; more particularly if he had cultivated expression in the school of Raphael, as successfully as he had the other branches of the art in those of Correggio and M. Angelo. "The name of Correggio," says Mr. Fuseli, "is the synonyme of whatever is graceful and agreeable in painting;" to him we are principally indebted for chiaro-oscuro, and that luminous and harmonious tone of colour, which fascinates and delights the eye by its unity, blended with richness and variety. He may be regarded as the father of the beautiful in modern art, as M. Angelo is of the grand and sublime.

That kind of style which is termed natural is, as its name imports, a mere imitation of the common forms of nature, without that selection which we have pointed out as necessary to the higher styles of art. Of this we have many capital instances among the smaller antique bronzes of Fauns, Nymphs, &c. and in many of the works of Titian in his second manner. Most of the principal portrait painters have almost necessarily adopted it, though that branch of the art admits, when highly practised, of that selection of parts which constitutes the beautiful, and of being treated with dignity and even sublimity, as many of the works of Sir Joshua Reynolds, of Titian, and of Vandyke, sufficiently prove. In a lower degree, the Dutch and Flemish masters have most successfully wrought in this style, as Jan. Steen, Ostade, Teniers, Rembrandt, Metz, Terburg, &c. and compensated for the want of higher qualities, by the perfection of their arrangements and execution, and the exactness of their imitations.

Of what is mean in style, it is hardly necessary to speak: examples of it may be found in all early essays; but in none more abundantly than among the works of the artists of the German and Flemish schools of the 16th century. Even in those of Albert Durer, meanness is a never-failing alloy, amidst all the brilliancy of imagination, and activity of mind, they display; deforming actions and expressions otherwise well worthy of esteem, and extending through every part of the compositions, be it of figures, drapery, or back-ground.

Of the four species of style above enumerated, all others
40 are

are necessarily composed : but there have been some few remarkable aberrations from the ordinary course of art, by painters of uncommon talent, which bid defiance to all classification, and stand alone in their respective spheres. Such are those of Rubens and Rembrandt, of Tintoretto and Salvator Rosa, compounds of all that elevates and degrades ; in which the grand and the mean, the beautiful, the natural, and the deformed, go hand in hand ; the evil counterpoised by the good, and the whole rendered engaging, in spite of defects, by the skilful display of the master hand which wielded the materials. Such examples, great though they are, ought not to serve as excuses for inattention to settled principles. Who shall say, that if Rubens had been more correct in form, his works would have been less engaging ; or, that if Tintoretto had been more pure and true in expression, his productions would not have been more interesting. (See the article PICTURE.) Combinations which will justify such expectations have been formed, and we have seen them in our own great Sir Joshua's productions, where fine form, rich and full-toned colour, and just chiaro-oscuro, have been blended in skilful and free execution.

SUCCOWIA, in *Botany*, in honour of professor Suckow, a learned botanist, of Heidelberg.—“ Moench. Meth. 265.” Brown in Ait. Hort. Kew. v. 4. 79.—Class and order, *Tetradynamia Siliculosa*. Nat. Ord. *Siliquosa*, Linn. *Crucifera*, Juss.

Eff. Ch. Pouch nearly globular, beaked with the awl-shaped style ; valves hemispherical, prickly ; cells single-seeded. Cotyledons folded together.

1. *S. balearica*. Minorca Succowia. Ait. n. 1. (Bunias balearica ; Linn. Syst. Nat. ed. 12. v. 2. 446. Mant. 429. Jacq. Hort. Vind. v. 2. 68. t. 144.)—Native of Minorca. Given to Kew garden, in 1781, by Dr. Brouffonet. A hardy annual, flowering in summer. *Stem* branched, a foot high. *Leaves* smooth, elegantly pinnate and lobed. *Flowers* yellow, racemose.

SUFFOLK, col. 6, l. 13, add—In 1811 Suffolk contained 37,227 houses, besides 155 then unfinished, and 234,211 persons ; viz. 111,988 males, and 122,223 females : 26,406 families being employed in agriculture, and 15,180 in trade, manufactures, or handicraft.

SUGAR, *Chemical Composition of*. See FERMENTATION.

SUGAR-Loaf, in *Geography*, a township of Luzerne county, in Pennsylvania, having 282 inhabitants.

SULLIVAN, l. 26, insert—including 43 slaves in 1810.

SULPHUR, in *Chemistry*. According to the most recent determinations, the weight of the atom of sulphur is 20, and of sulphuric acid 50 ; from which data the composition of the compounds of this substance can be accurately ascertained. See ATOMIC Theory.

SULPHUR Island, l. 8, add—The sulphur is collected by a few individuals resident on the island solely for that purpose ; sent to the Great Loo-choo, and thence exported to Japan and China. N. lat. 27° 56'. E. long. 128° 11'. Ellis's Journal of an Embassy to China. 1818.

SULPHURETTED CHYAZIC Acid. See CYANOGEN.

SULPHURIC ACID. It is stated in our article on this subject, that sulphuric acid cannot exist without water ; and that the sulphuric acid prepared at Nordhausen from green vitriol probably differs from common sulphuric acid by containing less water. The fact is, according to Dr. Thomson, that the latter, when most concentrated, contains *no water*

whatever, and consequently a perfectly anhydrous sulphuric acid can exist.

SULPHURIZED MURIATIC Acid, in *Chemistry*. The substance described under this name in the Cyclopaedia is a chloride of sulphur. See CHLORINE. See also the original article SULPHUR.

SULTANABAD. For TARSHISH *r.* TURSHISH.

SURABHI, col. 2, l. 44, for prescribe *r.* prescribe.

SURRY, in Virginia, l. 4, *r.* 6855.

SURYA, col. 5, l. 24, for drawn *r.* driven.

SUTTEE, l. 3 and 4 from bottom, *r.* thus—out number. As well as meritorious suffering for religion's sake, suicide is in some cases legal, and even commendable.

SUTTON, a village and parish of Surry, in the second division of Wallington hundred, which in 1811 contained 121 houses, and 638 persons ; viz. 310 males, and 328 females.

SWADHA, l. 5, for Galaka *r.* Golaka.

SWIMMING Bladders of Fish, *Nature of the Air contained in*. We may introduce here the curious experiments made by Biot on this subject. This gentleman and Mr. Laroche found in general a mixture of azote and oxygen, but no hydrogen or carbonic acid in the swimming bladders of fish ; the air-bladders of those fish living near the surface of the water containing least oxygen, and those of fish brought from a great depth the most. The following table exhibits the proportion of oxygen in 100 parts of the air in the different fish examined.

Names of Fish.	Proportion of Oxygen.
Mugil cephalus (Linn.)	Quantity insensible.
Ditto	do.
Murenophis helena (Lacepede)	very little.
Sparus annularis (Linn.), female	.09
Ditto, male	.08
Sparus fargus (Linn.), female	.09
Ditto, male	.20
Holocentrus marinus (Lacepede)	.12
Labrus turdus (Linn.)	.16
Sparus melanurus (Linn.)	.20
Labrus turdus (Var. Linn.)	.24
Sciæna nigra, female	.27
Ditto, male	.25
Labrus turdus (Linn.), female	.24
Ditto, male	.28
Sparus dentex (Linn.), female	.40
Sphyræna spet. (Lacepede)	.44
Sparus argenteus	.50
Sparus erythrinus	much.
Holocentrus gigas	.69
Gadus merluccius (Linn.)	.79
Trigla lyra (Linn.)	.87

The depth at which the fish in the preceding table are caught increases gradually, as well as the proportion of oxygen, from the beginning to the end of the table. The trigla lyra is always caught at a very great depth. M. Laroche found, that fishes taken at a depth greater than 150 feet, furnished at a mean about .70 oxygen, while the mean result furnished by the fish caught at less depths was only .29. The same law holds with respect to fresh-water fish. M. Biot's experiments were made near the Balearic islands.

SYCAMORE, in *Geography*, a township of Hamilton county, in Ohio, containing 1552 inhabitants.

SYMPATHY. See MENTAL PHILOSOPHY.

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TAIGAREE, for TEGERLY *r.* TEGERHY.
TALBOT. Add—of whom 4878 were slaves in 1810.

TAMUL, the name of an Indian language, which is spoken in the tract extending to the south of the Telinga, as far as Cape Comorin, and from the sea to the great range of hills, including the greater part of the Barbamakal and Salem, and the country now called Coimbetore, and formerly Kangiam, along which line it is bounded to the W. by the Canara and Malabar. In the northern part of Myfore, this language is, at this day, named the Kangea; in the central portion of Myfore it is named the Drauvader, and further N. the Aravee.

TAMWORTH, *l. ult. r.* Stafford county.

TANACETUM, in *Gardening*, col. 2, l. 22, add—Dr. Withering says, that the Finlanders obtain a green dye from this plant.

TANK, a term used in India for a pool or reservoir.

TAO-TSE, a term which denominates one of the two religious sects in China; the other being distinguished by the appellation of Fo. The sect of Tao-tse is said to have been founded about 600 years before the Christian era by Laokium in the Tcheou dynasty, and to have been more philosophical than religious. In the Koong-foo, or postures of the Tao-tse, and their supposed influences upon diseases, may be traced a practice somewhat analogous to animal magnetism. See *Religion of CHINA*.

TAPAS, col. 2, l. 11, for inflexions *r.* inflictions.

TAPIOCA. See CASSAVA and JATROPHA.

TAPIOCA, *Chemical Properties of.* See CASSAVA.

TARTARIC ACID, *Chemical Composition of.* This acid has been lately analysed by Gay Lussac and Thenard, and also by Berzelius. The following are the results of these chemists.

	Gay Lussac and Thenard.	Berzelius.
Hydrogen - -	6.629	3.951
Carbon - - -	24.050	36.167
Oxygen - - -	69.321	59.882
	<hr/>	<hr/>
	100	100
	<hr/>	<hr/>

TATE, in *Geography*, a township of Clermont county, in Ohio, having 969 inhabitants.

TATNALL. Add—The number of inhabitants in 1810 was 2206, of whom 542 were slaves.

TAUNTON, l. 3, add—in Britton county, containing 3907 inhabitants.

TAYLOR, HENRY, l. 23, for rector *r.* vicar; for Rotherhithe *r.* Reading; l. 24, for four *r.* eight; for two *r.*

T E L

three. Col. 2, l. 9, for Discourse *r.* Dialogue; l. 10, *r.* 1777.

TAZWELL, in *Geography*, a county of Virginia, containing 3907 inhabitants, of whom 328 were slaves in 1810.

TCHUKOTSKIIJA. Add—See CHUKOTSKIIJA.

TEGERHY, *r.* TAIGAREE.

TELESCOPE, p. 5, col. 1, l. 9, for *Plate XXIV. r. Plate XXVIII.* P. 20, col. 2, l. 27, for I E M *r.* I F M. P. 27, col. 1, l. 6, 8, 15, and 23, for 1.3827 *r.* 1.3287; l. 23, for 12.61 *r.* 12.17774. P. 39, col. 1, l. 15 from bottom, for convex *r.* concave, and let the whole sentence stand thus: *viz.* "To effect this improvement, the concave lens, with equal disperseive power to that of rock-crystal, must be at one side of the concave of flint, and the convex of crown glass must be at the other side. P. 55,

col. 1, l. 25, for $\frac{120 \times 46'}{68' - 48'}$ *r.* $\frac{120 \times 46'}{68' - 46'}$.

TELFAIR, in *Geography*, a county of Georgia, containing by the census of 1810, 744 persons, of whom 218 were slaves.

TELINGA, formerly called the Kalinga, and by the Europeans Gentoo, an Indian language occupying the space to the E. of the Mahratta, from near Cicacole, its northern, to within a few miles of Pulicat, its southern boundary, with the intervention of a stripe of small dimension. This space was divided into the Andra and Kalinga countries; the former S., the latter N. of the river. At the period of the Mahometan conquest, the southern part of these united provinces seems to have been known to that people by the name of Telingana, and Warankul is the capital of the whole.

TELLURIUM, in *Chemistry*. Add—This metal has the property of combining with hydrogen, forming a gaseous compound, to which the name of *telluretted hydrogen gas* has been given. This compound was discovered by sir H. Davy, and its properties were afterwards investigated by Berzelius.

Telluretted hydrogen may be formed by mixing together oxyd of tellurium, potash, and charcoal, and exposing the mixture to the action of a red heat. It is then put into a retort, diluted sulphuric acid is poured on it, and the beak of the retort is plunged into a mercurial trough. A gas comes over, which may be collected in glass jars previously filled with mercury. This gas is transparent and colourless, and possesses the mechanical properties of common air. It has a strong peculiar smell, something like sulphuretted hydrogen. It burns with a blueish flame, and oxyd of tellurium is deposited. It is soluble in water, and gives that liquid a claret colour. Davy was not able to determine whether it reddens vegetable blues, but in other respects it possesses

possesses the properties of an acid, combining with alkalies, and precipitating most metallic solutions like sulphuretted hydrogen. Chlorine gas immediately decomposes it. The other properties of this gas have not been satisfactorily examined. From the experiments of Ritter, there appears to be a solid compound of tellurium and hydrogen.

Tellurium seems also to have the property of combining with carbon.

TEMPERATURE, col. 2, l. 28, *r.* eminence.

TERRITORY, MISSOURI, col. 2, l. 5, add.—It was first discovered by Sebastian Cabot in 1487, and in 1512 visited by John Pontio de Leon, a Spaniard, who endeavoured to form a settlement. In 1684 M. de la Sella, a Frenchman, discovered the mouth of the Mississippi, and built Fort Louis; but being assailed, it was again abandoned. In the year 1698, captain Ibberville sailed to the Mississippi, formed a settlement, and named the country Louisiana. About twenty-two years afterwards, M. de la Suiere also sailed up the Mississippi, and proceeded to the distance of 2280 miles from its mouth. In 1762 France ceded it to Spain: in 1800–1801 Spain ceded it back to France; and by a treaty of April 30th, 1803, the French government sold it to the United States for the sum of fifteen millions of dollars, payable in fifteen years at the rate of one million annually. Bradbury's Travels, p. 214.

TEST-ACT, col. 10, l. 4, for office *r.* offence.

TEUTATES. Add.—See DRUIDS.

TEUTHIS, HEPATUS, l. *penult.* *r.* Tang.

TEWKESBURY, in *Geography*, a town of Hunterdon county, in New Jersey, containing 1308 persons, of whom 66 were slaves in 1810.

THEOPHILANTHROPISTS, a sect which sprung up, flourished, and became extinct in France during the period of the Revolution. It has been said, that the "temple of nature," opened in Margaret-Street, London, in 1776, by the lately deceased David Williams, an active member, if not the founder of the society for the relief of decayed and indigent authors, for worship on Deistical principles, suggested to the unbelievers of France the idea of a ritual and liturgy of deism, which was first carried into execution in the year 1796. The resemblance of the principles of some members of the sect to those of Robespierre, and of its ceremonies to the worship of the goddesses of Reason, has led some persons to represent the Theophilanthropists as partisans of the tyrant, and their meetings as Jacobinical clubs; but the abbé Gregoire (*uli infra*) has laboured to vindicate them as a body from this charge. The first person who planned the celebration of the rites of natural religion appears to have been D'Aubermont, a romantic enthusiast, who wished to revive a part of the doctrines of the ancient Magi. In his work intitled "Culte des Adorateurs," which is a rubric, a liturgy, and a treatise of morals, eight days are appointed for labour, and the ninth for rest; but the temples were to be constantly open, and the sacred fire kept burning in them with the most religious care. The priests, whose costume was prescribed, were to offer to the Deity grain and fruits of different kinds, salt and oil, and, turning to the four cardinal points, to pour libations and make apostrophes to the elements. The twelve signs of the zodiac were to be painted on the walls of the temple, (or asylum, as it was denominated,) and under each thirty butterflies, to represent the number and shortness of our days. Sacred dances were to be performed at different periods; the elderly men leading off with the matrons, the young men and the virgins following. At funerals a libation was to be poured out to

the manes of the deceased, and the eldest of his relations was to throw water on the fire, addressing the element in a prepared formula. D'Aubermont proposed to denominate his followers "Théoanthropophiles," which appellation was afterwards changed to "Théophilantropes." As the churches had all become national property, the Theophilanthropists applied to the civil authorities for the use of them jointly with the Catholics; and their request was granted, on condition that each party should remove the emblems and decorations of its own worship, while that of the other was performed. We shall not detain our readers with describing their ritual, the drefs of their orators, or the circumstances attending their worship, and their marriage-service, nor shall we detail their moral lesson, or give specimens of their hymns and sacred poetry. This sect did not subsist for a long time; the zeal of its partisans began to decline in the provinces; and it appears, from the registers of a society at Bourges, that their first fitting was held in the cathedral, Feb. 29, 1798; and that on the 18th of August, 1800, their number being reduced to seven or eight, they dispersed, and the Theophilanthropic church of Bourges became extinct two years and a half after its first formation. In about five years, the whole sect had quietly disappeared; the last trace of it being that Chemin, who wrote a work defending their principles, made use of their manual as a school-book in a seminary at Paris, where he taught Latin. See Abbé Gregoire's *Histoire des Sectes Religieuses*, &c. 2 vols. 8vo. Paris.

THOMPSON'S POND, and *Shaker Settlement*, in *Geography*, a township of America, in the district of Maine, and county of Cumberland, having 191 inhabitants.

THORINA, in *Chemistry*. The name of an earth recently discovered in Sweden by Berzelius.

This celebrated chemist first detected thorina in the *Gadolinite* of Korarvet, and afterwards in the *deutofluate of cerium*, and the *double fluat of cerium and yttria*, both minerals found at Fahlun.

Thorina may be obtained from the minerals containing protoxyd of cerium and yttria in the following manner. Precipitate the iron by means of the fuccinate of ammonia. Thorina when alone is precipitated by this salt, but this is not the case when it is mixed with the other bodies that exist in the fluates of cerium and yttria. After the iron is removed, precipitate the cerium by means of sulphate of potash. Ammonia now precipitates the thorina mixed with yttria. Dissolve them in muriatic acid. Evaporate the solution to dryness, and pour boiling water on the residue, which will dissolve the greatest part of the yttria, but not the whole. Redissolve the residue in muriatic or nitric acid, and evaporate till it becomes as exactly neutral as possible. Then pour water upon it, and boil it for an instant, the thorina precipitates, and the solution contains a disengaged acid. If we saturate this acid, and boil it a second time, an additional portion of thorina is precipitated.

Thorina when separated by the filtre has the appearance of a gelatinous semi-transparent mass. When washed and dried it becomes white, absorbs carbonic acid, and dissolves with effervescence in acids. Though calcined it retains its white colour. After a violent heat it is difficultly soluble in muriatic acid. The solutions in this acid are yellowish, but become colourless when diluted.

The neutral solutions of thorina have a purely astringent taste, which is neither bitter, sweet, saline, nor metallic; a property in which it agrees with zirconia, and differs from all other earths.

Thorina is little soluble in the alkalies or alkaline earths.

It has not yet been reduced to the metallic state. It is infusible *per se* before the blow-pipe, but with borax it melts into a transparent glass. It differs from alumina by its insolubility in hydrate of potash; from yttria by its purely astringent taste without sweetness; and by the property its solutions possess of being precipitated by boiling, when they do not contain too great an excess of acid. It differs from zirconia by the following properties: 1. After being heated to redness, it is still capable of being dissolved in acids. 2. Sulphate of potash does not precipitate it from its solutions, while it precipitates zirconia from a solution containing even a considerable excess of acid. 3. It is precipitated by oxalate of ammonia, which is not the case with zirconia. Sulphate of thorina crystallizes readily, while sulphate of zirconia, supposing it free from alkali, forms when dried a gelatinous transparent mass, without any tendency to crystallization.

Thorina combines with the different acids. The sulphate of thorina is soluble, and yields transparent crystals, which are not altered by exposure to the air, and which have a styptic taste.

The nitrate and muriate of thorina do not crystallize. The carbonate of thorina is very readily formed, the earth having a very great affinity for this acid. None of the other salts of thorina known appear to be capable of crystallizing.

THORN, in *Geography*, a township of Fairfield, in Ohio, having 497 inhabitants.

THORNBURY, a township of Chester county, in Pennsylvania, having 200 inhabitants.

THORNTON, a town of Grafton county, in New Hampshire, containing 794 inhabitants.

THRIPS, col. 2, under VARIEGATA, l. 13, add—The Thrips phylaxus has been supposed to do much injury to wheat, rye, &c. by causing the young flowers to decay, and thus preventing the growth of the embryo grain. Some, however, have disputed this opinion, contending that the thrips does not attach itself to such of the cerealia as are in a perfectly healthy state, but rather to such as are diseased, by having the germina covered with the dust of a very minute fungus, often growing on wheat, &c. and belonging to the genus *Æcidium* or *Lycopodon*, and which appears in the form of a flattish, smooth, irregular exudation of a yellow colour in various parts of the plant. (See on this subject, vols. iii. iv. and v. of the Transactions of the Linnean Society.) The ingenious Mr. Kirby, however, seems convinced, that the thrips is in reality an insect highly injurious to corn, by deriving its nourishment from the embryo grain. Shaw's Zool. vol. vi.

TIC DOULEUREUX, in *Medicine*, an extremely painful disease of the nerves of the face, commonly, if not exclusively, affecting some branch of the fifth pair of nerves, and most frequently the infra-orbital branch, where it passes through the foramen, so named in the cheek.

The complaint commences with slight and almost imperceptible attacks of pain, and generally without any warning; though some patients feel in the affected part peculiar and inexplicable sensations preceding its approach, from which they announce with horror the coming enemy; the patient at the same time enjoying a good or an indifferent state of health. The pain, however, soon becomes most acute, shooting and darting along the various ramifications of the affected nerves. It generally continues from a quarter to half a minute, and never exceeds the space of one minute. It returns at intervals more or less frequent; there being sometimes several paroxysms in a few minutes,

and at other times there are intervals of from fifteen to thirty minutes, or longer. There is no determinate period; we always find the utmost irregularity even in the same patient.

The pains vary in their degree of intensity, at one time exciting the most piercing cries, and distracted writhings and motions in the miserable patient; while at another, they are more bearable. When at the acme of their violence, the parts affected are often convulsed, and sometimes various contortions and grimaces are observable. These are to be distinguished from the convulsive twitchings of the muscles, with which the diseased nerves communicate, and which are occasioned by irritation from the excessive pain; while the contortions and grimaces are voluntary, being caused by the patient's writhing and twisting from the agony of his torture, and may be prevented by a firm resolution to resist any impulse of shrinking from the attack.

The pain does not always confine itself to the seat of the disease, but darts with the rapidity of lightning to the neighbouring parts, shooting in different directions like radii from a centre. It rarely gives warning of its approach, and often the first sign of an attack, is the patient's starting up in a state little short of palsy. In this condition, some patients beat the part with violence, or forcibly rub it with some rough substance till excoriation takes place; and in some instances, they have succeeded in diminishing the intensity of the pain.

The pains are more frequent during the day than in the night, probably from there being fewer causes of irritation; and they are more frequent during conversation than in silence; and still more so, at the time of mastication, when the attacks often succeed each other with such rapidity as to appear like one continued paroxysm, with scarcely one interval of cessation. The eye at times is red, inflamed, and watery, as we sometimes observe in severe tooth-ach. In other cases, it is particularly dry, and in some patients a copious flow of saliva succeeds a paroxysm. In general, only one side of the face is affected with this dreadful malady. But as there are cases recorded in which both sides suffered at the same time, we cannot lay it down as a certain characteristic of the disease. Fouquet observed at Montpellier two women who had both cheeks affected at the same time; and Pujol knew a lady, who, for several months, had the pain in one cheek, which after a while was free from pain; but the other cheek was immediately attacked in the corresponding place, the pain continuing for two months, and then returning its former position.

When the disease continues for a great length of time with increasing violence, the patient can neither obtain rest by night nor by day. His appetite fails; and, as may be expected, there is some degree of feverishness. But this rarely happens, and only in cases of the utmost severity. The complaint usually terminates without any apparent cause, leaving the patient for a time to enjoy the comforts of life. But whoever has had one attack may with considerable certainty anticipate another; and though he is to-day well, and free from all pain, to-morrow's dawn may usher in a renewal of his torment. So varied is the duration of this affection, and so limited is our knowledge of it, that we can assign no determinate or even probable period for its continuance; and unless a cure is effected it returns at intervals more or less frequent, and with increased violence, till the great final catastrophe, which, however, it does not seem to accelerate. For though Dr. Banisch is said to have died of it, we can place little reliance on the report, and subsequent cases and observations do not corroborate such a supposition.

Hartenkeil,

TIC DOULEUREUX.

Hartenkeil, Hildebrande, and Baldinger, and some other Germans, relate cases of what they call tic douleureux; which, though in some particulars, they resemble that affection, in others differ most materially. The first of these writers describes it as having been very prevalent at Saltzburgh. But the pain was periodical, recurring generally once in twenty-four hours; and sometimes, though rarely, once in twelve hours; often remaining for several hours at a time, and then suddenly departing. These, however, were obviously cases of hemicrania; for that has, in many instances, been observed to attack the patients periodically, and to yield to bark. See HEMICRANIA.

The predisposing cause of this disease would seem to be a certain period of life, when the strength begins to fail, the functions to be impaired, and the whole corporeal frame to feel the first signs of approaching decay. We rarely find it commence before the fiftieth year, though two or three cases of an earlier date are recorded. Women do not seem to be more liable to the complaint than men; though Dr. Fothergill, having a great proportion of female patients, imagined they were more predisposed to it; as likewise did Pujol, from their greater sensibility. The latter author (in his Essay, p. 14.) says, "we generally observe in such people as are subject to tic douleureux an excess of mobility, which renders them more or less disposed to hysterical and hypochondriacal affections. Experience, however, teaches us, that people very far removed from excess of sensibility are equally liable to the disease; that women are not more liable to it than men; and that the predisposing period of life is that when the sensibility or mobility of fibre is most defective.

The exciting causes are, cold applied to the face in a stream, whether of air or of water; particularly when the patient is fatigued by previous exhaustion. Exposure then to stormy, damp, moist, windy, and tempestuous weather, frequently excites an attack; also external injuries, as blows or contusions on the face. Passions of the mind, as excess of anger or of grief.

The disease being once established in the system, the slightest causes in some individuals will bring on a paroxysm; such as eating, drinking, and talking, or indeed any motion of the facial muscles, or the gentlest touch with a handkerchief, or any other substance to the nose, lips, cheek, &c. of the affected side. Shaving is an operation most particularly shunned and dreaded by the unhappy patient; and often cannot be endured till after a considerable interval of ease. Blowing the nose is absolutely impracticable; or, if attempted, a most pungent and distracting torture attends the performance. M. André, in a work entitled "Observations sur les Maladies de l'Urètre," mentions a very obstinate case of tic douleureux, which he attempted to cure by destroying the nerve that he supposed to be the seat of the disease. He began by laying it bare, and was astonished to find, that every time he touched the denuded nerve, he immediately excited symptoms of the disorder; the paroxysm ceasing in the usual time, and recurring whenever the nerve was touched. This fact is very clear and decisive as to the part affected by the disease, and hence we readily perceive, why the least touch or motion on the surface of the skin produces a paroxysm.

When the pain has continued with frequent accessions for a length of time, a most distressing scene is sometimes witnessed. The patient, whose health at the time is generally good, after desisting from eating and drinking, till the keenness of his appetite, and the intensity of his thirst, are too irresistibly urgent to be longer unrelieved,

attacks whatever food is placed before him with maniac fury and hurried precipitancy; his countenance suffused with crimson, and convulsed and contorted with pain. This horrid conflict does not last long; he soon throws down his knife and fork with desperate violence, obliged to solicit a cessation of pain by a state of inaction.

Treatment of Tic Douleureux.—Of the inefficacy of most medicines in the cure of this cruel disease, we have abundant and melancholy proof. Those which have been said to procure ease are, opium, cicuta, zinc, stramonium, belladonna, argemone nitratum, and arsenic. But the instances in which a cure was effected by their use are very rare; indeed some practitioners, from painful experience, deny their efficacy altogether. All manner of topical applications, from blisters to the smoking entrails torn from living pigeons, have been in vain applied, and baths and bleeding of all sorts.

M. Watson, professor of chemistry in the central school of Vaucuse, relates two cases of tic douleureux arising from venereal causes. The first was of an officer in the French army, aged thirty; the other that of a lady, aged forty. They were both completely cured by a course of mercury. These cases, in some respects, differed from the tic douleureux, but had its most distinguishing characteristic darting pains in the direction of the nerves. We learn nothing more from them, however, than that, where the symptoms of the tic douleureux are excited by the existence of a venereal taint in the habit, they will depart when that taint is overcome by the action of mercury; but it is found from experience, that in ordinary cases, the symptoms are not in the least relieved by the use of mercury. Recourse has next been had to electricity, to magnetism, to actual cautery, and finally, to the section of the affected nerves. Electricity sometimes procures temporary ease, but as frequently increases the pain; though Mr. Blunt, in the Medical Journal, relates the case of a lady afflicted with tic douleureux being cured by electricity. The pain was chiefly seated in the right temple, and the symptoms are so well described as not to be disputed. She was electrified twice in the day for several minutes each time; first with sparks, then with shocks, after having previously endured a long and ineffectual course of powerful medicines. Immediately after the second application of electricity she ventured to eat, and performed that necessary operation without any inconvenience. The pains afterwards recurred very slightly; the electricity was continued; and in the course of a short time, she became entirely free from the complaint. The decided success of this, though a solitary case, in such a dreadful disease, authorises us to hope, that future trials may be made of the application of electricity, which under the direction of an able practitioner is often a very powerful instrument in the cure of disease, and much oftener fails from want of care and assiduity in the application, than from inefficiency in itself as an agent.

The mode of destroying the affected part of the nerves by caustic has been adopted by some practitioners, and said to be attended with success. But, till more experience has better established the utility of such a cruel operation, we cannot recommend its use; it has not been had recourse to in this country; and some cases are related in which it did not succeed, and others in which deformity of the face was the consequence. M. André, however, has tried it, and recommends its general use. In his work will be found an account of the method of operating.

The

The section of the affected nerve was thought of and tried many years ago in the cure of this disease; and of late years, from a temporary success, some practitioners have confidently asserted, that the cure was effectual and radical; but more recent experience has destroyed the validity of such assertions.

So long back as the year 1768, Veillard published a thesis, in which he decided this question in the negative. "Utrum in pertinaçibus capitis, facieque doloribus, aliquid prodesse possit sectio ramorum nervi quinti paris?" Now it is not likely, that he should have treated this important question superficially, but that he would rather collect all the information that at that time could be obtained upon the subject. He mentions two cases where the disease returned after the division of the nerves; and others, in which bad consequences ensued after the operation. Marechal, about the middle of last century, operated twice without success. Pujol was so convinced of its uncertainty, that he would not venture upon it. He has seen the muscles paralyzed, and the face distorted in consequence of the operation. Sabatier relates, that Ritah, surgeon to the king of Poland, performed the operation with success; but the patient, after being free from the complaint for some time, was again attacked with his former pains.

Modern practice seems also to confirm our scepticism in the permanent success of dividing the nerves. We see that what was at first supposed to be the most decisive case in its favour, the operation performed, and the account of it so ably recorded by Dr. Haighton, is now not to be relied upon. Mr. A. P. Cooper has frequently performed the operation with similar present success, but with what permanency time only can determine.

There is a case related by Darwin, in the *Zoonomia*, of a gentleman who first had the second branch of the fifth pair of nerves divided; then the first branch; and thirdly, the remaining third branch. But the patient was not yet relieved. He then had several incisions made across the side of the nose, and ossa nasi, through the masseter muscle to the jaw-bone, through the parotid gland. And lastly, some more twigs from the second branch of the fifth pair, passing into the cheek, and lying between the pterygoideus internus muscle, and the upper part of the lower jaw. These operations were performed by Mr. Cruikshank and Mr. Thomas. The patient, it seems, at length escaped alive and cured. De Haen has divided the suborbital nerve, as have also Moreau and Guerin, without any bad consequences. For the best method of operating, see Dr. Haighton's paper in the medical records.

It appears then, that as yet we know of no certain and radical cure for this painful affection. The section of the nerves promises the fairest; but when it is had recourse to, the patient should be warned of the possibility of the complaint returning, and not amused with the certainty of its being completely cured. Admitting, however, that the disease may return in the course of a few years, the operation is so simple, is attended with so little inconvenience or danger, and the relief in general so complete and instantaneous, that there can be little hesitation on the part of the practitioner in recommending its being performed, when the seat of the disease is accurately ascertained.

Lentin declares, he has had the misfortune to treat, in the course of twenty-seven years, fourteen patients attacked with this painful malady, without radically curing one; and calls upon all practitioners to make public any means they may have found to succeed, either in performing a complete cure, or even a partial relief of the symptoms. The

only remedies from which he experienced any good effects, were the tincture of thornapple, *Datura Stramonium* Linæi, and the sulphureous baths of Meudorf.

A French writer relates a method of taking nutriment for those patients who feel an appetite, but dare not indulge it, on account of the extreme pain; and that is, to suck through a small tube, as a quill, reed, &c. soup, broth, milk, or any nourishing fluid, so gently as not to excite any pain.

TIN-ORE. See COPPER, and MINERALOGY, *Ad-denda*.

TIN, CRYSTALLIZED, a kind of manufacture said to have been accidentally discovered in France by M. Baget, called metallic watering, or *moiré metallique*. It depends upon the action of acids, either pure or mixed together, and in different degrees of dilution, on alloys of tin. The variety of designs resembles mother-of-pearl, and reflects the light in the form of clouds. The process is this:—First, dissolve four ounces of muriate of soda in eight ounces of water, and add two ounces of nitric acid.—Second mixture; eight ounces of water, two ounces of nitric acid, and three ounces of muriatic acid.—Third mixture; eight ounces of water, two ounces of muriatic acid, and one ounce of sulphuric acid. One of these mixtures is to be poured warm upon a sheet of tinned iron, placed upon a vessel of stone-ware: it is to be poured on in separate portions, until the sheet is completely watered; it is then to be plunged into water, slightly acidulated, and washed. The watering obtained by the action of these different mixtures upon tinned iron, imitates very closely mother-of-pearl and its reflections; but the designs, although varied, are quite accidental. By heating the tinned iron to different degrees of heat, stars, fern-leaves, and other figures, are produced; and by pouring one of the above mixtures, cold, upon a plate of tinned iron, at a red heat, a beautiful granular appearance is obtained. These metallic waterings will bear the blow of a mallet, but not of a hammer; hence the invention may be used for embossed patterns, but not for those which are punched. Different colours and shades may be given by varnishes, which, when properly polished, will set off the beauty of the watering. When the tin is upon copper, the crystallization appears in the form of radiations or stars. M. Lewis Felix Vallet obtained a patent for an invention of this kind, upon delivering the following specification, Feb. 5th, 1818. The process of giving the new ornamental surface on metals or metallic compositions, consists in employing those acids and saline compounds and substances which chemically act upon tin, and which, when employed in the manner to be stated presently, give to the metals or metallic compositions to which they are applied the appearance of a crystalline surface variously modified. To produce this effect, the metal or metallic composition ought to be previously tinned, or covered with a thin coat of tin. If the metal be pure tin, it requires no previous preparation. All grease remaining on the tinned surface in consequence of tinning is to be taken off with a solution of potash, soap, or any other alkaline substances. The tin or tinned surfaces should then be washed with pure water, dried and heated to a temperature which the hand can bear. When the surface has thus been cleaned and heated, any of the acids which act upon tin, or the vapours of those acids will cause the desired appearance of crystallization; but I give the preference to the following composition, which may conveniently be laid over with a brush or a sponge. Take one part by measure of sulphuric acid, dilute it with

five parts of water; take also one part of nitric acid, and dilute it with an equal bulk of water, and keep each of the mixtures separate. Then take ten parts of the sulphuric acid diluted in the manner before stated, and mix it with one part of the diluted nitric acid, and then apply this mixed acid to the tin, or to the tinned surface with a pencil or sponge, as above directed, and repeat the application of the said composition for several times successively, or until the result you expect proves satisfactory. When this has been done, the crystalline surface may be covered with a varnish or japan more or less transparent or coloured, or coloured, and lastly polished in the usual manner. Mr. Shaw, of Brunswick-square, purchased this patent, and tin-plates were made under its protection, at the manufactory of Mr. Burnell, at Battersea. But the process being generally known among chemists, the manufacture declined, and the patent, for which a considerable sum was paid, became of little value.

TIN-PLATES. Add—The manufactory for tinning iron-plates was established at Pontypool by major John Hanbury, where he resided until his death in 1734; and the invention of the art has by some persons been erroneously ascribed to him. His monument may be seen in Trevellin church.

TIOGA, in New York. Add—By the census of 1810, the number of its inhabitants was 7899, including 61 slaves.

TIOGA, a county of Pennsylvania, including two townships, and 1687 inhabitants.—Also, a township of the said county, having 803, the other Delmer, having 884 inhabitants.

TISBURY, including the Elizabeth islands, in Duke's county, Massachusetts, contains 1202 inhabitants.

TITANIUM, *Chemical Properties of,* are given under **TITANIUM,** in *Mineralogy.*

TITICACA. Add—See **CHUCUITO.**

TOBACCO, l. 3, for 1560 r. 1584. See **DRAKE.**

TOBAINA, a township of Cumberland county, in Pennsylvania, having 1799 inhabitants.

TOBY. Add—Also, a township of Armstrong county, in Pennsylvania, having 611 inhabitants.

TOLERATION, l. 18, add—The late abbé Gregoire, in his "Histoire des Sectes Religieuses, &c." observes, that "we must not confound civil and religious toleration. The latter supposes that truth and error are indifferent; which truth can never be, for it is only one; and this being the case religious toleration would be an affront to God, who is truth itself. Civil toleration is that which grants to every one the power of publicly exercising the mode of worship to which he is attached—an inalienable right of every member of society, and which, incorrectly denominated *toleration*, ought to be called *liberty of worship*. It has been already observed, and cannot be too often repeated, that the only authority which the civil magistrate possesses over religious associations is to see that they neither suffer molestation nor molest one another." Col. 6, l. 13, add—and extended to Ireland by 57 Geo. III. c. 70.

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TOLLAND. Add—Also, a town of Massachusetts, in the county of Hampton, having 798 inhabitants.

TOOLAVA, an Indian language, which extends from Nilivuram to Sedebagar, S. of Goa.—Also, the name of a country considered as a subdivision of Kérela, which extended from Cocuro, round Cape Comorin, to the river Tumbrapural in Tinnavelly.

TOOMBUDRA, a river of Hindoostan, which is a southern branch of the *Kijhwa*; which see.

TOPASSES, an Indian denomination of native black Christians, the remains of the ancient Portuguese.

TOPHANIA, or **TOFFANIA,** the name of a woman who resided first at Palermo, and afterwards at Naples, and who rendered herself infamous by preparing and administering poison. She sold those drops which from her acquired the name of *Aqua Tophania, Aqua della Toffana*. It was called also *Acquetta di Napoli*, or only *Acquetta*; but she distributed her preparation, by way of charity, to such wives as wished to have other husbands. From four to six drops were sufficient to destroy a man; and it has been asserted, that the dose could be so proportioned as to operate in a certain time. As she was watched by the government, she fled to an ecclesiastical asylum; and when Keyler was at Naples in 1730, she was then living; her life being secure under that protection. It was her practice to distribute her poison in small glass phials, upon which was this inscription, "Manna of St. Nicholas of Bari," and ornamented with the image of that saint, whose reputation prevented its being particularly examined by the custom-house officers. About the year 1709, Tophania fled from one convent to another; but she was at length seized and thrown into prison. Her imprisonment, as she was under ecclesiastical protection, excited the indignation of the clergy, who endeavoured to raise an insurrection among the people; but they were appeased upon Tophania's confession, that she had poisoned all the springs in the city. Upon the rack she acknowledged her wickedness; her protectors fled, and she was strangled; and in order to infligate the archbishop, her body was thrown, at night, into the area of the convent from which it was taken. Her secret did not die with her; but her poison was secretly prepared and administered at Naples after her death. It was afterwards presumed, from the effects of her poison, that it was a preparation of arsenic. Kayler. Beckmann, Hist. Invent. vol. i.

TORPEDO, a kind of destructive machine, invented by Mr. Fulton, to whom we owe the construction of the much more useful naval machine, *viz.* the steam-boat. Add—This submarine mine, however it may give celebrity to the ingenuity of the inventor, will, we trust, for the sake of humanity and the honour of naval conflicts, never be adopted in any civilized nation.

TORRES VEDRAS. Add—This ancient town lies about seven leagues from Lisbon, and is situated in a small plain, about three leagues from the sea, on the river Zigan-dra. It owes its name to the circumstance of there being the ruins of many old towers in its neighbourhood. The principal one, or castle, has been repaired, and serves as a point of defence to the works thrown up at this important pass, which covers two great roads leading to Lisbon from this point, one by Mafra, the other by Euxarra dos Cavalleiros. Although this may be a sufficient description of it in a geographical point of view, we do not think it should be omitted to be here stated, that the celebrated position occupied by the duke of Wellington to cover Lisbon in the fall of the year 1810, took its name from this town, which formed one of the principal points of the line of defence, which was carried across from the Tagus to the sea, presenting a *contour* of about forty miles, of such an imposing nature as to render unavailing all the efforts of an almost overwhelming French army, under one of their most distinguished marshals, to expel the Anglo-Portuguese from the

the Peninsula. This line of defence (with another about five miles in its rear), stretched from the Tagus at Alhandra to the sea where the Zigadra falls into it, being a direct line of about twenty-six miles. The whole of this most extensive, varied, and gigantic position, was selected and formed under the duke of Wellington's direction, with the most unwearied exertion by those able and scientific engineers the late Sir Richard Fletcher and colonel Chapman, and with the retreat of the French from before it, may be said to have commenced the series of achievements which finally ended in the triumphs of the British army in the heart of France.

TORRINGTON, l. 1, after Connefticut, add—in the county of Litchfield, containing 1586 inhabitants.

TORSK. See *GADUS Brofme*.

TORTURE. At the clofe, add—Torture was abolished in Sweden by order of the king in 1786; in Poland, in 1776; in France by edict, Aug. 16, 1780; in Spain, Aug. 1814; and in Aultria, in 1776.

TOURACO. See *CUCULUS* and *ORÆTHUS*.

TOWIACHES, l. 1, insert—(see *PANIS*); l. 5, after miles, add—N. lat. 35° 20'. W. long. 97°.

TOWNSEND, l. 1, add—in the county of Middlefex, containing 1246 inhabitants.

TOWNSHIP, *Upper, Middle, and Lower*, three townships of Capemay county, in New Jerfey; the first having 1664, the fecond 1106, and the third 862 inhabitants.

TRACHYMENE, in *Botany*, from *τραχυς*, rough, and *μῆνα*, (as we prefume,) a membrane, alluding to the roughnefs of the covering of the feeds.—Rudge Tr. of Linn. Soc. v. 10. 300.—Clafs and order, *Pentandria Digynia*. Nat. Ord. *Umbellatæ*.

Eff. Ch. Umbel fimple. Involucrum of many leaves. Perianth a flight border. Petals acute, ftraight, undivided. Fruit nearly orbicular, compressed, mucicated.

1. *T. incifa*. Smooth Trachymene, or Botany-bay Carrot. Rudge as above, t. 21. f. 2.—Stem nearly naked, fmooth. Umbels terminal.—Sent, many years fince, under the above Englifh name, from Port Jackson, by Dr. White. We have heard that the root is eatable, and like a carrot. The herb is fmooth, two or three feet high. Stem round, fender, alternately branched, each of the long, terminal, naked, fimple branches bearing a denfe, fimple umbel, fearcely an inch broad, of numerous, white or reddifh, uniform, equal flowers. Leaves of the involucrum awl-fhaped, fhorter than the umbel, combined at the bafe. Fruit fomewhat heart-fhaped, broader than long, mucicated all over, when quite ripe, with crowded, blunt tubercles. One feed is often abortive. The leaves are chiefly radical, flalked, fmooth, ternate, with wedge-fhaped, three-cleft, notched fegments.

2. *T. pilofa*. Hairy Trachymene.—Stem leafy, hairy, as well as the leaves and footstalks. Umbels lateral.—Gathered by Mr. Menzies, at King George's Sound, on the weft coaft of New Holland. Whole herb rough with fhort fhaggy hairs. Umbels on ftout flalks, from the forks or fides of the ftem. Tubercles of the fruit acute, brittle-pointed. See *FISHERIA*.

TRATH COCH, for REDWHARF r. REDWARTH.

TRELLECH, or TRELLECK. Add—in 1811 the town contained 23 houfes, and 121 perfons; viz. 58 males, and 63 females. The parifh of this name, in the upper divifion of Ragland hundred, confifts of the parifh divifion, the town divifion, and the Grange divifion: the former contained 131 houfes, and 568 perfons; 275 being males, and 293 females: and the latter included 20 houfes, and 134 perfons; 74 being males, and 60 females.

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TRENTON, l. 6, r. 3000.

TREVETHIN, a populous parifh of the county of Monmouth, in the upper divifion of Abergavenny hundred, which, including Pont-y-pool, contained, in 1811, 466 houfes, and 2423 perfons; viz. 1211 males, and 1212 females: 123 families being employed in agriculture, and 280 in trade, manufactures, or handicraft.

TRICHECUS—ROSMARUS, r. Jonifone.

TRIDACTYLUS, a fpecies of *Bradypus*; which fee. See alfo *SLOATH*.

TSCHUTSKI. See *CHURSTSKIIA*.

TURCOMANIA. Add—See *ARMENIANS*.

TURNER, l. 2, add—and county of Oxford, having 1120 inhabitants.

TURNSTILE, in *Fortification*, a kind of barrier, which confifts of two or three pieces of timber, formed crofways, and making four or fix rays like the fpoakes of a wheel; the frame is put on a poft in the middle of a paffage to turn horizontally, fo that two of its rays always fretch acrofs the paffage, and prevent more than one perfon at a time from paffing the fame way.

TUSKARAWA, r. TUSCARAWA.

TWEDDELL, JOHN, in *Biography*, an accomplished fcholar, whose early fate has been much lamented by all the lovers of literature and the arts, was the eldeft fon of Francis Tweddell, eq. of Threepwood, in the county of Northumberland, was born on the 1ft of June 1769; and after paffing through the ufual courfe of preparatory education, was entered at Trinity college, Cambridge, where he diftinguifhed himfelf by fuch proofs of original genius as are, perhaps, without example, even in the records of that learned fociety. As a candidate for univerfity honours, his "Prolufiones Academica" attelt his fuccels to have been equally brilliant and extraordinary, and fuperfede the neceffity of particular illuftration. Mr. Tweddell was elected a fellow of Trinity college in 1792, and foon afterwards entered himfelf a ftudent of Lincoln's Inn, where he kept his terms, and continued to refide until the year 1795, when he left England to commence his travels on the continent of Europe—and met with that untimely fate which has mixed his afhes with thofe of the fages and philofophers of Greece. He vifited Switzerland, Germany, moft parts of the Ruffian empire, and particularly the Crimea, where his intercourfe with profefor Pallas was of the moft intimate kind, and had fo endeared him to that amiable fcholar, that the admiration with which he fpoke of him partook of the tendernefs and affection of a father. From the borders of the Euxine, where his refearches were both diligent and productive, he proceeded to Conftantinople; and after fpending fome part of the fummer of 1798 under the hofpitable roof of Spencer Smith, eq. the Englifh minifter, he took his departure for the Grecian iflands; and having travelfed the provinces of Macedonia and Theffaly, arrived at Athens; where, after a refidence of feveral months, he reached the period of all his learned labours, on the 25th of July 1799.

Mr. Tweddell, independent of the advantages which his own merit fe cured for him in the countries which he vifited, poffeffed recommendations and facilities of a fuperior kind for conducting his learned purfuits; and his induftry keeping pace with his talents and opportunities, his collections and manufcripts are known to have been extenfive and fingularly valuable. Perhaps no traveller of modern times has enjoyed in an equal degree the means of investigating the antiquities of Greece.

His remains were interred in the beautiful Doric temple of Thefus at Athens; and his grave was fimplly a fmall

oblong heap of earth, like those over the common graves in all our English church-yards, without a stone or inscription of any kind; and his body was carelessly deposited at about three or four feet beneath the surface. The part of the temple where it has been buried is now converted into a Greek church, dedicated to St. George; but as this building is occasionally open and liable to the intrusion of animals, who sometimes seek such retreats, Dr. Clarke and his companions, in their travels to Athens, obtained leave

to take up the coffin, and to have it properly covered; and a Greek epitaph, composed by Mr. Walpole in 1805, has been inscribed on a large block of Pentelician marble from the Parthenon, for recording the merits of the deceased. The completion of this business has been owing to the exertions of lord Byron, and Dr. J. F. Lee, of St. John's college, Cambridge. Clarke's Travels, vol. vi.

TWIGGS, I. 2, add—of whom 642 were slaves in 1810.
TWIST, and TWISTING. See MANUFACTURE of Cotton.

V and U.

V A N

VAMANAVATARA, col. 3, l. 11, for admiral *v.* adviser.

VANDELLIUS, **VANDEL**, in *Ichthyology*, a genus of fishes of the order Thoracici, considered by Dr. Vandelli of Coimbra as nearly allied to the genus Trichurus; the characters of which are, body extremely long, sword-shaped, gill-membrane five or six-rayed, and teeth subulate, those in front largest. This fish is the silvery vandell, with forked tail, which occurs, very rarely, in the Mediterranean and Atlantic seas, and sometimes near Lisbon.

VANDER WEYDE, **ROGER**, called Roger of Bruges, in *Biography*, an historical and portrait painter, was born at Bruges about the year 1455, and became the disciple of John Van Eyck, who, at a short period before his death, discovered to him the secret of painting in oil. From this time he distinguished himself by many grand compositions in a large size, and was considered as one of the first Flemish artists who improved the national taste, divesting it in some degree of the Gothic, and manifesting grace in the airs of his heads, as well as correctness in his design. He painted the portraits of several princes, and of many persons of eminence, and obtained a considerable degree of fame and fortune. His paintings in the town-hall of Bruges have been much commended; one of which is formed on the subject of Trajan's justice, executed on one of his soldiers, on the complaint of a mother, whose son had been murdered by him; and that of another is Archambant, prince of Brabant, stabbing his nephew, who was his next heir, when he himself was near dying, for having ravished a maid of that country.

VAN UTRECHT, **ADRIAN**, was a native of Antwerp, where he was born in 1599, and learnt the art of painting: at first painting peacocks and other fowl for his amusement, in which he so much excelled that he was encouraged to prosecute this branch of his art. The subjects to which his attention was principally directed were fruit, birds, flowers, dead game, and objects of still life; imitating and copying nature, and distinguished by correct drawing, and the colouring of nature. He was deemed next to Sneyden in that style of any of the artists in the Low Countries; and though he was very industrious, he

V E L

could not execute one half of the orders which he received. His manner of pencilling was peculiarly delicate, and gives an uncommon transparency to his colours. Most of his works were engrossed by the king of Spain, so that they became scarce, and they now produce very high prices. This artist died in 1651, at the age of 52 years.

VASSALBOROUGH. Add—containing 2063 inhabitants.

VATICAN. Add—The Vatican, despoiled during the French revolution, can again boast of possessing the Apollo, the Laocoon, the Antinous, and all those fine examples of the exquisite taste and delicate sentiment of that refined people, the Greeks. The Transfiguration of Raffaele, the St. Jerome of Domenichino, and the St. Petronilla by Guercino, since their return from Paris, have been placed in a room by themselves, but inconveniently dark.

VAUXHALL BRIDGE, a bridge over the Thames, extending from Millbank to Smith's tea-gardens, which nearly adjoin Vauxhall Gardens, and connecting the roads branching from that spot to Hyde Park Corner by a straight road and street across Tothill-fields to Eaton-street, Pimlico, and Grosvenor-place. This bridge, constructed by Mr. J. Walker, consists of nine arches of equal span in squares of cast-iron, on piers of rusticated stone, formed of fragments, united by means of Parker's cement. The total width is 809 feet, the span of the arches 78 feet, the height 29 feet, and the clear breadth of the road-way 36 feet. The estimated cost of this bridge was above 300,000*l.*

VELOCIPEDE, **ACCELERATOR**, or *Swift-Walker*, a machine originally invented by baron Charles de Drais, master of the woods and forests of his royal highness the grand duke of Baden, who, in his account of its nature and properties, says, that on a well-maintained post-road, it will travel up hill as fast as an active man can walk; that on a plain, even after a heavy rain, it will move six or seven miles an hour; that, when roads are dry and firm, it runs on a plain at the rate of eight or nine miles an hour, which is equal to a horse's gallop; and that on a descent, its motion is equal to that of a horse at full speed. This machine, the theory of which is founded on the application of a wheel

wheel to the action of a man in walking, consists of two wheels, one behind the other, connected by a perch, on which is placed a saddle for the seat of the traveller. The front wheel is made to turn on a pivot, and is guided in the same manner as a Bath-chair. On a cushion in front, the fore-arm is rested, and by so doing the machine and the traveller are kept in equilibrio.

The management is as follows :—The traveller, having placed himself on the saddle, with his elbows extended, and his body a little inclined forward, must rest his arms on the cushion, and preserve his equilibrium by pressing lightly on that side which appears to be rising. The rudder (if it may be so called) must be held by both hands, which are not to rest on the cushion, but to extend somewhat beyond it, that they may be at full liberty, as they are no less essential to the conduct of the machine than the arms are to the maintenance of the balance of it, for which purpose sufficient dexterity will be soon acquired by attention and practice; then, placing lightly the feet on the ground, long but very slow steps are to be taken in a right line, at first care being taken not to turn the toes out, lest the heels should come in contact with the hind wheel. Dexterity in managing the equilibrium and direction of the machine should be acquired before any attempt is made to accelerate the motion of the feet, or to keep them elevated while it is in rapid motion. This machine will run for a considerable distance while the rider is inactive, and with the same rapidity as when his feet are in motion; and in descent it will surpass the best horses in a great distance, without being exposed to the risks incident to them, as it is guided by the mere gradual motion of the fingers, and may be instantly stopped by the feet. The saddle, as well as the cushion, may be raised or lowered at pleasure, so as to suit the height of different persons. The inventor proposes to construct these machines to carry two persons, and to be impelled by each alternately, or by both at once; and with three or four wheels, with a seat for a lady; besides the application of a parasol or umbrella: and he also proposes to avail himself of a sail, with a favourable wind.

The velocipede has been introduced into this country under letters patent, by Mr. Johnson, a coach-maker in Long Acre, by whom it has been much improved, both in lightness and strength.

VENICE, col. 5, l. 10 from bottom. Add—At the last census, taken about the year 1815, the population was stated to be about 100,000; and it is said to be decreasing.

VENTRILQUOUS, l. 7, add—and LARYNX.

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VERMILION, col. 2, l. 20, add—The painter's vermilion is a fictitious cinnabar, made by sublimating a compound of sulphur and mercury.

VERNON, in *Geography*, a town of Tolland county, in Connecticut, containing 827 inhabitants.

VESICULA FELLIS. See LIVER for GALL-Bladder.

VESTIS ANGELICA, for ANGELIC.

VIENNA, in *Geography*, a township of Trumbull county, in Ohio, including 234 inhabitants.

VIOLIN. Add—The art of holding the bow, and of placing and moving it on the strings, is the most difficult and important to incipient practitioners on the violin, which they have to encounter; as upon that depend the force, sweetness, and penetrating power of the tone. They must pay great attention not to press too hard upon the string, so as to make it curve and deviate from a right line; for then

the tone would be harsh and coarse. Neither must the bow be laid too lightly on the strings, as the tone would then whistle and be too feeble. The just point of accuracy in this particular is, to place the hair on the strings in such a manner, that every part of it is in contact with whichever may be wanted. The bow must not act too near the bridge, nor too distant from it, as only dull and unpleasing sounds would be produced.

VIRAJ, l. 11, for her *v.* ten

VISHNU, col. 2, l. 4, for *sent r.* scent.

VITELLUS. See YOLK.

UNDERSTANDING. See *Mental Philosophy*.

UNITED STATES, col. 6, l. 13 from bottom, add—See CANAL. Col. 7, l. 8 from bottom, add—The manufactures of the United States, previously to the peace of 1815 which reduced their number and value, were estimated at the following yearly amounts:

	Span. Dollars.
viz. Manufactures of Wood	25,000,000
Leather	24,000,000
Soap and tallow candles	10,000,000
Spermaceti candles and oil	500,000
Refined sugar	1,600,000
Cards	300,000
Hats	13,000,000
Spirituous and malt-liquors	14,000,000
Iron	18,000,000
Cotton, wool, and flax	45,000,000
Total	\$151,400,000

Their present value has not been ascertained, but it appears that the exports of their manufactures amounted in 1811 to a total of \$1,553,000, including those for domestic materials at \$1,321,000, and those from foreign materials at \$232,000; and in 1816 to \$1,755,000, including \$1,415,000 of the former kind and \$340,000 of the latter.

The manufactures from foreign materials were, spirits from molasses, refined sugar, chocolate, gunpowder, brass and copper, with medicines. The manufacture of wool is rapidly extending, as are also those of iron and hemp, and especially the latter, and also that of cotton. The manufacture of gunpowder nearly supplies the home market, which is also the case with regard to coarse earthen-ware, window-glass, glass bottles, and decanters. About a million of bushels of salt are manufactured annually; and salt-petre is largely manufactured in Virginia, Kentucky, Massachusetts, East and West Tennessee. Sugar from the maple-tree is produced in Ohio, Kentucky, Vermont, and East Tennessee, to the amount of nearly 10 millions of pounds annually. West Tennessee and Vermont afford abundance of good coppers: 25 millions of gallons of ardent spirits are annually distilled and consumed in the United States: 400 water and horse mills, working 120,000 spindles, are employed in spinning cotton. The fulling-mills amount to 2000, and the number of looms exceeds 400,000; and the number of yards of cloth, manufactured from wool, cotton, and flax, is about 100 millions. They have 300 gunpowder-mills, 600 furnaces, forges, and bloomeries, and 200 paper-mills.

In the state of Vermont, the chief manufactures are those of iron, lead, pipe-clay, marble, distilleries, maple-sugar, flour, and wool. In Massachusetts, the principal manufactures are, duck, cotton, woollen, cut-nails (by a machine invented in Newbury port, which is capable of cutting two hundred thousand in a day), paper, cotton and wool cards,

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playing-cards, shoes, silk and thread lace, wire, snuff, oil, chocolate and powder mills, iron-works, and fitting-mills, and mills for sawing timber, grinding grain, and fulling cloth, distilleries, and glass. In Rhode island, are manufactured cotton, linen, and tow cloth, iron, rum, spirits, paper, wool and cotton cards, spermaceti, sugar, machines for cutting creases, and furnaces for casting hollow ware. In Connecticut, are manufactured silk, wool, card-teeth (bent and cut by a machine to the number of 86,000 in an hour,) buttons, linen, cotton, glass, snuff, powder, iron, paper, oil, and very superior fire-arms. In New York, are manufactured wheel-carriages of all kinds, the common manufactures, refined sugar, potters'-ware, umbrellas, musical instruments, glass, iron, and steam-boats. In New Jersey, are numerous tanneries, leather manufactories, iron-works, powder-mills, cotton, paper, copper-mines, lead-mines, stone and slate quarries. In Pennsylvania, there are valuable collieries on the Lehigh river, distilleries, rope-walks, sugar-houses, hair-powder manufactories, iron founderies, shot manufactories, steam-engines, mill machinery, type-founderies, improvements in printing, and carpet manufactory. In Delaware, there are cotton and bolting cloth and powder manufactories, fulling, snuff, fitting, paper, grain and saw mills. In Maryland, are iron-works, collieries, grist-mills, glass-works, stills, paper-mills, and cotton. In Virginia, are lead-mines, iron-mines, copper-mines, salt collieries, and marble quarries. In Kentucky, are manufactured cotton, wire, paper, and oil. In Ohio, ship-building is carried to a great extent. In North Carolina, the pitch-pine affords excellent pitch, tar, turpentine, and lumber; also iron-works, and a gold-mine, which has furnished the mint of the United States with a considerable quantity of virgin gold. In South Carolina, are gold, silver, lead, black-lead, copper and iron mines, and also pellucid stones of various hues, coarse cornelian, variegated marble, nitrous stone and sand, red and yellow ochres, potters'-clay, fullers'-earth, and a number of dye-stuffs, chalk, crude alum, sulphur, nitre, and vitriol. In Georgia, the manufactures are indigo, silk, and fago. In Louisiana, are manufactured cotton, wool, cordage, shot, and hair-powder.

But the most extraordinary, and perhaps the most important manufacture in the United States, is that of steam-boats; the first application, if not invention, of which is ascribed to Mr. Fulton. It was in the year 1807 that the first steam-boat plied between the cities of New York and Albany; but since that time this mode of navigation has been successfully used in many other rivers of the United States besides the Hudson; so that steam-boats now ascend the Mississippi and Ohio rivers, hitherto nearly unnavigable, except in the direction of their currents. The following table shews the cheapness, as well as expedition, of travelling since food as well as conveyance is included.

	Expence.	Hours.	Miles.
From Philadelphia to New York, by steam-boats and stages	\$10	13	96
New York to Albany, by steam-boats	7	24	160
Albany to Whitehall, by stages	8	12	70
Whitehall to St. John's, by steam-boats	9	26	150
St. John's to Montreal	3	4	37
Montreal to Quebec, by steam-boats	10	24	186
	47	103	609

In the spring of 1817, a steam-boat reached Louisville, in Kentucky, from Pittsburg, in Pennsylvania, dropping down the Ohio. She displayed her power by different

tacks in the strongest current on the falls, and returned over the falls, stemming the current with ease. About the same time, a large steam-boat reached Louisville from New Orleans, laden with sugar, coffee, wines, queen's-ware, railfurs, fur, steel, lead, &c.; her freight equaling 25,000 dollars.

As for the revenue of the United States we can only collect a few particulars. We observe in general, that the national debt at present does not amount to 120 millions of dollars. Its sinking fund consists of an annual appropriation of \$8,000,000, arising from the interest of the debt redeemed, amounting in 1813 to \$1,932,107; for the sales of public land, equal in that year to \$830,671; and from the duties on imports and tonnage. The revenue of the United States, previous to the late war against England, were derived from duties and taxes on imports, tonnage of ships and vessels, spirits distilled within the United States, and stocks, postage of letters, taxes on patents, dividends on bank-stock, snuff manufactured in the United States, sugar refined here, sales at auction, licences to retail wines and distilled spirits, carriages for the conveyance of persons, stamped paper, direct taxes, and sales of public lands. The revenues have been chiefly derived from duties on imports and tonnage. Internal taxes have been laid at different periods by the Washington administration, but were all discontinued by an act passed April 1802, under the auspices of Mr. Jefferson. The following statement exhibits the estimated receipts and expenditures of the United States at different periods.

Years.	Receipts.	Expenditures.
1791	\$448,913	\$1,718,129
1795	5,954,534	4,359,596
1800	10,777,709	7,411,369
1808	17,068,661	6,504,338
1809	17,773,473	7,414,672
1818	19,550,000	18,850,000
1819	22,950,000	22,880,000
1820	22,320,000	22,910,000

The net amount of revenue received in 1815 was \$50,906,106, being from customs \$37,656,486; internal duties, \$5,963,225; direct tax, \$5,723,152; public lands \$1,287,959; postage, &c. \$275,282. The report of the secretary of the treasury for the year 1816 states, that on the 12th of February 1816, the whole of the public debt, funded and floating, was \$123,630,692; but on the 1st of January 1817 did not exceed \$109,748,272, reducing the debt from Feb. 12th, 1816, to Jan. 1st, 1817, \$13,882,420. The secretary, in his Report of the 5th of December 1817, estimates the expenditure of the year 1818 at \$21,046,331, and leaves a balance in the treasury of \$8,578,648 on Jan. 1st, 1819.

The American capital, consisting of personal property \$2,200,000,000, and of real property \$5,000,000,000, amounts to \$7,200,000,000; the income, \$300,000,000; expenditure, \$450,000,000; national debt, \$100,000,000.

The salaries of the principal officers of the federal government are as follow :

	Dollars.
President, per annum	25,000 = 562 <i>l</i> .
Vice-president, ditto	5000 = 112 <i>l</i> 5 <i>s</i> .
Secretary of state, ditto	5000
Treasury, ditto	5000
War, ditto	4500
Navy, ditto	4500
Ministers plenipotentiary, ditto	9000 = 1822 <i>l</i> 10 <i>s</i> .
Members of Congress, per day	8

For further particulars we refer to general Hamilton's "Report on the Subject of Manufactures;" also his "Reports on Public Credit," and "On a National Bank;" Tench Coxe's "View of the United States;" Gallatin's "Sketches of the Finances of the United States;" "Treasury Reports from 1790 to 1817;" Bludgett's "Economics;" Pitkin's "Statistics of the United States;" and Brifted's "America and her Resources," Lond. 1818.

Col. 12, Population in 1817, stated by Brifted in his "America and her Resources."

States and Territories.	Population.
Maine - - - -	318,647
Massachusetts - - - -	504,592
New Hampshire - - - -	302,733
Vermont - - - -	296,450
Rhode island - - - -	88,321
Connecticut - - - -	349,568
New York - - - -	1,486,739
New Jersey - - - -	345,822
Pennsylvania - - - -	986,494
Delaware - - - -	108,334
Maryland - - - -	502,710
Virginia - - - -	1,347,496
Ohio - - - -	394,752
Kentucky - - - -	683,752
Tennessee - - - -	489,624
North Carolina - - - -	701,224
South Carolina - - - -	564,785
Georgia - - - -	408,923
Louisiana - - - -	86,734
District of Columbia - - - -	37,892
Mississippi Territory - - - -	104,550
Illinois Territory - - - -	39,000
Michigan Territory - - - -	9,743
North-west Territory - - - -	
Missouri Territory - - - -	68,794

Brifted observes, that the population of the whole United States has hitherto doubled itself in less than twenty-five years. The New England states, he says, of course do not retain their proportion of this increase, because large bodies of these people migrate annually to the western country, which has therefore increased much faster than the states to the southward. Kentucky, *e. gr.* has increased 80 *per cent.* in ten years; Tennessee, 95; Ohio, 180; Louisiana, 150; Indiana, 800; Mississippi territory, 160; Illinois territory, 700; Missouri territory, 600; Michigan territory, 600; while of all the Atlantic states, the greatest increase is only 44 *per cent.*, the population growth of New York; and the least is, that of Virginia, only 20 *per cent.*; so that in a few years the states will range, if the future be like the past, as to their aggregate population in the following order, *viz.* New York, Pennsylvania, Virginia, Kentucky, Ohio, North Carolina, Massachusetts, South Carolina, Tennessee, Maryland, Georgia, New Jersey, Connecticut, Vermont, Louisiana, New Hampshire, Indiana, Missouri, Mississippi, Illinois, Delaware, and Rhode island.

VOLTAISM, l. 13.—The general conclusion deduced by Galvani from his experiments was, that the animal body possesses an inherent electricity of a specific kind, which is connected with the nervous system, and conveyed by means of the metals into the muscles, so as to throw them into convulsions. From his discoveries he formed, with a preciptance that led him into error, a theory of muscular motion, according to which the body contains an apparatus

analogous to the Leyden phial, its different parts being in different states of electricity, and the metals forming a connection between them, by which the electricity is equalized. Fowler, in his "Essay on Animal Electricity," published in 1793, concludes, that the galvanic influence is not referable to electricity, because, for the production of the former, the presence of two different metals appears to be necessary, while electricity, as proceeding from the electrical machine, is excited by the action of an electric upon a conductor. He also endeavoured to shew, says Dr. Bostock, the ingenious historian of galvanism, that electricity and galvanism are not, in all cases, conducted by the same substances; and he also made some curious observations upon the effect of galvanism on animals not furnished with distinct limbs, such as worms of various kinds. In the same year, 1793, professor Volta's communications appeared in the Philosophical Transactions of London, who adds to his luminous account of Galvani's discovery many curious experiments and observations of his own. He attempted, and with complete success, says Dr. Bostock, to overthrow Galvani's opinion, that the animal body bears an analogy to the Leyden phial, its different parts being in opposite states of electricity. He suggested, that for the production of the effect it was essential to have two different metals; and hence he was led to conclude, that the muscular contractions are produced by small portions of electricity that are liberated by the action of the metals upon each other. This action of the metals upon each other is described as destroying their electrical equilibrium; and by establishing a communication between them, their equilibrium is restored. This destruction of equilibrium he considers as a new law of electricity discovered by himself; and the animal is supposed to have no further concern in it, than as being a peculiarly sensible electrometer, and affording a very delicate test of the presence of this disengaged electricity in its passage from one metal to the other. He also established another point, *viz.* that the nerve is the organ on which the galvanic influence immediately acts; but he found that if a part of a muscle be laid upon two different metals, and these be made to communicate, a contraction is produced. He also confirmed the fact, previously noticed by Fowler, but by independent experiments, that snails and worms could not be made to contract; but that many of the insects, as butterflies and beetles, were subject to the influence of the metals. For an account of Dr. Wells's experiments and observations, we refer to his paper in the Phil. Transf. for 1795. Professor Volta, prosecuting his inquiry into the nature of galvanism, was led to introduce a new principle into his theory. Having before stated that two metals were essential to the extrication of the electric influence, he informs us, that their metallic nature may be dispensed with, provided that the substances differ in their power of conducting electricity. Accordingly he divides conductors into the two classes of dry and moist; the first including metals and charcoal; the latter, essentially consisting of water, holding various substances in solution. In order to form a galvanic circuit, it is necessary that a body from one of these classes be placed between two bodies from the other class: and thus the equilibrium is destroyed, which is again restored when the two are united by a conductor. (See GALVANISM.) For further particulars we are under a necessity of referring to Dr. Bostock's very valuable "Account of the History and present state of galvanism," 8vo. London, 1819.

At the close, add—It is natural to conclude, that galvanic electricity would be applicable to medical purposes. Accordingly we find, that about the year 1804, it was extensively

tensively employed, more especially in those diseases in which common electricity had been found useful. But the expectations that were formed concerning the efficacy of this powerful agent were generally disappointed. Flattering accounts, however, says Dr. Boitock, (*ubi supra*) of its success in different nervous disorders, in paralytic affections, in deafness, in some kinds of blindness, in the recovery of persons apparently drowned or suffocated, and even in hydrophobia and insanity, were published. But the credit of the proposed remedy was not permanent; and it therefore sunk into disuse. Of late it has again been brought into notice by Dr. Philip of Worcester, who has made trial of it, with beneficial effect, in spasmodic asthma. Boitock's Hist.

UPPER, in *Geography*, a township of Scioto county, in Ohio, having 496 inhabitants.

URFE, HONORE' D', count of Chateaufef, and marquis of Vilromery, in *Biography*, was the fifth son of James D'Urfé, a noble family of Forez, originating from Swabia, and born in 1567 at Marseilles, in which city he was educated, and also in the Jesuits' college at Tournon. Although he was first destined to be a knight of Malta, he was diverted from this purpose by his objection to celibacy; and he afterwards obtained a dispensation to marry the wife of his brother Anne, who was separated from her on account of impotence, and became an ecclesiastic. His view

in this marriage was to secure the property of his wife, who was a rich heiress, to his own family; but as he had no children by her he was disappointed in his mercenary purpose, and the connection was unhappy. Thus frustrated in his selfish views, he retired to Piedmont, and devoted himself to letters. He was the author of several publications; but his name has been celebrated as a romance writer, on account of his "Alfrée," which was published in five separate volumes, at successive periods, and continued as a performance of general perusal for fifty years. This romance exhibits a picture of human life in its various conditions, and displays ample invention and acquaintance with men and characters under the disguise of pastoral fiction, from which, however, the author often deviates; he furnishes a history of his courtship of Diana de Chateau-Morant, his brother's wife, whom he married, and of the gallantries of the court of Henry IV. Although it was at a former period much read, it is too trifling for instruction and too tedious for amusement. It was often republished, but the best edition is said to be that of Paris in 1753, in 10 vols. 12mo. by the abbé Souchai. D'Urfé died at Villafanche in 1625. His brother Anne was also a writer, and published some poems. Moreri. Gen. Biog.

VRIHASPATI, l. 8 from bottom, for SUTTEE r. SUTTEE.

W.

W A R

WALLINGFORD, in Vermont, &c.; l. 5, r. 1325.

WALPOLE, l. 2, r. 1894.

WALTON, in Derbyshire. This township is in the parish of Chesterfield; and in 1811 it contained 133 houses, and 720 persons; viz. 375 males, and 345 females.

WALTON-le-Dale. This township, in 1811, contained 827 houses, and 4776 persons; viz. 2263 males, and 2513 females: 175 families being employed in agriculture, and 616 in trade, manufactures, or handicraft.

WALTON-on-the-Wolds. In 1811, this parish contained 47 houses, and 222 persons; viz. 111 males, and 111 females.

WALTON-upon-Thames. In 1811, the town contained 104 houses, and 606 persons; viz. 315 males, and 291 females.

WANDSWORTH. In 1811, the parish contained 905 houses, and 5644 persons; viz. 2728 males, and 2916 females.

WARLEY. In 1811, this township contained 764 houses, and 3958 persons; viz. 1941 males, and 2017 females: 27 families being employed in agriculture, and 758 in trade, manufactures, and handicraft.

WARPING. See WEAVING.

WARREN, in *Geography*, a county of Ohio, containing five townships, and 9925 inhabitants.

WARTERBURG, a town of Chittenden county, in Vermont, having 864 persons.

W A T

WASHINGTON, l. 14 from bottom, add—including 315 slaves.

WASHINGTON, a township of Pennsylvania, in the county of Fayette, having 2160 inhabitants.

WASH-WHEELS, in *Bleaching*. See BLEACHING.

WATCH, in *Horology*. Col. 11, l. 4 from bottom, for 2 C R 1 r. 2, 6, 1, R; l. 11 from bottom, and col. 12, l. 9, *dele* while the quarters are struck, and substitute words to this effect—While the crémallère is pushed down for the purpose of striking the hours. The fact seems to be, says an ingenious correspondent, that while the quarters are striking, the tail-piece 3, 4, is behind the teeth of the rack G; and the contrivance here described is merely to take 3, 4 out of the way of these teeth, when, by pushing in the pendant, they are carried back preparatory to striking the hour. Col. 25, l. 22 from bottom, for p. 66, &c. r. p. 166, &c. —*Warning-Watch by Berrallas*, col. 2, l. 7 from the bottom, for hours-wheel u, r. hours-wheel n.—*Musical-Watch*, col. 1, l. 28, for balance-wheel I r. balance-wheel L.

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WATER, p. 21, col. 2, add—*Llanarthna spring*, at a village in the vale of Towy, seven miles above Caermarthen; a strong chalybeate, in one gallon of which the gaseous contents

contents are, carbonic acid 16½ cubic inches, atmospheric air 4½ ditto, and solid contents,

Carbonate of lime	-	-	Grs.
————— of iron	-	-	4½
Muriate of soda	-	-	5½
————— of lime	-	-	6
Sulphate of lime	-	-	5¾
			z

WATER, in *Gardening*, col. 2, l. 40, r. Loudon. Col. 5, l. 23, ditto. Col. 7, l. 36, ditto. Col. 10, l. 30, ditto.

WATER-Organ. See HYDRAULICON.

WATER, *Vases and Glasses tuned by*. See ARMONICA, LASUS, and HYPYPASUS.

WATER *Whimsy*. See WHIMSEY.

WATSON, THOMAS, in *Biography*, was born in 1590, and was editor of the second collection of Italian madrigals that appeared in England under the following title: "The First Part of Italian Madrigals Englished, not to the Sense of the original *Diittie*, but after the Affection of the Noate." This collection, as we are told in the title-page, includes "Two excellent Madrigalls of Maister William Byrd's, composed after the Italian Vaine, at the Request of the faid Thomas Watson." The poet is as much distressed for double rhymes to suit the original stanza and music of these madrigals, as his predecessor, N. Yonge, in a former publication. That madrigal, indeed, which Byrd set, first in four parts, and then in six, seems original English, and is the best of the collection.

This sweet and merry month of May,
While Nature waltons in her prime,
And birds do sing, and beats do play,
For pleasure of the joyfull time;

I chose, the first for holly daie,
And greet Eliza with a ryme:
O beauteous Queene of second Troy,
Take well in worth a single toy.

The editor seems to have been a man of some learning, as well as knowledge in music, as he dedicates the work, in a Latin copy of verses, to the earl of Essex, then at the summit of favour with queen Elizabeth; and addresses Luca Marenzio, from whom most of the madrigals were taken, in another.

WEARE, l. 2, r. Hillborough.

WEBB, senior, in *Biography*, a favourite author of English catches and glees, and one of the most successful candidates for prizes at the catch-club during the most brilliant period of its institution in 1762. See CATCH, and CATCH-CLUB.

WEBB, DANIEL, esq. author of an elegant and ingenious tract, intitled "Observations on the Correspondence between Poetry and Music," 1769, 12mo. This author had acquired considerable reputation by two former dissertations in dialogue; the first, "An Inquiry into the Beauties of Painting;" the second, "Remarks on the Beauties of Poetry;" which had rendered the public willing to receive favourably a third work from the same pen. Much learning, extensive reading, and a classical taste, were manifested in this production, "On the Correspondence between Poetry and Music." It is, however, more metaphysical and less intelligible than his former tracts. The author seems to have conceptions difficult to bring forth, and out of the reach of common language to express. He seems to concur with Rousseau, that "music cannot narrate, nor precisely express or paint any particular passion;"

but it can awaken sensation and sentiments near the truth, and, with the assistance of poetry, can be pointed to a determined affection or passion. It can soothe affliction, it can supplicate, it can animate and rouse our courage, excite hilarity, and generate ideas of grace, innocence, and content, without the interpretation of poetry; but having nothing to imitate in nature, like poetry and painting, imagination must assist in finding similitudes.

The speculations of Mr. Webb are not always free from obscurity, though his language (when not deformed by his fondness for *hath*) is accurate and elegant. He says, that "music cannot give pain, like poetry and painting;" but extreme harsh discords allowed to be occasionally used in counterpoint, give pain to the ear, as intense as painting and poetry to the eye and the mind. The author's chief illustrations are from Milton; and the work seems more intended to shew the *beauties of Milton*, than the analogies between poetry and music. The expression of music arises more immediately from rhythm than from the arrangement or combination of sound, and many of its imitative beauties, perhaps all, are ideal. Mr. Webb's ideas in general are delicate, refined, and beautifully expressed. But he never ventures to imitate a musical composition or single passage which reminds us of practical music; and it does not clearly appear what kind of music he most approves, or indeed what it is that he honours with the name of *music*.

Mr. Webb was one of the first in our country who ventured to say, that counterpoint and complication of parts in dissimilar motion was an enemy to melody and expression; he quotes Algarotti's "Saggio sopra l'Opera in Musica," in confirmation of his opinions; but Rousseau preceded both, in his "Lettre sur la Mus. Fran." published in 1751, when he first developed his idea of "Unité de Mélodie." Mr. Webb's observations, indeed, abound with deep reflections and *belle parole*; but we have not yet discovered what benefit lyric poetry or vocal music can derive from such discussions.

WEIDEMAN, —, came to England about 1726. He was long the principal solo player, and composer, and master for the German flute. He was a good musician, and played so well on the organ, that we remember Handel, at a rehearsal of an oratorio in Covent Garden theatre, desiring him to touch a new organ just finished by the elder Byfield, that he might judge of its effects in different parts of the theatre, in which he was obeyed by Weideman with considerable abilities. But in his productions for the German flute, he never broke through the bounds of that mediocrity to which his instrument seemed confined.

WEIGEL, —, an excellent performer on the violoncello, whom we heard in 1772, at Vienna, in a grand concert given to all the first people of that imperial city, and by the best performers that could be selected. Gluck and his niece, a pupil of Millicco, and an enchanting singer, were there, and she sung, sometimes to her uncle's accompaniment on the harpichord only, and sometimes with more instruments, in so exquisite a manner, that we could not conceive it possible for any vocal performance to be more perfect.

Between the vocal parts of this delightful concert, some admirable quartets, by Haydn, were executed in the utmost perfection: the first violin by Startzler, who played the *adagios* with uncommon feeling and expression; the second violin by Ordonitz, a good performer in the emperor's band; the tenor by count Brühl, one of the four sons of the great Saxon minister, an admirable dilettante, and fine performer on several instruments; and the violoncello by Weigel, the subject of the present article. All the performers

formers in this concert, finding the company attentive, and in a disposition to be pleased, were animated to that true pitch of enthusiasm, with which, when musicians are themselves inflamed, they have a power of communicating to others their own order, and of setting all around in a blaze; so that the contention between the performers and hearers on this occasion was only who should please, and who applaud the most.

WEISS, SYLVIVS LEOPOLD, a famous performer on the lute, born in Silesia, travelled into Italy in 1708, in the suite of prince Alexander Sobiesky, who dying at Rome, he was obliged to make his lute bear his expences back into Germany, going first to Breslau and afterwards to Dresden, where he was engaged in the service of the king of Poland, and became the most celebrated lutenist at that time in Europe. Germany has produced many eminent musicians of the name of Weifs; as John Adolphus Faustinus, son of Sylvius Leopold, a lutenist likewise; C. Weifs, a performer on the German flute, who visited London in 1783, an ingenious and curious man, who had improved his instrument, and had many curious peculiarities in his performance.

WELDON, JOHN, an eminent musician, was born at Chichester, learned the rudiments of music of Mr. John Porter, organist of Eton college, and afterwards received instructions from Henry Purcell. He was for some time organist of New college, Oxon. But in 1701 he was appointed a gentleman extraordinary of the Chapel royal; and in 1708 succeeded Dr. Blow as one of his majesty's organists. In 1715, upon the establishment of a second composer's place in the king's chapel, Weldon was the first who filled that station, of which he seemed conscientiously determined to fulfil all the duties; for before he had long been in possession of this office, he gave proofs of his abilities and diligence in the composition of the communion service, as well as the several anthems required by the conditions of his appointment.

He was likewise organist of St. Bride's church in Fleet-street, and of St. Martin's-in-the-Fields.

Besides many favourite songs and solo anthems of the time, Weldon composed two full anthems, which are inserted in Dr. Boyce's second volume; the first is rather too familiar and common; but the second, "Hear my crying, O God," in six parts, is a very pleasing and masterly composition; particularly the first movement. In the second movement, the words *up upon* are unfortunately expressed by notes that succeed each other too rapidly for their easy utterance. The passages of the third and fourth movements seem much worn by forty or fifty years use; however, the pauses at the end of the last strain have a fine effect.

Six of his solo anthems were published about the year 1730; we say about that period, as musical chronology is become a very difficult study. The late Mr. Walsh, finding that old music-books were like old almanacs, ceased very early in this century to ascertain the time of their birth by dates, which have ever since been as carefully concealed as the age of antiquated virgins.

Weldon's powers of invention and of harmonical combination seem very much limited. His anthems had the advantage of being sung in the Chapel royal by a celebrated singer, Mr. Richard Alford; but now, let who will execute them, they must appear feeble and old-fashioned, unless the embellishments of George I.'s time are changed for those in present use. The truth is, that the fund of original conception or science, which alone can render old music valuable to the curious, long after the style in which it was written is become antiquated and forgotten, was never

very considerable in Weldon's productions. His first anthem, "O Lord rebuke me not," remained long in favour, when well sung in our cathedrals, from its resemblance to the style of Purcell; and the natural and easy flow minuet air to "Turn thee, O Lord, and deliver my Soul," which has so much of a secular song and rondeau in it, that it is remembered with pleasure by the musical part of a congregation, who are more likely to bear it in mind than more serious parts of the service.

The productions of Weldon appear flimsy after those of Crofts; and Dr. Green's after Handel's: yet Green compared with Weldon is a giant; that is, a Handel.

There is a vice of which composers of small resources are often inadvertently guilty, for want of a sincere and judicious friend to tell them of it; and that is, eternal repetition of the same passage, a note higher or a note lower, which the Italians call *volaba*. This certainly originates in the want of ideas, and yet it may be avoided by attention, though the sheet would not fill so fast. Weldon has indulged himself in these repetitions to a tiresome degree in several of his anthems; but in the ritornel to "Have Mercy upon me, O God," he has iterated the same poor passage a note lower seven times successively!

His song for two voices, "As I saw fair Clora walk alone," was in great favour some years ago; and his air in the Judgment of Paris, "Let Ambition fire thy Mind," is a melody so natural and pleasing, that, like an ever-green in vegetation, it will always be fresh and in season. And there is no air in greater favour than this at present, in the English opera of "Love in a Village," to the words, "Hope the Nurse of young Desire."

This composer died in 1736, and was succeeded in the King's chapel by the late Dr. Boyce.

WELLS, I. I. R. L. and E.

WELLS, in *Geography*, a township of Rutland county, in Vermont, having 1040 inhabitants.

WELSH MUSIC. If incredulity could be vanquished with respect to the account which Giraldus Cambrensis gives of the state of music in Wales during the 12th century, (see GIRALDUS CAMBRENSIS,) it would be by a Welsh MS. formerly in the possession of Richard Morris, esq. of the Tower, which contains pieces for the harp that are in full *harmony* or *counterpoint*: they are written in a peculiar notation, and supposed to be as old as the year 1100; at least, such is the known antiquity of many of the songs mentioned in the collection. But whether the tunes and their notation are coeval with the words, cannot easily be proved; nor is the counterpoint, though far from correct or elegant, of so rude a kind as to fortify such an opinion.

Some part of "this MS.," according to a memorandum which we found in it, "was transcribed in the time of Charles I. by Robert ap Huw, of Bodwigen, in the isle of Anglesea, from William Penlyn's Book." The name of William Penlyn is recorded among the successful candidates on the harp, at the *cisleddfod*, or session of the bards and minstrels, appointed in the ninth year of queen Elizabeth, at Caerwys in North Wales, where he was elected one of the "chief bards and teachers of instrumental song." The title given to these pieces is "Musica neu Beroeriaeth;" and a note in English informs us, that the manuscript contains "the music of the Britons, as settled by a congress, or meeting of masters of music, by order of Gryffydd ap Cynan, prince of Wales, about the year 1100, with some of the most ancient pieces of the Britons, supposed to have been handed down to us from the British bards."

This music is written in a notation by letters of the alphabet, somewhat resembling the tablature for the lute; but

WELSH MUSIC.

but without lines, except a single line to separate the treble from the base.

In the notation, double *ff* seems the lowest note; then the first seven letters of the alphabet are written thus, *g, a, b, c, d, e, f, i*; and the next septenary thus, with a dash over each letter, *f̄, ḡ, ā, b̄, c̄, d̄, ē*. If these letters represent the same sounds as at present, we find some such chords as are admitted in modern harmony; but others frequently occur that are mere jargon.

Many of the bases, or accompaniments to the melodies,

g¹
c¹ These chords
g¹

begin with the chord of C inverted, and melodies are lessons for young practitioners on the harp, and are said to be the exercises and trial-pieces which were required to be performed by the candidates for musical degrees, and for the silver harp. Among the first twenty-four lessons of this kind, some few are easy to decipher, as N^o XI. and XVII., which we shall give here as specimens of this notation, explained in modern musical characters.

No. XI.

Kor Sinfæn 101011-101011											
4				4				4			
g	g	g	g	a	a	a	a	c	c	c	c
g	g	g	g	a	a	a	a	c	c	c	c
g	g	g	g	a	a	a	a	c	c	c	c
g	g	g	g	a	a	a	a	c	c	c	c

Musical notation for No. XI, consisting of a treble clef melody and a bass clef accompaniment. The melody is written in a single line with a treble clef and a common time signature. The accompaniment is written in a single line with a bass clef and a common time signature. The music is in C major and consists of a simple harmonic exercise.

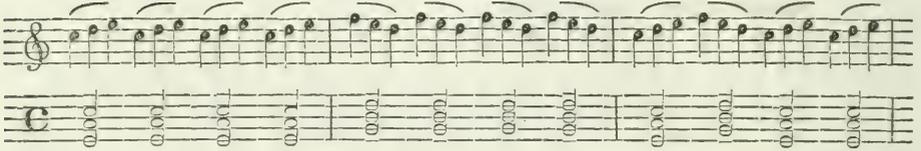
No. XVII.

g				f̄				ḡ			
g	g	g	g	f̄	f̄	f̄	f̄	ḡ	ḡ	ḡ	ḡ
g	g	g	g	f̄	f̄	f̄	f̄	ḡ	ḡ	ḡ	ḡ
g	g	g	g	f̄	f̄	f̄	f̄	ḡ	ḡ	ḡ	ḡ
g	g	g	g	f̄	f̄	f̄	f̄	ḡ	ḡ	ḡ	ḡ

Musical notation for No. XVII, consisting of a treble clef melody and a bass clef accompaniment. The melody is written in a single line with a treble clef and a common time signature. The accompaniment is written in a single line with a bass clef and a common time signature. The music is in C major and consists of a simple harmonic exercise.

WELSH MUSIC.

$\bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2}$ $\bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2}$	$\bar{f} \bar{2} \bar{f} \bar{2} \bar{f} \bar{2} \bar{f} \bar{2}$ $\bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2}$	$\bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2}$ $\bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2} \bar{2}$
$\bar{2} \bar{2} \bar{2} \bar{2}$	$\bar{f} \bar{2} \bar{f} \bar{2}$	$\bar{2} \bar{2} \bar{2} \bar{2}$
$\bar{2} \bar{2} \bar{2} \bar{2}$	$\bar{2} \bar{2} \bar{2} \bar{2}$	$\bar{2} \bar{2} \bar{2} \bar{2}$
$\bar{2} \bar{2} \bar{2} \bar{2}$	$\bar{2} \bar{2} \bar{2} \bar{2}$	$\bar{2} \bar{2} \bar{2} \bar{2}$



After twenty-four lessons, or measures, as they are called, of this kind, there follow twelve variations on a ground base.



This counterpoint, however artless it may seem, is too modern for such remote antiquity as is given to it. The false 5th, from B to F, in the first example, has not been long allowed in harmony; and the unprepared 7th, from B to A, in the second example, is a crudity that has been but very lately tolerated.

That the ancient inhabitants of Wales were great encouragers of poetry and music, cannot be disputed, as many specimens of Cambro-British versification of undoubted antiquity still subsist; and that these poems, as well as those of ancient Greece and Rome, were originally sung and accompanied with instruments, is very natural and reasonable to believe; but that a rude and uncivilized people, driven into a mountainous and barren country, without commerce or communication with the rest of Europe, should invent counterpoint, and cultivate harmony, at a period when it was unknown to the most polished and refined

inhabitants of the earth, still remains a problem of difficult solution.

Dr. Burney gives a farther account of this curious MS. in speaking of national music, and the establishment of musical games or contests in Wales, before any other music seems to have been much cultivated in the rest of the island, except the ecclesiastical or Gregorian chant, which the Britons, driven into the mountains of Wales by the Saxons, seem to have been very unwilling to receive from the Roman missionaries that were sent over to convert their conquerors. The British annals and songs ascribe with great resentment the slaughter of the monks at Bangor, by Ethelbert, king of Kent, to the instigation of Aulfyn the monk, on account of their having refused to submit to the jurisdiction of pope Gregory, and the regulations he proposed.

WELWIN, or WELWYN. In 1811, the parish contained 192 houses, and 1130 persons; *viz.* 567 males, and 563 females.

WEMYSS. In 1811, the parish contained 565 houses, and 3691 persons; *viz.* 1657 males, and 2034 females. This parish includes Buckhaven, E. and W. Coallowns, Kirkland, Methil, E. and W. Wemyss, and the rest of the parish, containing 116 males, and 117 females.

WENDLING, J. BAPTIST, in *Biography*, an eminent performer on the German flute, in the service of the elector palatine at Mannheim in 1772.

Francis and Charles, brothers, performers on the violin, and Mademoiselle Wendling, a singer, of the same family, were all musical professors of great merit in the same service at the same period.

WENLOCK, LITTLE. In 1811, the parish contained 178 houses, and 941 inhabitants.

WENTWORTH. In 1811, this township contained 226 houses, and 1086 persons; *viz.* 542 males, and 544 females.

WEREMOUTH, MONK'S. In 1811, this parish, consisting of five townships, *viz.* Felwell, Hylton, Monk-Weremouth, Monk-Weremouth Shore, and Southwick, contained 832 houses, and 6504 persons; *viz.* 2837 males, and 3667 females. The township of Monk-Weremouth contained 210 houses, and 1091 persons; *viz.* 457 males, and 634 females: and that of Monk-Weremouth Shore contained 458 houses, and 4264 persons; *viz.* 1815 males, and 2449 females.

WESTBURY, in the county of Salop. In 1811, the township contained 112 houses, and 665 persons; *viz.* 348 males, and 317 females: and the parish, comprehending the chapelry of Minterley, and the three townships of Westbury, Westley, and Yockleton, contained 417 houses, and 2195 persons; *viz.* 1124 males, and 1071 females.

WESTERLEY. Add—in WASHINGTON county, containing 1921 inhabitants.

WESTHAVEN, a town of Rutland county, in Vermont, having 679 inhabitants.

WESTMINSTER ABBEY. Its happy construction for music at the commemoration of Handel in 1784, appeared to be such as not only to overlet all the predictions of ignorance and farcicalness, but the conjectures of theory and experience. By some it was predicted that an orchestra so numerous could never be *in tune*; but even tuning to so noble an organ was for once grand, and productive of pleasing sensations. By some it was thought that, from their number and distance, they would never play *in time*; which, however, they did most accurately, and without the measure being beaten in the usual clumsy manner. By others it was prophesied that the band would be so *loud*, that whoever heard this performance would never hear again; however the sound of these multiplied tones arrived as mild and benign at the ears of the audience as they could from the feeble efforts of a few violins in a common concert-room. And, lastly, that from the immense size of the building, no *single voice* had the least chance of being heard by those who had places remote from the orchestra; but luckily this was so far from being true, that not a vocal breathing, however feeble by nature, or softened by art, was inaudible in any part of the wide-extended space, through which it diffused itself in all directions.

There was, doubtless, great propriety in saluting their majesties at their entrance with the Coronation Anthem, yet we could not help wishing that this performance, so different from all others, had opened with some piece in

which every voice and every instrument might have been heard at the same instant; as such an effect might then have been produced as can never be obtained by gradation. Indeed the most sudden and *surprising* effect of this stupendous band was, perhaps, produced by simultaneous tuning; as all the stringed-instruments performed this task *à double corde*, and these strings being all open, their force was more than equal to that of two stopt-strings upon two different instruments.

It is but justice to Madame Mara, in speaking of the effects of a single voice in this immense building, to record that she had not only the power of conveying to the remotest corner of this expanded structure, the softest and most artificial inflexions of her sweet and brilliant voice, but of articulating every syllable of the words with such neatness, precision, and purity, that it was rendered as audible and intelligible as it could possibly have been in a small theatre by mere declamation.

The happy construction of Westminster Abbey for cherishing and preserving musical tones, by a gentle augmentation without echo or repetition, was demonstrated by no part of the commemoration performance more clearly than in that of Miss Abrams, whose voice, though sweet, of perfect intonation, and good quality, was not regarded as theatrical, but such as the Italians denominate *bella voce de camera*, yet in the solo air, which she sung with her usual taste and expression, her voice was rendered more audible in every part of that immense building, than it had ever been in any concert-room in London.

Giardini, envious of the powerful tone of Fischer's hautbois, which could even rival that of his own violin with all its force and sweetness, used to say that Fischer had an *impudence of tone*, but it never produced a more full, rich, and sweet effect than in the solo parts of Handel's fourth hautbois concerto, which he performed with such taste and propriety, as must have convinced all those who heard him that his excellence was not confined to his own very original and ingenious productions. Indeed, one of the Commemoration wonders seems to have been the perfect manner with which the sweet and grateful tone of his *single* instrument filled the stupendous temple of our holy religion, in the performance of this concerto.

WEST PENN, in *Geography*, a township of Northampton county, in Pennsylvania, having 947 inhabitants.

WESTPHAL, in *Biography*, an eminent music merchant of Hamburg, one of the greatest publishers in Germany during the middle of the last century.

WHERWELL, in *Geography*. In 1811, Wherwell with Westover parish, in the hundred of Wherwell, contained 113 houses, and 543 persons; *viz.* 277 males, and 266 females.

WHIFF. Add—See *PLEURONECTES Punäatus*.

WHITE, JOHN, in *Biography*, a Quaker, at whose shop in Newgate-treet ladies were furnished with straw hats. This worthy man was a great collector of ancient rarities, as well as natural productions of the most curious and extraordinary kind; no one of which, however, was more remarkable than the obliging manner with which he allowed them to be viewed by his friends and examined by strangers. Among his old books and MSS, he was in possession of a very scarce and valuable music-book, which once appertained to Dr. Robert Fayrfax, an eminent English composer during the reigns of Henry VII. and Henry VIII.; it was afterwards in the possession of general Fayrfax, and upon his demise became a part of the Thoreby collection, at the sale of which it was purchased by honest John White.

WHITSTABLE, in *Geography*. In 1811, the parish contained 235 houses, and 1249 persons; viz. 616 males, and 633 females.

WILLIAMSBOROUGH, a township of Burlington county, in New Jersey, having 619 inhabitants.

WILTSHIRE. In 1811, this county contained 37,478 houses, and 193,828 persons; viz. 91,560 males (including the local militia 1662), and 102,268 females: 22,657 families being employed in agriculture, and 14,857 in trade, manufactures, or handicraft.

WIMBLETON. In 1811, the parish contained 293 houses, and 1914 persons; viz. 891 males, and 1023 females.

WINDHAM, a town of Maine, in the county of Cumberland, containing 1613 inhabitants.

WINTERTON, in Lincolnshire. In 1811, the parish contained 179 houses, and 821 persons; viz. 379 males, and 442 females.

WINTERTON, in Norfolk. In 1811, the parish contained 112 houses, and 494 persons; viz. 254 males, and 240 females.

WITCHCRAFT. Add—Dr. Henry More published a curious tract, entitled “Antidotes against Atheism,” in which he undertakes to prove the being of a God from the existence of witches, and the power which they possess. See his biographical article.

WITHERITE, col. 2, l. 9, add—The known repositories of this substance are very limited; but it has been observed by Mr. Aikin, in great abundance, in the lower part of a lead-mine in Shropshire, where it occurs in irregular masses, which weigh from forty to two or three hundred pounds, imbedded in heavy spar. The miners call this substance “yellow spar;” not that this is its real colour by day-light, but its transparency is so considerable, that if a lighted candle be placed behind a mass of it, the whole will glow with a yellowish light, by which circumstance the miners distinguish it from “heavy spar.” This latter from the looseness of its texture, being in large masses quite opaque. The colour of the witherite is white, with the slightest possible, if any, tinge of yellow; its fracture is hard, striated, approaching to straight foliated; it is for the most part massive. Mr. Aikin observed only one specimen that presented any indications of a regular crystalline form. In other particulars it agrees with the usual description of this substance. 100 parts of this witherite yields,

Carbonate of barytes	-	-	96.3
— of strontites	-	-	1.1
Sulphate of barytes	-	-	0.9
Silex	-	-	0.5
Alumine and oxyd of iron	-	-	0.25
			99.05
Loss			0.95
			100

Trans. of Geolog. Soc. vol. iv. pt. 2.

WITTENA-GEMOTE, l. 14 from the bottom, r. concionatores.

WODANIUM, in *Chemistry*, the name of a metal recently discovered by Lampadius. This metal was obtained from a species of pyrites, named by Breithaupt *Wodan-kies*, or wodaan pyrites, formed at Topfchau, in Hungary, and which had hitherto been considered as a ore of cobalt. The specific gravity of this mineral is 5.192. Its lustre is metallic. Its colour dark tin-white, passing

into grey or brown. Hitherto it has only occurred massive, and in that state it is full of cavities. Its fracture is uneven. It is brittle and easily frangible, and in hardness surpasses fluor spar, but is inferior to apatite. This mineral contains about 20 per cent. of the new metal united with sulphur, arsenic, iron, and nickel.

Wodanium has a bronze-yellow colour similar to that of cobalt glance, and its specific gravity is 11.470. It is malleable. Its fracture is hackly; it has the hardness of fluor spar, and is strongly attracted by the magnet. It is not tarnished by exposure to the atmosphere at common temperatures, but when heated it is converted into a black oxyd.

The solution of this metal in acids is colourless; or at least has only a slight wine-yellow tinge. Its hydrated carbonate is likewise white. The hydrate of it precipitated by caustic ammonia is indigo blue.

Neither the alkaline phosphates nor arseniates occasion any precipitate when dropped into a saturated solution of this metal in an acid, neither is any precipitate produced by the infusion of nut-galls. A plate of zinc throws down a black metallic powder from the solution of this metal in muriatic acid. Pruffiate of potash throws down a pearl-grey precipitate, &c.

Nitric acid dissolves with facility both the metal and its oxyd, and the solution yields colourless needle-form crystals, which readily dissolve in water.

Such at present is all we know of this metal, and the ore containing it. The name *wodanium* has been given from the old Saxon divinity, *Wodan*.

WOODFORD, in *Geography*, a village in a parish of the same name, in the hundred of Becontree, and county of Essex. In 1811, the parish was returned as containing 310 houses, and 2056 inhabitants; viz. 1051 males, and 1005 females. It is situated on Epping Forest, in the vicinity of Waltham-stow, Wanstead, Layton, &c. which contain a considerable number of well-built houses, admirably adapted for the country-residence of the citizens of London.

WOODVILLE, in *Biography*. Add—Dr. Woodville, always anxious for the promotion of science, and no less disposed to serve the friends whom he esteemed, favoured the editor with several botanical articles for the *Cyclopædia*.

WOOLCOTT, in *Geography*, a township of Orleans county, in Vermont, having 124 inhabitants.

WOOLLETT, WILLIAM, in *Biography*, a very eminent engraver, was born at Maidstone, in Kent, Aug. 27, 1735, and educated in his native town. In early life he exhibited specimens of his graphic talents, which being seen by Mr. Tinney, an engraver, occasioned his being taken by him as an apprentice. His advancement in his profession was very rapid, and so distinguished, that he contributed in a very high degree to the perfection of landscape-engraving. He was also singularly successful in the exercise of his art on historical subjects and portraits. So established and so permanent has been his fame, that the best impressions of his prints, particularly those of “Niobe” and “Phaeton,” “Cebadon and Amelia,” “Cnyx and Alcione,” “The Fishery,” “Vandyke’s Portrait of Rubens,” “The Death of General Wolfe,” and “The Battle of the Boyne,” whenever they occur in collections, are very highly appreciated.

The world was deprived of this eminent artist at the age of 50. His death, which occurred at his house in Upper Charlotte-street, Rathbone-place, May 23, 1783, was announced to the public with the following tribute of respect to his memory. “To say he was the first artist in his profession would be giving him his least praise, for he was a good

a good

a good man. Naturally modest and amiable in his disposition, he never censured the works of others, or omitted pointing out their merits: his patience under the continual torments of a most dreadful disorder upwards of nine months was truly exemplary; and he died, as he had lived, in peace with all the world, in which he never had an enemy. He has left his family inconsolable for his death, and the public to lament the loss of a man whose works (of which his unassuming temper never boasted) are an honour to his country.²⁷ An elegant monument was erected to his memory in the cloisters of Westminster-abbey. Chalmers's Gen. Biog. Diçt.

WOOLWICH, col. 3, l. 11.—The cadets, who are instructed at the royal military academy, were sent for some years to the military college, then at Marlow, now at Sandhurst, as a preparatory school; but that plan, being found attended with disadvantages, was abandoned. The institutions at Woolwich and Sandhurst are now therefore entirely independent; and we may add, that they are different in their nature, and are intended for very different purposes. The institution at Woolwich is confined solely to the instruc-

tion of young gentlemen intended for the artillery and engineer service; that at Sandhurst is supplementary, and designed for the instruction of such as are destined to any other branch of the military service of Great Britain. The education at Woolwich is free of expence, except the little that is incurred by the purchase of the first uniform. The cadets at Sandhurst pay a certain sum annually, bearing an assigned proportion to the rank of their parents, and being only free, as we conceive, in cases where the cadets are orphans, or their fathers subalterns.

WOORARA. See TICUNAS, and *Vegetable Poisons*, under the article POISON.

WOULFE'S APPARATUS. See DISTILLATION and LABORATORY.

WRESTLING. See PALE.

WROXETER, in *Geography*. In 1811, the parish contained 109 houses, and 575 persons; viz. 305 males, and 270 females.

WYMONDHAM, in Norfolk. In 1811 the parish contained 747 houses, and 3923 persons; viz. 1896 males, and 2027 females.

X.

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XANTHOSIA, in *Botany*, from *ξανθος*, yellow, that colour being strongly communicated by the dried plant, to boiling water.—Rudge Tr. of Linn. Soc. v. 10. 301.—Class and order, *Pentandria Digynia*. Nat. Ord. *Umbellatae*.

Ess. Ch. Petals five, ovate. Fruit ovate, striated, separable into two parts. Involucrum of two leaves, single-flowered.

1. *X. pilosa*. Hairy Xanthosia. Rudge as above, t. 22. f. 1.—Native of Port Jackson, New South Wales. Stem shrubby, branched, hairy. Leaves alternate, stalked, oblong, obtuse, sinuated; hairy beneath. Flowers axillary, solitary, on short stalks. Bractæas two, awl-shaped, brittle, at the base of each flower-stalk. Involucrum of two obovate ribbed leaves, half way up the stalk. This plant certainly belongs to the order of *Umbellatae*, however different in inflorescence.

Y.

YELLOW FEVER, l. *penult. dele* for the details of which, see that article in the *Addenda*, and insert—See QUARANTINE, *Addenda*.

YORK, col. 12, l. 1, for death *r.* resignation.

YORK, *New*. See UNITED STATES.

YORK, *New*, city, col. 2, l. 24, add—as some say, 120,000.

Z.

Z O L

ZINJAN, in *Geography*, a town of Persia, in the province of Irak, distant 21 miles, and bearing about N.W. by W. of Sultance. This is a large and prosperous town, capital of the extensive district of Khumfeh, under the government of one of the king's sons. From hence to the banks of the Kizilozian, or golden stream, the distance is 71 miles over an uneven country, full of deep ravines.

ZOLLIKOFER, GEORGE JOACHIM, in *Biography*, an eminent German divine and popular preacher, was born at St. Gall in Switzerland, August the 5th, 1730. His father, who was a practitioner in the law, much esteemed for his integrity and piety, took great care of his education, and by his own counsel and example directed the course of his moral conduct; nor were any of his efforts for the proficiency of his son in knowledge and virtue unavailing. As he was intended for the clerical profession, he was removed, at an early age, from the gymnasium of his native town, first to Bremen, and afterwards to the university of Utrecht, where the theological professors were held in high estimation. Our young student, however, soon discovered that a college education was ill adapted to his aspiring mind; as, in his opinion, it was very unfavourable to all exertions of genius and originality of thought, by levelling the distinctions of nature, by restraining the intellectual capacities to a blind veneration for authorities, and preposterously misleading the judgment so as to take the means of instruction for its end. Possessing a native vigour of mind, which distinguished him through the whole course of his life, he resolved, whilst he attended the public lectures with the rest of the scholars, to cultivate his talents and to pursue his inquiries in his own way. Instead of paying implicit deference to systems and summaries of theology, drawn up in technical and scholastic phraseology, he made scripture and reason his guide, and, as he says in a letter to a friend, "I privately applied myself to the Bible, together with a close investigation of ecclesiastical history; for I found it impossible for me to submit to the trammels of the schools, where derivative doctrines are uniformly transmitted, without examination, by the successive tutors from generation to generation, &c." In the other sciences, as well as in theology, he expresses his dissatisfaction with the means of instruction that were then adopted and invariably practised in the public schools. "The little which I know," as this modest man was heard to say, "I was obliged to teach myself, chiefly after I arrived at years of maturity; for indeed I had but a miserable education." This is not the language of pride and pedantry; as his attention was

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directed to a variety of researches, which, in his youth, the state of education in Germany would furnish him with no extraordinary advantages; and as he is known to have excelled in various departments of general literature and science, besides theology. His attainments in natural history and natural philosophy were very considerable; with the histories, ancient and modern, of the several nations of the world he had cultivated an extensive acquaintance, and in the ancient and modern languages, particularly the Latin, French, and English, he was no ordinary proficient; having made the works of the best poets, orators, and philosophers, the subjects of his particular study. Of Cicero he is said to have been a great admirer; and his eloquence was formed upon the model of that of this celebrated Roman orator. "Oh, my beloved Zollikofer!" says Zimmermann (on Solitude), "what delightful experiences I am constantly feeling of the truth of those lessons you delivered at Leipzig; those truly useful doctrines, which, disregarding a cold and barren theology, inculcate wise and virtuous precepts, that warm and amend the heart. On quitting your auditory, the man of business forgets his vexations, pours his anxieties into the bosom of friendship, surrenders his feelings to the charms of consolation, until his heart is dilated with new hopes and his inquietudes are so far suspended as to enable him to sustain their return with fortitude, or to dispel them with courage. The studious man abandons his recondite and laborious researches, escapes from the labyrinth, and finds in the innocent and simple satisfactions of his family and dependants more real content and happiness than even art and science could afford him." — "Men, in short, of every cast and character, here find by degrees the mind's blest calm, and learn to put on the pure spirit of the gospel of Christ."

Soon after he had finished his academical course, he settled, as a preacher, at Murten in the Pays de Vaud; and in a little while removed to a more considerable place at Monstein in the Grisons, and afterwards to Ifenburg. But neither of these places afforded sufficient range for his talents and zeal; and therefore in the year 1758, at the age of twenty-eight, he accepted an invitation to be one of the German preachers at the church of the evangelically reformed at Leipzig. In this connection he availed himself of the opportunity which his moderate labours afforded him, of giving that perfection to his discourses which was the object of his wishes. Accordingly, the universal approbation which he received on the part of his numerous congregation from his first settlement constantly augmented from

from day to day, and adhered to him to the very last hour of his addressing them. A considerable number of young members of the university eagerly pressed to hear his discourses, learning from him, by example, how a subject should be studied and discussed, in order to contribute, in any remarkable degree, to the advancement of wisdom and virtue among mankind by the oratory of the pulpit.

It is therefore natural to hope, that Zollikofer's genius will continue to operate not only throughout his native country, but likewise over many provinces of Germany, by means of these his disciples, who are thus prepared for diffusing truth, and virtue, and happiness among their fellow-creatures to the latest posterity.

Several volumes of his excellent discourses have for some years been in the hands of the public, and are in high and deserved repute wherever the German language is understood, by all persons to whom religion and virtue are objects of serious concern; to which the number of editions through which they have passed, and which are continually published, bear ample testimony, as well as to the taste and judgment of the times with regard to compositions of this nature. A German writer says, that "Zollikofer was one of the first pulpit orators of his time. His sermons were distinguished by clearness of ideas and warmth of feeling. In regard to form, they were the most complete productions of the kind which had appeared, at that time, in Germany. The diction is copious and varied; the periods harmonious, and the whole acquires great animation from the connection of the ideas and the transitions." Of his theological creed we can form no decided opinion. His discourses are practical, and not controversial; and it must be allowed that whatever were his sentiments on disputed topics, they are adapted to inform the understanding, to impress the heart, and to regulate the temper and conduct. Some have suspected that he belonged to the modern German school of theologians. Professor Eichorn pronounces his eulogy in the following strain: "Zollikofer, on account of the philosophical colouring combined with popularity, which he knew how to give to his discourses, was an orator for the highest ranks. He unfolded the doctrines and principles of Christianity with philosophical accuracy; exhibited them in a concise and impressive manner, clothed in pure and simple language, without artificial ornament; and endeavoured to affect the heart by convincing the judgment."

Zollikofer, considering that psalmody and prayer form an essential part of public worship, undertook to make a collection of spiritual songs for the use of his congregation, on a plan more suitable to the purpose, and more edifying than the old one. In doing this he availed himself of the advice and assistance of his judicious friends, both in regard to the improvement of the forms, and to the proper selection of hymns from the modern poets, particularly Gellert, Cramer, and Klopstock. This performance appeared in the year 1766. His discourses and prayers for the use of public and family worship were published in 1777, and were followed in 1785 by his exercises of devotion and prayers for the private use of reflecting and sincere Christians. The Rev. W. Tooke, F.R.S. has done great service to the cause of rational religion, by the translation of 10 vols. 8vo. of Zollikofer's Sermons, and of his Devotional Exercises in 1 vol. 8vo.

Having said so much concerning the professional character and performances of Zollikofer, we cannot forbear adding a few particulars from the account that lies before us, with regard to his private and social disposition and conduct. "In humility and retirement, he pursued his path of life; never wishing to shine, his only aim was to be useful; because in the exercise of that stern virtue which he taught he

found his supreme delight. The poor and destitute, especially those of his congregation, beheld in him a father and a friend; though his bounty was by no means confined to them, it also extended to those of other communions, relieving them either by his own donations or through application to others."—"His advice, his judgment, his intercession with others, his admonitions, his consolation in misfortune, were at the service of all who applied for them, and he even went before their requests. Young men desirous of knowledge, eagerly sought his acquaintance, and all those who enjoyed that benefit have honestly confessed, that they derived from it material improvement both in heart and mind. Whatever he said was true; every word he uttered might be relied on as conveying the real sentiments of his heart; arrayed in the simple majesty of truth, he fought no other covering: and never did he commend or approve from complaisance any thing that was contrary to the conviction of his own mind, or that he saw could not be approved upon the strictest rules of morality. His gravity was attractive and engaging, charity itself was in its smiles, his conversation entertaining, often animated, his equal cheerfulness amiable and inoffensive, and his railery, in which he very rarely indulged, the mildest possible. To a very considerable compass of literary attainments and great brilliancy of imagination, were added in the character of Zollikofer, the most undeviating rectitude, the most amiable disposition, and the most prepossessing manners. The whole tenor of his life was one pure, uninterrupted, captivating harmony of virtue, and the sweet enjoyment of the felicities arising from it. Among his other satisfactions he had that of being universally esteemed, as of necessity it could not be otherwise. That happy mixture of seriousness and dignity with gentleness and affability; his own strict course of virtue combined with so much indulgence and candour towards the failings of others; his heartfelt and firm conviction of the great truths he taught, which manifested itself in all his actions, in the whole tenor of his conversation as well as in his discourses from the pulpit, without entertaining the slightest intolerance towards such as differed from him in opinion, or arrogating the smallest superiority over those who possessed not the faculty of thinking for themselves, or of fully comprehending every truth; his unwearied zeal to lead his auditors to the rigorous exercise of virtue, in his demands however never disregarding the rights of humanity concerning what they could or could not do in these or the other circumstances; his impartial estimation of mankind, justly discriminating the opinions and principles upon which they acted, carefully tracing out their good qualities, and heartily rejoicing in every advantageous discovery of that nature—let the reader contemplate all this as combined in the character of Zollikofer, and then pronounce, whether real undissimulated veneration, the general esteem of all ranks and classes of persons must not as inseparably have attended his wisdom and virtue as the shadow follows the substance. Even the wanton wit of those who, in the judgments they pass on the ministers of religion, are not ashamed to set aside the respect that is due from man to man, was awed into silence at the name of Zollikofer."

He was twice married, and in both connections he was truly happy, though both proved childless. For about a year before his death his faculties began to decline, and he wished to resign his office of preacher, and to retire to the place of his nativity in Switzerland; but at the request of his congregation, who for the sake of retaining him expressed their willingness to be satisfied with one discourse in a fortnight, he was induced to remain in his station. At length within a few weeks before his death he was obliged to
devolve

ZOLLIKOFER.

devolve the charge of preaching on another person. His last illness was very painful; but he bore it with the patience of a philosopher, and the resignation of a Christian, looking by a steady eye of faith and hope beyond the grave to a world of retribution. He obtained a release on the 22d of

January 1788, and was buried on the 25th. The whole of his numerous congregation, together with some hundreds of young students of the university, and numbers of his auditors of the Lutheran communion, attended his remains to the grave, with every token of unfeigned sorrow.

THE END.

CATALOGUE AND ANALYSIS

OF THE

PLATES TO REES'S CYCLOPÆDIA;

COMPREHENDING

THE GENERAL TITLES, THE ORDER AND NUMBER OF THE PLATES AND FIGURES, AND
THE PARTICULAR SUBJECTS,

TOGETHER WITH

OCCASIONAL EXPLANATIONS, AND CORRECTIONS OF ERRONEOUS REFERENCES.

PORTRAIT OF DR. REES—FRONTISPIECE TO Vol. I. of the Cyclopædia.

PLATES. VOL. I.

AGRICULTURE—ASTRONOMICAL INSTRUMENTS.

AGRICULTURE.

- | | |
|---|---|
| <p>PLATE</p> <p>I. Fig. 1. Common Barn
2. Double Barn
3. Improved Barn
4. Open Barn
5. Dutch moveable Barn</p> <p>II. Fig. 1. Barn and Threshing Machine, Front
Elevation
2. Ground Plan
3. End Elevation
4. On a larger Scale, Front Ele-
vation
5. Ground Plan
6. End Elevation
7. With moveable Floor and Racks
for feeding Cattle</p> <p>III. Fig. 1. Blasting Stones, Instrument for
2. Cart, Clofe
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5, 6. Drag
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9. Quarry</p> <p>IV. Fig. 1. Calf Pen, Ground Plan
2. Section
3, 4. Cattle Shed, Single
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7. Curd cutter</p> <p>Vol. XXXIX.</p> | <p>PLATE</p> <p>V. Fig. 1. Cattle Shed, Elevation
2. Latch holder
3. Cattle Shed, Stall Divisions
4. Stalls, Ground Plan
5. Elevation of the rear
6. Section
7. Stone Troughs. (<i>Insert A at the
upper end, and B at the lower
end of the dotted line.</i>)
8. Stall, Section</p> <p>VI. Fig. 1. Cottage, Farm, Double, Elevation
2. Ground Plan
3. Circular, Elevation
4. Upper Floor
5. Ground Plan
6. Circular Elevation
7. Upper Floor
8. Ground Plan
9. Small
10. Ditto, two Rooms
11. Ditto, three Rooms
12. Double, Elevation
13. Ditto, Ground Plan
14. Ditto, by Wyatt
(<i>Plate VI. is referred to as Plate VIII.</i>)</p> <p>VII. Fig. 1. Ornamental Cottage, Elevation
2. Ground Plan</p> |
|---|---|

AGRICULTURE.

- PLATE VII. Fig. 3. Ornamental Cottage, Upper Floor
 4. Ditto, another kind, Elevation
 5. Ground Plan
 6. Upper Floor
 7. Ditto, another kind, Elevation
 8. Ground Plan
 9. Upper Floor
- VII. Fig. 1, 2. Chaff-cutter, Salmon's, by Rowntree
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- VIII. Fig. 1. Cheefe-prefs, common
 2. Improved
 3. Churn, by Hartland
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 6. Beaters to
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(For Plate VIII. Farm Cottages, See Plate VI.)
- IX. Fig. 1, 2. Cottage Fire-place
 3, 4. Staircase
 5. Bed Room
 6, 7. Couch grafs Drag, by Amos
 8. Coulter
 9. Rake by Do. Side View
 10. Plan
- X. Fig. 1. Cultivator
 2. Corn, used in Effex
 3. Bean, by Rogers
 4. Weltern's double
 5. Improved
- X. Fig. 1. Embankment, common form
 2. Improved form
 3. Easy floping
 4. Upright rocky
 5. Improved
 6. Walled
 7-9. Improved
 10. With Brush-wood
 11. With projecting Point
- XI. Fig. 1. Embankment against the Sea
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 10, 11. Scale of the Mould
- XI. Fig. 1. Cyder Mill
 2. Hand
 3. Prefs, large
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- XII. Fig. 1. Dairy Houfe, Plan
 2. Window End
 3. Ground Plan
 4. Latticed Window
 5. Infide View
 6, 7. at Woburn Park
- XIII. Fig. 1, 2. Dairy at Woburn
 XIII. Grafs and Dairy Farm Buildings.
 Fig. 1. Grafs and Dairy Farm Houfe, Elevation
 2. Ditto, Houfe, Ground Plan
 3. Outbuildings
 4. Dairy Farm Houfe, Elevation
 5. Houfe, Ground Plan
 6. Outbuildings

(Plates XIII. and XIV. have been wrongly numbered. The Plate numbered XIII. is referred to as Plate XIV.; and the Plate numbered XIV. is referred to as Plate XIII.)

AGRICULTURE.

- PLATE XIV. Corn and mixed Farm Buildings.
 Fig. 1. Farm Houfe, Elevation
 2. Ditto, Houfe, Ground Plan
 3. Outbuildings
 4. Mixed Farm Houfe, Elevation
 5. Houfe, Ground Plan
 6. Outbuildings
- XV. Fig. 1. Farm Houfe, small, Elevation
 2. Ground Floor
 3. Chamber Floor
 4. Larger, Elevation
 5. Ground Floor
 6. Ditto
- XVI. Fig. 1. Farm Yard, Plan of Square Farm
 Yard, at Broom Fields
 2. Ditto, at Eskmount
- XVII. Plans of Angular and Circular Farm
 Yards.
 Fig. 1. Farm Yard, Angular
 2. Circular
- XVIII. Fig. 1-16. Fences
 XIX. Fig. 1-12. Ditto
 XX. Fig. 1-12. Ditto
 XXI. Fig. 1-12. Ditto, Chain Fences, &c.
 XXII. Fig. 1-12. Ditto, Wall Fences, &c.
(This Plate is wrongly numbered XXI.)
- XXIII. Fig. 1. Flax Brake
 2. Teeth
 3, 4. Foot Brake, Elevation
 5. Ground Plan
 6, 7. Heckle
 8. Rippling Comb
 9, 10. Stock, End View
 11. Scutcher
- XXIV. Fig. 1. Granary, Section
 2. Front Elevation
 3, 4. Spouts
(Fig. 4. is marked on the Plate "Fig. 5. Plan.")
 5. Hoppers
- XXV. Fig. 1-5. Drill Machine, Salmon's
 XXVI. Fig. 1-3. Machine, Charles's, for levelling
 Land
 4. For lifting Stones
 5. For raising Water
 6. Sergeant's, for raising Water
 7. Ditto, Section of the Bucket
(This Plate is marked "Plate Machines, No. 2.")
- XXVII. Grazing, and Harrows
 Fig. 1. Harrow, common
 2. Improved
 3. Double-jointed
 4. Ditto, with top bar
 5. Iron
 6. Grafs
 7. Grafs Sod-cutting Plough
 8. Crib
- XXVIII. } Mole catching.
 XXIX. }
 (XXVIII.) Fig. 1. Detached Mole-hill
 2. Two Mole-hills
 3. Three ditto
 4. Six ditto
 5. Imperfect hills
 6. Dry ditto
 7. Fresh ditto
 8. Wooden trap
 9. Bottom of ditto

AGRICULTURE.

- PLATE
(XXVIII) Fig. 10. Fall of Wooden Trap
11. Mole Pot
12. Mole Trap
(XXIX.) Fig. 1. Mole Plough, by Scott
2. Mole Plough, by Lambert
3. Machine for drawing
XXX. Fig. 1. Swing Ploughs, Rotheram
2. Small's Chain Plough
3. Lord Somerville's
4. Suffolk Iron Plough
5. Duckett's Skim Coulter
6. Lord Somerville's Double Furrow
XXXI. Fig. 1. Wheel Ploughs, Beverstone Plough
2. Hampshire Iron Plough
3. Norfolk Plough
4. Kentish Turnwrit Plough
5. Single Horse Plough
XXXII. Fig. 1. Paring Ploughs and Tools.
1. Cheshire Paring Plough, Furrow side View
2. Ditto, Land side View
3. Breast Plough
4. Common Paring Plough
5. Paring Shovel
6. Mattock
7. Twobill for Paring
8. Paring Adze
9. Sock
XXXIII. Fig. 1—17. Pist; Implements for Pist or Ramm'd Earth Buildings
XXXIV. Fig. 1—32. Gates, Hangings and Fastenings
XXXV. Fig. 1. Grasses, Sweet-scented Vernal
2. Meadow Foxtail
3. Smooth-stalked Meadow
1^a Rough-stalked Meadow
2^a Meadow Fescue
3^a Crested Dog-tail
1^b Sheep Fescue
2^b Hard Fescue
3^b Flat Meadow
1^c Marsh Meadow
2^c Knot Grass
3^c Common Ray
1^d Red Clover
2^d Saintfoin
3^d Lucern
1^e Trefoil
2^e Rough Cocksfoot.
3^e Dutch Clover
XXXVI. Fig. 1. Kiln, Count Rumford's Lime Kiln
2. Rawlson's
3. For General Use
4. Pepper's Malt Kiln, Ground Plan
5. Ditto, Section
6. Plan of the Floor
7. Section of the Chimney
XXXVII. Fig. 1. Berne Machine, No. 1—3.
2. Borens, No. 1—4
3. Fan Machine
4. Halter Calk, Spring Staple for Halt-tering
5. Hay Sweep
6. Lactometer
7. Lime-stone Pounding Machine
8. Ox Shoeing Machine

ALGEBRA.

- PLATE
XXXVIII. Quarries, Pits, Mines, &c. draining them.
Fig. 1. Section of Drains
2. View of the Side of a Hill, with Water Course, &c.
3. Quarries, Surface View
4. Section
5. Quendon Water Barrow
6. Potatoe Harrow, Set Scoops, &c.
XXXIX. Fig. 1. Conitruition of Ponds
2. 3. Potatoe Harrow
4. Scoop, Dublin
5. Slark's
6. Machine for discharging Overplus Water of Ponds
7. Fixed Pig or Swine Cafe
8. Moveable Ditto
XL. Fig. 1. Piggery at Woburn, Ground Plan
2. End Elevation
3. Side Elevation
4. Feeder
ALGEBRA.
I. Palpable Arithmetic and Writing.
1. Fig. 1. Digits or Figures
2—8. Arithmetical Tables, &c. &c.
II. Fig. 7—9. Neper's Bones. See MISCELLANY, Plate I.
ANALYSIS.
Asymptote
(The reference under this article to ANALYSIS, fig. 1. should be Plate I. fig. 2.)
I. Fig. 1. Cissoïd.
2—9. Conchoïd
10—20. Construction
(The figure numbered 20 is not the proper one. The figure referred to is inserted in GEOMETRY, Plate IX. fig. 2. CONSTRUCTION.)
II. Fig. 21, 22. Cotesian Theorem
23. Crown
24. Curve, Cautic
25. Diacaustic
26. Characteristic, Triangle of a
Fig. 18. Element
3, 4. Cylinder. (These figures are referred to as in GEOMETRY, Plate IV.)
III. Fig. 1—13. Curvature
IV. Fig. 1—16. Curve
(This Plate is numbered VI. and referred to as Plate VI. under the article CURVE.)
V. Fig. 1—8. Cycloid
(Fig. 1—8. have also been engraved by mistake on a separate Plate, under the head CYCLOID.)
9—11. Epicycloïd
VI. Fig. 1—10. Evolute
(This Plate is numbered V. and referred to as Plate VI. The reference in the article EVOLUTE, to fig. 35. in this Plate, should be to fig. 2.)
VII. Fig. 1—4. Fluxion
5. Analytic Function
(This is a wrong figure inserted by mistake. The proper figure is in GEOMETRY, Plate IX. fig. 3. HYPERBOLIC LOGARITHMS.)
6—8. Analytic Function

ANATOMY.

- PLATE
VIII. Fig. 1—10. Analytic Geometry
(*This is numbered Plate VII.*)
- IX. Fig. 1—4. No. 1. Gyration
4. No. 2—8. Harmonic Curve
- IX. & }
X. (IX.) } Fig. 1—17. Iperimetry
(*These figures are referred to as GEOMETRY, Plate IX.*)
- (X.) Fig. 1. Helicoid
2—7. Infection
- XI. Fig. 1. Lemniscate
2. Logarithmic, Atmospheric
3. Curve
4. Logistic Curve
5. Spiral
6. Magic Square of Squares
7. Circle of Circles
- XII. Fig. 1—23. Locus
- XIII. Fig. 1. Variation. *See NAVIGATION, Plates I. & II. fig. 8. Plate II. fig. 9. Ditto.*
2. Ditto
3. Parabolic Cuneus
4. Analytic Parallelogram
5. Progreffion
6. Quadratic Equation.
7—9. Quadratrix
(*For Ratio, referred to fig. 9, see fig. 21.*)
10—20. Quadrature
21. Ratio. (*Referred to as fig. 9.*)
(*For Rectification, referred to Plate XIII. fig. 10—14, see Plate XIV. fig. 1—5.*)
- XIV. Fig. 1—5. Rectification
(*Referred to as Plate XIII. fig. 10—14, The reference under SOLIDITY, to fig. 1—4, of this Plate, should be to fig. 7—10.*)
6. Sections following
7—10. Solidity
(*Referred to as fig. 1—4.*)
11. Sub-tangent
12—15. Superficies
(*These figures are referred to as fig. 6—9 respectively.*)
16—22. Tangent
- XV. Fig. 1—6. Tangent
(*See GEOMETRY, Plate IX. fig. 14—19, where these figures are inserted.*)
For Analytic Parallelogram, referred to as on ANALYSIS, Plate XVII. see Plate XIII. fig. 4.

ANATOMY.

- I. Organs of Sense
EYE. Plate I. Fig. 1—5.
(*Plate I.* fig. 1—5. The same in Outline*)
- II. EYE. Plate II. Fig. 1—11.
(*Plate II.* fig. 1—11. The same in Outline*)
- III. EYE. Plate III. Fig. 1—15.
(*Plate III.* fig. 1—15. The same in Outline*)
- IV. EYE. Plate IV. Fig. 1—5.
(*Plate IV.* fig. 1—5. The same in Outline*)
- [IV.] EYE. Plate IV. Fig. 4
(*This is fig. 4, of the preceding Plate, on a larger scale, and therefore not numbered as a separate Plate.*)

ARCHITECTURE.

- PLATE
V. EAR. Plate I. Fig. 1—13.
(*Plate I.* fig. 1—13. The same in Outline*)
- VI. EAR. Plate II. Fig. 1—13.
(*Plate II.* fig. 1—13. The same in Outline*)
- VII. EAR. Plate III.
- VIII—
XVI. } Myology.
XVII. } Osteology, Skeleton
(*Numbered on the Plate XVI.*)
- XVIII. Osteology, Skeleton
- XIX. Cranium, Plate I.
XX. Plate II.
- XXI. Viscera, Plate I. Fig. 1, 2.
(*Front*) Plate II. Fig. 1, 2.
(*Back*) Plate III. Fig. 1, 2.
- XXIII. (*Numbered also Viscera, Plate II.*)
- XXIV. Viscera, Plate IV. Fig. 1—4.

ANATOMY, COMPARATIVE.

- I. & II. Fig. 1—3. Anatomy of Birds
III. Fig. 1, 2. Skeleton
(*Numbered Plate IX.*)
- I—III. Anatomy of the Horle
IV. Stomach
Intestines

The other Plates referred to in the several articles on Comparative Anatomy, comprised in the former part of the Cyclopædia, including the articles FEATHERS, FISHES, HAIR, HORNS, INCUBATION, MAMMALIA, &c. are unavoidably omitted. Dr. Martney, by whom these articles were furnished, has stated, that "he has found it impossible to procure, within any reasonable time, the drawings required for those Plates, in consequence of his removal from London, and of the indispensible occupations attending the laborious duties of his present professorship in the University of Dublin;" the editor has deemed it preferable, upon the whole, in this dilemma, to omit these Plates altogether, rather than to give them in an imperfect and unconnected manner; especially as he could not have given them, even in this defective state, without charging the work with a heavy additional expense, and further delaying its completion to a distant and indefinite period. He has had the less difficulty in coming to this determination, in consequence of no reference to Plates having been made in any of the articles on Comparative Anatomy, since Dr. Martney's removal to Ireland deprived the editor of his assistance in this department.

ARCHITECTURE.

- I. Fig. 1. Attic Base, Temple of Jupiter Olympius at Athens
2. Temple of Minerva Polias at Athens
3. Doric Base, according to Vignola
4. Ionic Base, Ditto
5. Doric Capital, from the Portico of Philip in the Island of Delos
6. Ditto, from the Temple at Corinth
7. Ionic Capital, from the Temple of Minerva
- I. & III. Baths of Caracalla. (*See Plate XXXVI. XXXVII.*)
- II. Titus. (*See Plate XXV.*)

ARCHITECTURE.

PLATE II.	Roman Basilica, from Vitruvius Plan and Elevation
II.—V.	Amphitheatre <i>(These Plates comprise Eight Plans and Sections from the Amphitheatres of Verona and the Coliseum, which are referred to in the article AMPHITHEATRE as ARCHITECTURE, Plates II. to IX. respectively.)</i>
III.	Basilica at Pæstum <i>(This edifice being of doubtful authority, the Plate has been omitted. It is represented in Wilkins's Antiquities of Magna Græcia, where it is called a "Pseudo-dipteral Temple.")</i>
IV.—V.	Basilica of St. Peter's. See Plate XXXV.
VI.	Arch Fig. 1—7.
VII.	Dome Fig. 1—7. <i>(This is marked DOME, Plate I.)</i>
VIII.	Chimney and Dome. Dome. Fig. 1. No. 1, 2. Fig. 2. No. 1, 2. Fig. 3. No. 1—4.
(VIII. A)	Fig. 1. No. 1—4. Fig. 2. Fig. 3. No. 1, 2. Fig. 4. No. 1, 2. Fig. 5. No. 1, 2. <i>(Plate XLI. CHIMNEY, is joined with this.)</i>
IX.	Fig. 1. Arch of Adrian at Athens 2. Septimius Severus at Rome
X.	Fig. 1. Arch of Constantine 2. Titus 3. Section
XI.	Basilic
XII.	Circus of Caracalla <i>(XI. and XII. are on the same Plate.)</i>
XIII.	Doric Order from the Parthenon
XIV.	Tuscan Order from the Church in Covent Garden
XV.	Fig. 1. Doric Order, Temple at Delos 2. of Philip at Delos 3. of Ægefta 4. of Jupiter at Selinus 5. at Selinus
XVI.	according to Sir W. Chambers
XVII.	Fig. 1. Pseudo-dipteral Temple at Pæstum 2. Temple of Theseus at Athens 3. Temple of Concord at Agrigentum 4. Temple of Jupiter Pa- nellenius in Ægina 5. Temple of Minerva at Athens
XVIII.	Fig. 1. Theatre of Marcellus at Rome 2. Hexastyle Temple at Pæstum 3. Temple of Jupiter Neme- zus, between Argos and Corinth 4. Temple of Juno Lucina at Agrigentum 5. The Agora at Athens
XVIII a.	Fig. 1—14. Doric Order
XIX.	Temple of Pandrosus, at Athens
XX.	Interior of a Hindoo Temple, at Deo, in Bahar
XXI.	Mouldings, &c. Grecian and Roman

ARCHITECTURE.

PLATE XXI.	Mouldings, Fillet, Lintel, Annulet, or Square Astragal or Bead Cyma, Cyma Recta, or Cymatium Lintel and Falcia Echinus Ovolo, or Quarter Round Enriched Sections of Inverted Cyma, Talon, or Ogee Talon enriched Astragal, or Bead enriched Doric Annulets Cavetto or Hollow Torus Scotia or Trochilos Cantalive Corinthian Modillion Soffit of a Modillion Panel between the Corin- thian Modillions in the soffit of the Corona Flower in the Corinthian Abacus
XXII.	Joinery. Fig. 1—7, No. 1. Fig. 7, No. 2—5. Fig. 8, No. 1—5.
XXIII.	Doors. Fig. 1—11
XXIV.	Doors. Fig. 1—5, No. 1, 2. <i>(Marked DOOR Plate A B.)</i>
XXV.	Painting from the Baths of Titus <i>(Referred to as Plate II.)</i>
XXVI.	Egyptian Capitals. Fig. 1—8
XXVII.	Fig. 1—4. Corinthian and Composite Capitals
XXVIII.	Ionic Order, from the Temple of Mi- nerva Polias, at Priene
XXIX.	Corinthian Order, from the Temple of Jupiter Stator, in Rome
XXX.	Plan and Elevation of a Portico at Latopolis
XXXI.	Eastern Portico of the Parthenon on the Acropolis of Athens <i>(Marked ARCHITECTURE, Plate A.)</i>
XXXII.	Bridges. Fig. 1, 2.
XXXIII.	Bridges. Fig. 1—6.
XXXIV.	Wooden Bridge, at Walton in Surry
XXXV.	Basilica. Incorporated Plans of the Basilica of St. Peter's, and of the modern St. Peter's of the Vatican. The Plan, with the parts more deeply shaded, is that of the Old Basilica. The parts which are more lightly shaded, indicate the larger modern edifice, the Church of St. Peter's <i>(The two Plans here exhibited together in one view are referred to as ARCHITECTURE, Plates IV. & V. in the article, BASILICA. But, instead of giving the two Plans separately, it was deemed preferable, upon the whole, to give Costaguit's own incorporated Plans of the two Edifices.)</i>
XXXVI.	Baths of Caracalla. Plan
(Referred to as Architecture, Plate I.)	
XXXVII.	Ditto. Section <i>(Referred to as Architecture, Plate III. XXXVI. and XXXVII. are on the same Plate.)</i>

ARCHITECTURE.

- PLATE
 XXXVIII. Bridge. Fig. 1—6.
 XXXIX. Bridge, Oblique Arch. Fig. 1—10.
 XL. West Door of the Cathedral of Car-
 rara
(The figures on the capital, on the right of the door, are represented on a larger scale in BASSO RELIEVO, Plate IV. fig. 1.)
 XLI. Chimney. Fig. 1—6.
(This Plate forms a part of ARCHITECTURE, Plate VIII. There are some omissions in the small letters of reference on fig. 5. which the reader will easily supply.)
 XLII. Carpentry, Roofs. Fig. 1—10.
 XLIII. Roofs. Fig. 1—6.
 XLIV. Roofs. Fig. 1—10.
 XLV. Fig. 1. No. 1—4.
 Fig. 2, 3.
 XLVI. Fig. 1. No. 1, 2.
 Fig. 2. No. 1—6.
 Fig. 1—3.
 XLVII.
 XLVIII. to LVII. *(There are no Plates of these Numbers. Plate XLVIII. was, by mistake, numbered LVIII. and the following numbers were continued accordingly.)*
 LVIII. Roofs. Fig. 1, 2. Fig. 3. No. 1, 2.
 Fig. 4, 5. No. 1—4.
 LIX. Roofs. Fig. 1. No. 1—3. Fig. 2.
 Fig. 3. No. 1, 2.
 LX. Carpentry. Fig. 1—8. Fig. 9. No. 1—6.
 LXI. Carpentry. Fig. 1. No. 1, 2. Fig. 2, 3.
 Fig. 4. No. 1, 2. Fig. 5. No. 1, 2.
 Fig. 6. No. 1, 2. Fig. 7, Fig. 8.
 No. 1, 2. Fig. 9. No. 1—3. Fig. 10. No. 1, 2.
 LXII. Carpentry. Fig. 1. Fig. 2. No. 1—3.
 Fig. 3—6. Fig. 7. No. 1, 2.
 Fig. 8. No. 1, 2.
 LXIII. Carpentry. Fig. 1—3. Fig. 4. No. 1—4.
 Fig. 5—8. Fig. 9. No. 1, 2. Fig. 10.
 No. 1, 2. Fig. 11.
 LXIV. Carpentry. Fig. 1. Fig. 2. No. 1—7.
 Fig. 3. No. 1, 2. Fig. 4. No. 1, 2.
 LXV. Bridges. Fig. 1—4.
 LXVI. Centres. Fig. 1—3.
 LXVII. Fig. 1—3.
 LXVIII.
 LXIX. Geometrical Principles of Carpentry.
 Fig. 1—3. Fig. 4. No. 1, 2. Fig. 5, 6.
 LXX. Ditto. Fig. 1, 2. Fig. 3. No. 1—3.
 Fig. 4. No. 1, 2. Fig. 5.
 LXXI. Ditto. Fig. 1. No. 1, 2. Fig. 2. No. 1, 2. Fig. 3. No. 1, 2. Fig. 4. No. 1, 2. Fig. 5—8.
 LXXII. Ditto. Fig. 1—7. Fig. 8. No. 1, 2.
 Fig. 9. No. 1, 2.
 LXXIII. Ditto. Fig. 1. No. 1, 2. Fig. 2. No. 1, 2. Fig. 3, 4.
 LXXIV. Ditto. Fig. 1. No. 1—6. Fig. 2. No. 1, 2. Fig. 3.
 Groin. Fig. 1—5.
 LXXIV.* Geometrical Principles of Carpentry
 LXXV. Ditto. Fig. 1. No. 1—7.
 LXXVI. Ditto. Fig. 1—6.
 LXXVII. Ditto. Fig. 1. No. 1—6. Fig. 2.
 No. 1—6.

ASTRONOMY.

- PLATE
 ARMOUR.
 I. Ancient Bronzes
 A. In the Collection of P. Knight, Esq.
 B, C. In the British Museum
 D. In the Collection of P. Knight, Esq.
 II. Armour. Fig. 1, 2. From Denon
 3, 4. the Tufcan Gallery
 5. a Gem
 6. From Sir W. Hamilton's Vases
 7. the Tufcan Gallery
 8. a Bronze in the British Museum
 9a. From the Tufcan Gallery
 9, 10. From Sir W. Hamilton's Vases
 11. From the British Museum
 12. Bartoli's Triumphal Arches
 13, 14. From the British Museum
 15. From Bartoli's Triumphal Arches
 16—19. From the British Museum
 20. From Bartoli's Triumphal Arches
 III.
 IV. Ancient Armour
 Fig. 1, 2. Saxon
 3, 4. Danish
 5. Norman
 6. Plate Armour from the Monument of Thomas Beauchamp, Earl of Warwick
 V. Fig. 1. Henry VIII's Armour
 2. Croupiere or Buttock Armour
 3. Robert Dudley, Earl of Leicesters, in Tilting Armour
 4. Half-tilting Habit of Prince Henry
(IV. and V. are on the same Plate.)
 ARTILLERY.
 I. and II. Fig. 1. Arries, or Battering Ram
 2—4. Catapulta, used by Lord Heathfield at the Siege of Gibraltar
 I. Fig. 1—13. Carriages
 II. Fig. 14—20. Carriages
 III. Fig. 21—33. Carriages
 IV. Fig. 34—44. Carriages
 V. Fig. 45—61. Carriages
 Artillery Encampment
(The Plate which has this title, is CAMP, Plate III.)
 ASTRONOMY.
 I. Fig. 1, 2. Aberration
 3, 4. Culmination
 5, 6. Altitude
 7. Refraction of Altitude
 8. Parallax of Altitude
 9*, 10*. Anomaly
 11*. Arc
 12. Area
 13. Argument

PLATE

- II. Fig. 9. General View of the Solar System
 10. Proportional Magnitudes of the Primary Planets
 11. Proportional Magnitudes of the Sun, as seen from the Primary Planets
- III. 14. Armillary Sphere
 15—17. Ascension
 18, 19. Axis
 20, 21. Azimuth
 22. Chronology
(This Plate is numbered Plate II.)
- IV. Fig. 23—36. Comet
- V. Fig. 37. Commutation
 38—42. Crepusculum
 43. Culmination
 43. Day
 44, 45. Declination
 46. Demi Crofs
- VI. Fig. 47—52. Degree
 53. Degree measured in 1736.
 54. Measured in 1803
- VII. Fig. 55—67. Degree
- VIII. Degree
- IX. Fig. 60. Density
 61, 62. Depreffion
 63. Deviation
 64—66. Diameter
 67. Double Star
 67*. Dichotomy
 68—70. Earth.
(Insert Q above p on the right-hand Globe, at the end of the line C Q, and insert S on the middle of the line p s p.)
- X. Fig. 71—73. Earth.
(Fig. 71. x. should be over the Globe on the left of the figure, and Y under the Globe on the same side, and t should be under the Globe on the right. Fig. 73. Instead of d read b, at the bottom of the line B C
 74. Fergufon's Eclipsareon.
(Insert C on the brass arch below e)
 75. Eclipse.
(For C read c, and for c read C)
 76. Eclipse
(Insert b at the end of the line A c)
 77. Eclipse
(Insert A at the upper end of the line L t, and dele C)
- XI. Fig. 78. Eclipse
 79. Eclipse
(This figure is, by an error of the press, referred to as fig. 97.)
 80, 81. Eclipse
(These figures are not referred to, but the theorems to which they pertain, follow immediately after the theorems belonging to fig. 79.)
 82—89. Eclipse
- XI. No. 2. Fig. 90—98. Eclipse
- XII. Fig. 99. Eclipse, Hindū Computation
 100. Mr. Pond's Machine to illustrate the Phenomena of Eclipses
(The letters of reference have been omitted in this Plate; but the Machine will easily be understood from inspection.)
 101. Ecliptic

PLATE

- XII. Fig. 102. Elevation
 103. Elliptic
 104. Elongation
 105. Epicycle
 106. Equal Altitude
 107—109. Evection
(The letter A is wanting at the top of the line TBC. In the theorem (twice) for "the small circle ACB," read "AGB.")
 109.* Equator
- XII. Fig. 100. Ecliptic.
(The reference to N V, fig. 100, should be to N V, fig. 102.)
 102. Poles of the Ecliptic, Equator, and Orbs of Venus
 103.* Obliquity of the Ecliptic
(Referred to as fig. 103.)
 107.* Equation of the Centre
 108. No. 1, 2. Time
 109.** Time
- XIII. Fig. 110—113. Excentric
 114, 115. Galaxy
(The reference to fig. 114, should be to fig. 115; and the reference to fig. 115, should be to fig. 114.)
 116. Geocentric
- XIV. } Fig. 117. Globe, method of exhibiting Stars,
 XV. } Circles, &c. upon
 118, 119. Construction of a Celestial Globe
 120. Quadrant of Altitude
 121. Construction of a Celestial Globe
 122. Fergufon's Celestial Globe
 123. Planetary Globe
- XV. Fig. 124—138. Gravitation
- XVI. Fig. 138. Heat
 139. Heliocentric Latitude
 140. Hemisphere, Horizon, Tropics
 141. Horizon
 142. Hour
 143—146. Jupiter
 147. Latitude
 148. Reduction
- XVII. Fig. 1. Longitude
 2. Mars
 3, 4. Meridian Line
 5—16. Moon
- XVIII Fig. 1, 2. Nodes
 3. Paracentric
(The reference to fig. 2. under this article, should be to fig. 3. The figure wants a curved line drawn from A to B over q.)
 4—7. Parallax
 8—14. Moon's Parallax
 15. Venus's Parallax
 16. Particula Exfors
 17, 18. Penumbra
(Figures 16, 17, 18, are omitted in this Plate, and form Plate XIX. fig. 1, 2, 3, respectively.)
- XIX. Fig. 1. Particula Exfors
(Referred to as Plate XVIII. fig. 16.)
 2. Penumbra
(Referred to as Plate XVIII. fig. 17.)
 3. Penumbra
(Referred to as Plate XVIII. fig. 18.)
 3*—6. Planet

CASTING.

PLATE

- IV. Fig. 40—42. Canal Bridges
(See Plate VI. to which the reference ought to have been made.)
V. Fig. 36, 37. Locks
38, 39. Gates
VI. Fig. 40—42. Canal Bridges
VII. Fig. 43. Swing Bridge
44—47. Rollers, &c. for Ditto
48—52. Navigators' Tools
Map of the Canals, Navigations, and
Railways of Great Britain
(Given in the ATLAS, Vol. VI. of the Plates)

CANDLE MAKING.

- Fig. 1. Apparatus for Dipping
2. Wick Broach
3. Machine for cutting Cotton
4. Tallow Cistern for Mould Candles
5. Mould Frame
6. Mould
7—12. Candle Sticks

CANNON.

- I. Fig. 1. Whole-length Cannon
2. Calcable
3. Muzzle
4. Mortar
5, 6. Sea Ditto
7. Howitzer
8. Land Mortar
9. Sea Mortar
10. Howitzer
11. Mortar
12. Stone Mortar
II. Fig. 13—16. Cannon Boring
III. Fig. 17—21. Cannon Boring, &c.

CANTEENS.

- I. Fig. 1. Canteen
2, 3. Crofs-cutting Saw
4, 5. Tenanting or Rebating Saws
6. Bung Stave
7. Boring Machine
8. Center Bit
9. Slider
II. Fig. 10. Frame
11. Screw Hoop
12. Trufs Hoop
13. Screw Hoop applied to a Canteen
14. Turning the Chime
15. Turning the Head
16, 17. Shears
18. Punching the Hoops
19. Rounding the Ends of the Hoops

CASTING.

- I. Fig. 1, 2. Open Sand Casting
3. Trowel
4. Ramming Tool
5. Lifting Screw
6. Sand Casting between Flasks

CHEMISTRY.

PLATE

- I. Fig. 7—10. Method of Casting Cog Wheels
11—13. Moulds, &c. for Loam Casting

CASTRAMETATION. See CAMP.

CHEMISTRY.

- I. Fig. 1, 2. Cupalo Furnace
1. Fig. 1—5. Still
II. Fig. 1. Blaft Furnace (For fig. 1. read fig. 6.)
6—9. Iron Smelting Furnace
III. Fig. 10. Alcohol
10*—13. Alembic
14. Aludel
IV. Fig. 15—26. Furnaces for the Reduction of Antimony
V. Fig. 27, 28. Woulfe's Apparatus
VI. Ditto
VII. Fig. 1—4. Distillation
VII. Fig. 1—4. Blaft Furnace
VIII. Fig. 1—4. Ditto
IX. Fig. 1—6. Ditto
(The reference to Plate IX. fig. 4. under this article as "the Ground-plan of arch, pillars, hearth, &c. of a Blaft Furnace," should be to Plate X. fig. 4.)
X. Fig. 1—10. Blaft Furnace
X. Fig. 1—3. Blowpipe (See Plate XIV. fig. 5—7.)
X. Fig. 1. Hope's Eudiometer
(See Plate XXI. fig. 1.)
2. Pepys's Eudiometer
(See Plate XXI. fig. 2.)
XI. Fig. 1—7. Blow-pipe
XI. Ancient Chemical Characters.
XI. XII. Blaft Furnace Works, Plan and Section
XIII. XIV. Blaft Furnace Works
Fig. 1. Section of the Building
2. Dam Stone
3. Dam Plate
4. Tymp Plate
1, 2. Water Regulator
XIV. Blaft Furnace Works
XIV. Gafometer and Blow-pipe
Fig. 1. Hydraulic Bellows
2. Air Holder
3. Bell
4. Gas Holder
5. Glafs Blower's Lamp
6. Shoe Lamp
7. Double Blow-pipe
(Fig. 5, 6, 7, are referred to as Plate X. fig. 1, 2, 3.)
XV. Fig. 1, 2. Air Vault
XVI. Laboratory
Fig. 1. Stand with the Apparatus
2. Retort
3. Acid Holder
4, 5. Receiver
6. Bended Tube
7. Adopter
8. Receiver
10. Nooth's Apparatus
11. Dr. Hamilton's Apparatus

COMPOSITION.

PLATE

- XVI. Fig. 12. Part of Nooth's Ditto enlarged
 16. Pneumatic Trough
 17. Supporter
 18. Eudiometer Tubes
 19. Mercurial Trough
 20. Glafs Jar
 21. Iron Ring Supporter
 22. Volta's Eudiometer
 23. Evaporating Vessel
 24. Mattrafs
 25. Proof Glafs
 26. Precipitating Glafs
 27. Gas Bottle
 28. Muffel
 29, 30. Crucible
 31, 32. Crucible Stands
 33. Cupel
 34. Separatory Funnel
 35. Iron Retort

XVII.

- Fig. 9. Apparatus for the Absorption of Gases
 13, 14. Simplified Gafometer
 15. Pepsy's Gafometer

XVIII. XIX. (No Plates of these Numbers)

- XX. Fig. 1—3. Apparatus for the Distillation of Pyroigneous Acid

XXI.

- Fig. 1. Hope's Eudiometer
(Referred to as Plate X, fig. 1.)
 2. Pepsy's (or Davy's) Improvement of Volta's Eudiometer
(Referred to as Plate X, fig. 2.)
 3. Gay Lussac and Thenard's Apparatus
 4. Berzelius's Apparatus for the Analysis of Organic Substances
 5. Dr. Wollaston's Scale of Chemical Equivalents.

CHIARO-SCURO.

(See COMPOSITION, Plate II.)

CHIMNEY-SWEEPING.

(See MISCELLANY, Plate II.)

CLOUDS.

- I. No. 1. Cirrus in different Forms
 2. Cirro Stratus subiding on Cumuli beneath
 3. Cirrus as seen before Thunder
 4. Cirro Cumulus as seen before Thunder
 5. A Nimbus flanked by Cirro Stratus, and giving an electrical Discharge
 6. A Range of Cumuli passing to Cumulo Strati before Thunder
- II. No. 1, 2. Cirro Stratus
 3. Cirrus passing to Cirro Cumulus
 4. Cirro Stratus, Cumulus, and Cumulo Stratus, grouped

COMPOSITION.

- I. Fig. 1. The "Battle of the Standard," by Lionardo da Vinci

COTTON MANUFACTURE.

PLATE

- I. Fig. 3. The "Creation of Man," the "Transgression at the Tree of Knowledge," and "the Expulsion from Paradise," — Frescoes of Michelangelo in the Sistine Chapel
 4. "Groups of the Last Judgment," by the same Master in the same Chapel
- II. 2. "The Cartoon of Pifa," (or, according to Vafari, its chief Group,) by Michelangelo
 5. "Paul preaching at Athens," from the Cartoon of Raffaele at Hampton Court
 6. "The Group from the Assumption of the Madonna," in the Cupola of the Duomo at Parma, Correggio

CHIARO-SCURO.

1. The simple Principles of Chiaro-Scuro illustrated
 2. The Conduct of Correggio in the Distribution of his Masses of Light and Shade exemplified in one of his Compositions in the Duomo at Parma
 3. An Example from Rubens
 4. Rembrandt

CONICS.

- I. Fig. 1. Ambigenal
 2, 3. A Symptote
 4—10. Cone
(The reference to truncated cons, fig. 8, should be to fig. 9.)
 12. No. 2. *(See fig. 3.)*
 20. Abscisse *(See fig. 2.)*
 31, 32. Axis *(See Geometry, Plate IX, fig. 5, 6.)*
 33. A Symptote *(The figure thus referred to is in Geometry, Plate IX, fig. 4.)*
- II. Fig. 1—9. Conic Sections; lines harmonically divided
 10—14. Conic Surfaces
- III. Fig. 15—23. Sections
 IV. Fig. 24—31. Ditto
 V. Fig. 31, 32. Axis *(See Geometry, Plate IX, fig. 5, 6.)*
 32—43. Conic Sections
- VI. Fig. 44—55. Sections
- VII. VIII. Fig. 1—13. Ellipse
 VIII. IX. Fig. 14—26. Ditto
 X. Fig. 1—12. Hyperbola
 XI. Fig. 13—21. Ditto
 XII. Fig. 1—16. Parabola

COTTON MANUFACTURE.

- I. Fig. 1—6. Calico Printing
 II. Fig. 1—5. Battling Machine
 III. Fig. 1—5. Deviling
 IV. Fig. 1—4. Carding Machine
 V. Fig. 1—4. Drawing Frame
 VI. Fig. 1, 2. Roving Can Frame
 3, 4. Winding Block
(The number has been omitted on this plate.)
- VII. Roving Frame
 Horizontal Plan of the Machine called the Double Speeder

DIALLING.

- PLATE
VIII. Roving Frame, Double Speeder
Fig. 1—3. Elevation in Front
(This, like the preceding, is numbered Plate VII.)
- IX. Fig. 1—6. Water Spinning Frame
- X. Fig. 1—3. Throttle Spinning Frame
- XI. Fig. 1—5. Mule Spinning
- XII. Fig. 1, 2. Reeling
3—5. Machine for winding sewing Cotton into Balls
- XIII. Fig. 1, 2. Doubling Machine
3, 4. Twisting Machine
- XIV. Sections of Messrs. Strutt's Cotton Mills at Belper
Fig. 1. Longitudinal Section
2. Cross Section
3. Section of the Wing

CRYSTALLOGRAPHY.

(See Plates, Vol. V. NATURAL HISTORY)

CUTLERY.

- I. Fig. 1. Two Troughs of a Grinding Mill
2, 2.* Tongs for pressing Knife-Handles
3. Pressing Vice
3. Spring Drill
(This is the only Plate of Cutlery)

CYCLOID.

Fig. 1—8. *(By mistake these figures have been twice engraved. See ANALYSIS, Plate V. fig. 1—8. to which the reference is made in the letter-press)*

DIALLING.

- I. Fig. 1. Declinator
1.* Ruler of the Declinator
2, 3. Declinator
4. Equinoctial Dial
5. Universal Equinoctial Dial
6, 7. Universal Dial
8—12. Horizontal Dial
13. Vertical South Dial
- II. Fig. 14. Vertical North Dial
15. South Dial
16. East Dial
17, 18. Polar Dial
19. Dial on three Planes
20. Dials (primary)
21, 22. Vertical declining Dial
23. Inclined Dial
24. Universal Mechanical Dial
(For fig. 25, 26, see Plate IV.)
- III. Fig. 27, 28. Cylindrical Dial
29, 30. Portable Dial
31—33. Universal Dial on a Cross
- IV. Fig. 25, 26. *(of Plate II.)* Moon Dial
34, 35. Ring Dial
36. Tide Dial *(See MISCELLANY, Plate XXV. fig. 10.)*
36, 37. Dials constructed by a Globe
38—41. Dialling Cylinder
42. Dialling Scales

ELECTRICITY.

PLATE

DOCKS.

Docks at Liverpool, 1808
Docks at London, 1808

DRAWING.

- I. II. III. Fig. 1, 2. Outlines of the Human Face
3. Shading, Hatching
4, 5. Outlines of the Human Face
6. Shading, Hatching
- IV. Isis Magna Mater
- V.—VII. *(No Plates of these Numbers)*
- VIII. From an original Drawing by G. Poussin
- IX. Ditto
- X. Landscape from an original Drawing of Claude Lorraine

DRAWING INSTRUMENTS.

- I. Fig. 1—11. Compasses
(For fig. 5, see Plate TURNING, fig. 29.)
- I. Fig. 1. Peacock's Delineator
2, 3. Miss Edgeworth's Ditto
4, 5. Ramfden's Optigraph, by Jones
6, 7. Wollaston's Camera Lucida
- II. Fig. 1, 2. Oval
3—6. Farey's Elliptograph
7. Douglas's reflecting Protractor

ELECTRICITY.

- I. Priestley's Battery
- I.* Fig. 2. Teyler's Battery
(This Plate is referred to as Plate I. fig. 2.)
3. The Frame separate
(See Plate XV. fig. 7.)
4. The Whole Battery
(As this so nearly resembles the Battery represented in Plate I. it has been deemed unnecessary to give it on a separate Plate.)*
Bell *(See Plate V. fig. 38.)*
- II. Fig. 4—9. Condensers
- III. Fig. 10—20. Dischargers
21—25. Cavallo's doubler
- IV. Fig. 26—37. Electrical Experiments
- V. Fig. 38—50. Ditto
- VI. Electrical Configurations
(This Plate is not numbered)
- VII. & XIV. *(One Plate)* Fig. 51, 52. Electrical Experiments. Electrical Flyers
53, 54. Inflammable Air-Pistol
55. Volta's Inflammable Air-Lamp
- Fig. 1, 2. *(XIV.)* Electrophorus
- VII. Fig. 1, 2. Hawkbee's Electrical Machine
3. Abbe Nollet's Machine
4. Dr. Watfon's Ditto
5. Mr. Wilfon's Ditto
- VIII. Fig. 6—9. Electrical Machines
- IX. Fig. 10. Mr. Beccaria's Machine
11. Common Machine
12. Nairne's Ditto
18. Van Marum's Ditto
(Referred to as on Plate XI.)

FLAGS.

- PLATE
 X. Fig. 13. Nairne's Machine, with a Perfon electrifying his Shoulders
 14. Ditto, his Leg
 15, 16. Pearfon's Machine
 18. (*See Plate IX.*)
 XI. Fig. 22. Cuthbertfon's Electrical Machine
 (*This is numbered Plate X.*)
 XII. & }
 XIII. } Fig. 1—12. Electrometers
 13—15. (*Plate XIII.*) Ditto
 XIII. Fig. 16—23. Electrometers
 XIV. Fig. 1, 2. Electrophorus
 (*On Plate VII. & XIV.*)
 XV. Fig. 1. Medical Electricity. Machine for electrifying the Teeth
 2, 3. Thunder-Houfe
 4, 5. Torpedo
 6. Brush
 7. No. 1, 2. Infide Connecting Frame of Teyler's Battery
 (*Referred to as Plate I. fig. 3.*)

ENGINE.

- I. Fig. 1—7. Salmon's Weighing Machine
 (*This is numbered Plate II.*)
 II. Fig. 1—3. Cutting Engine, by Hindley
 III. Fig. 1—5. Ditto
 6—12. Rofe Engine, by Holtzapfell and Deyerlien
 IV. Cutting Engine, by Rehe
 V. Fig. 1. Ditto, for Worm Wheels
 2. Annular Wheels
 3. Short Arbor
 4. Engine for Racks
 5. Cutter Arbor
 VI. Fig. 1—6. Cutting Engine, by Rehe, for sharpening Cutters
 VII. Ramfden's dividing Engine, Perspective View
 VIII. Fig. 2—4. Ramfden's dividing Engine
 IX. Fig. 5—14. Ditto
 X. Engine for cutting the Screw of Ramfden's Circular dividing Engine
 Fig. 1. Elevation
 2. Plan
 XI. Engine for cutting the Screw of Ramfden's ftraight Line dividing Engine
 Fig. 1. Plan
 2. Elevation
 XII. Fig. 1—3. Ramfden's Engine for dividing ftraight Lines

ENGRAVINGS, EARLY BRITISH.

- Fig. 1. From the front of King Alfred's Jewel
 From the back of King Alfred's Jewel
 2. Impreffion from the engraved Seal of Anfelm, the Primate
 3. Engraved Brafs on the Tomb of William de Fulbourn, in Fulbourn Church, Cambridgefhire

FLAGS.

(*See HERALDRY, Plate VII.*)

FORTIFICATIONS AND TACTICS.

PLATE

FARRIERY—Horfe-Shoeing.

- I. Concave Fore-shoe, or S. Bell's Shoes
 Racing Hind-shoe
 Fore-shoe
 Seated Fore-shoes
 Froft-shoe
 Shoe to prevent cutting
 Hind-shoe
 Fore-shoe with a Joint in the Toe
 (*This is the only Plate of Farriery.*)

FEATHERS.

(*See above, under ANATOMY, COMPARATIVE.*)

FENCES.

- XIX. (*The Plate fo entitled and numbered is AGRICULTURE, Plate XIX.*)

FORTIFICATION AND TACTICS.

- I. II. & IV. Fig. 1. Angle at the Centre
 1. Baftion, &c.
 2, 3. Cavalier
 4, 5. Expence Magazine
 (*These figures have been omitted, as unnecessary in a Work of this nature.*)
 6—14. Field Fortification
 (*See Plate III.*)
 (II.) Fig. 1, 2. Flank of an Army
 (*The writer of this article in the Cyclopaedia died without furnifhing the figures. They are not, however, effential to the understanding of the description.*)
 1, 2. Battery
 (*Fig. 1. on Plate II. is the figure referred to in the article Battery, as fig. 21. No. 2. Fig. 2. is the figure referred to as 23. No. 2.*)
 3. Battery en Barbe, or Barbet
 (*Fig. 3. is the figure referred to as Plate III. fig. 25.*)
 III. Fig. 1—4. Echellon.
 5. Enfilade
 6—14. Field Fortifications
 (*Referred to as on Plate I.*)
 (IV. on Plate I.) Fig. 1—3. Breafwork.
 (*These figures have been omitted, as the nature of Breafwork will be fufficiently underftood by the view of the figures of Battery, on Plate II.*)
 4—10. Fort
 V. Fig. 1—6. Conftruction
 VI. & VII. Fig. 7—14. Ditto
 VIII. Fig. 15. Belidor's Method
 (*This figure is on the Plate marked FORTIFICATION, Plates VI. VII. VIII.*)
 16—19. Crown-work, &c.
 (*The articles in which these figures are referred to, were written by Mr. Glennie, and the descriptions were taken from an unpublished work of his own. He died without furnifhing the figures.*)
 V. Fig. 1, 2. Irregular Fortification
 3. Profile of a Fortification
 4. Fortified Place

GEOGRAPHY.

PLATE

- V.* Fig. 5. Regular Fortification besieged
 6. Glacis
 7. Gallery
 8. Gabion
- VI. Fig. 1. Horn Work
 2. Double Horn Work
 3—6. Line
 7. (*The same as fig. 4.*)
 8. Lunette
- VI. VII. VIII. 9. Mantelet
 10—15. Mine
- (VII.) Fig. 38. Battery (*See Plate II.*)
 2, 3. Parallel of Arms (*See Plate V.* fig. 5.*)
 4. Ravelin
 5. Redoubt
 6—8. Tenaille
 9. Tenaillon
- (VIII.) Fig. 15. Belidor's first Method.
 (*Plates VI. VII. and VIII. are on one Plate.*)

FURNACE.

- I. Fig. 1—3. Air Furnace
- II. Fig. 1. Dr. Black's Air Furnace
 2. Common Air Furnace
 3. Mr. Knight's Ditto
 4. Mufhet's Ditto
 5. Knight's Portable Ditto
 6—11. Dr. Black's Ditto
- III. Fig. 1, 2. Furnaces used by Mr. Mufhet for his Experiments on Iron and Steel
 3—5. Tobacco Pipe Maker's Furnace
- III. & IV. (*This Plate is IRON MANUFACTURE, Plate III. IV., and is placed among the Plates belonging to that article.*)
 Fig. 3, 4, 5, referred to under the article FURNACE, *Aikin's Improvement of Lewis's Furnace, are on that Plate.*)
- V. Fig. 1—9. Furnace for enamelling Watch Dial Plates
 10, 11. Mr. Bone's Enamelling Furnace

GARDENING.

- I. Bark-Beds and Pits for succession of Pine-apple Plants; and other tender Exotics
 Fig. 1, 2. Plan
 3. Bark-Beds
 4. Plan and Section of Bark-Bed and Bark-Shed
 5. Section of Fig. 1, 2.
 (*This Plate is marked BARK-BEDS and PITS.*)
- II. Fig. 1—4. Green-Houfe
 5, 6. Conservatory
- III. Fig. 1, 2. Improved Hothoufe
 3. Loudon's Hothoufe for Pines
 4, 5. Nursery Houfe for Ditto

GEOGRAPHY.

- I. Fig. 1. Distance
 2, 3. Horizon
 4—8. Map

GEOMETRY.

PLATE

- II. Fig. 9. Meridian
 Pole (*See NAVIGATION, Plate I. fig. 1.*)
 10—14. Tide
 (*See NAVIGATION fig. 4—8.*)
- GEOLOGY.
- I.—IV. (*The Plates of GEOLOGY are with the NATURAL HISTORY Plates in the fifth Volume.*)
- II. Gun-Flints
 (*See MISCELLANY, Plate II.*)

GEOMETRY.

- Acute Angle
 (*Referred to as GEOMETRY, fig. 1. see GEOMETRY, Plate II. fig. 15, D A E.*)
- I. Fig. 1. Alternate Angles
 2—13. Altitude, Method of measuring
 14. Altitude and Distance, Method of measuring
 14. Analysis
 (*See GEOMETRY, Plate IX, fig. 1.*)
- II. Fig. 15—26. Angle
 27, 28. Antiparallel
 29—34. Application
 35, &c. Bevel
 (*See the following Plate.*)
- III. Fig. 12. Sector
 (*See Plate XIII, fig. 12.*)
 35—39. Bevel, &c.
 (*Referred to as Plate II, fig. 35, &c.*)
 Fig. 38, Bafe, should be referred to fig. 46*, on the same Plate.)
 39. Bafe of a Cylinder
 (*See GEOGRAPHY, Plate IX, fig. 7.*)
 40—44.* Bevel
 45—48. Chord
 45.* Arch
 46.* Bafe
 48.* Cardioide
 49.* Catenaria
 50. Complement of a Parallelogram
 (*See GEOMETRY, Plate IX, fig. 8.*)
 51. Angle of Contact
 (*See GEOMETRY, Plate IX, fig. 9.*)
 52. Cube
 (*See GEOMETRY, Plate IX, fig. 10.*)
- IV. (*Referred to as Plate III.*)
 Fig. 1. Cyclograph
 (*See GEOMETRY, Plate IX, fig. 11.*)
 Fig. 49—61. Circle
 78. Diameter
 (*See Plate VI, fig. 78.*)
 3, 4. Cylinder
 (*These figures are inserted on ANALYSIS, Plate II.*)
- V. Fig. 62—73. Circle
 VI. Fig. 74. Decagon
 75—77. Diagonal
 78. Diameter
 (*Referred to as on Plate IV.*)
 79. Diameter, No. 1, 2, 3.
 80. Dirigent
 81. Divisibility
 82. Division

GEOMETRY.

- PLATE
VI. Fig. 83. Decagon
(For Dodecagon, see Hexagon, Plate VIII. fig. 97.)
84. Diophantine
85, 86. Distance
VII. Fig. 87. Extreme and Mean Proportion
88—95. Frustum
VIII. Fig. 96. Gnomon
97. Hexagon
98, 99. Honeycomb
100. Hypothenuse
101. Inclination of Planes
102. Indivisibles
103, 104. Internal Angle
105. Ifoceles Triangle
IX. Iperimetry, Fig. 1—17.
(See ANALYSIS, Plate IX. fig. 1—17.)
IX. Fig. 1. Analysis
(Referred to as GEOMETRY, Plate I. fig. 14.)
2. Construction
(Referred to as ANALYSIS, fig. 20.)
3. Hyperbolic Logarithms
(Referred to under Function, as ANALYSIS, Plate VII. fig. 5.)
4. Asymptote
(Referred to as CONICS, fig. 33.)
5, 6. Axis of the Elliptic and Hyperbola
(Referred to as CONICS, fig. 31, 32.)
7. Cylinder, Base of
(Referred to as GEOMETRY, Plate III. fig. 39.)
8. Complement of a Parallelogram
(Referred to as GEOMETRY, Plate III. fig. 50.)
9. Angle of Contact
(Referred to as GEOMETRY, Plate III. fig. 51.)
10. Cube
(Referred to as GEOMETRY, Plate III. fig. 52.)
11. No. 1. and 2. Cyclograph
(Referred to as GEOMETRY, Plate IV. fig. 1.)
12, 13. Pyramid
(Referred to as GEOMETRY, Plate XI. fig. 18, 19.)
14—19. Tangent
(Referred to as ANALYSIS, Plate XV. fig. 1—6.)
X. Fig. 1. Line
2—5. Lunes
6, 7. Multiplication
8, 9. Octagon
10. Parallel
11, 12. Parallel Rulers
(The reference under the article RHOMBUS, to Plate X. fig. 11, should be to Plate XII. fig. 11.)
13. Parallelepiped
14, 15. Parallelogram
XI. Fig. 16. Pelecoides
17, 18. Pentagon
4, 5. Perpendicular
6. Polygon
7—11. Polygonometry
12, 13. Porism
(For fig. 12, Prism, see fig. 15.)
14. Geometry of Position
15. Prism
(Referred to as fig. 12.)
16, 17. Proportional
18, 19. Pyramid
(See GEOMETRY, Plate IX. fig. 12, 13.)

GEOMETRY.

- PLATE
XII. Fig. 1. Quality
(The reference under the article RHOMBOIDES, to fig. 1, should be to fig. 10.)
2. Reciprocal Figures
3, 4. Rectangle
5—8. Reduction
9. Regular Body
10. Rhomboides
(Referred to as fig. 1. See above.)
11. Rhombus
(Referred to as GEOMETRY, Plate X. fig. 11.)
12. Ring
13. Similar Curves
(Referred to as GEOMETRY, Plate XIII. fig. 14.)
Tetrahedron
Cube
Octahedron
Dodecahedron
Icosahedron
XIII. Fig. 1—3. Scale
4. Secant
5—12. Sector
(Fig. 12. is referred to as GEOMETRY, Plate III. fig. 12.)
13. Segment
14. Similar Curves
(See Plate XII. fig. 13.)
17, 18. Staff
(See Plate XIV. fig. 12, 13.)
XIV. Fig. 1. Solid Angle
2. Solidity
(The reference under SPHERE, should be to fig. 3.)
3. Sphere
(The reference to fig. 3, under SPHEROID, should be to fig. 4.)
4. Spheroid
5—9. Spiral
(The reference to fig. 4—8, under SPIRAL, should be to fig. 5—9, respectively.)
10, 11. Square
(For Stereographic Projection, see below, fig. 14—16.)
12, 13. Staff
(Referred to as GEOMETRY, Plate XIII. fig. 17, 18.)
14—16. Stereographic Projection
(Referred to as fig. 10—12.)
XV. Fig. 1. Sub-contraary
2. Subnormal
3. Tangent
4. Tetrahedron
5. Triangle, Equilateral
6. Scalene
7. Rectangular
8. Obtusangular
9. Triangles, Similar
10. Menuration of
11, 12. Properties of
13. Ifoceles
14—17. Triangles
18. Vertex
19. Ungula
20, 21. Goldman's Volute

HOROLOGY.

PLATE

GLAZING CLOTH.

(See MISCELLANY, Plate II.)

GUNNERY.

- Fig. 1. Gun Pointing
 2. Nock's improved Breech
 3. Gunnery. Theorem for determining the Velocity of a Ball
 4. Petard
 5. Quadrant
 6. Bomb
 7. Caliber Compafs

HAIR.

(See above, ANATOMY, COMPARATIVE)

HERALDRY.

- I. Partition Lines
 Escutcheons
 Roundles
 Metals and Colours
 Furs
 Abatements
 II.—VI. Abatements
 VII. Flags and Standards, Military and Naval
 VIII. Orders of Knighthood, Stars, Collars, Badges, &c.
 IX. Ditto
 X. Crowns, Coronets, Mitres
 X. B. Ditto
 XI. Achievements borne at the Interment of the Earl of Chatham, in Westminster Abbey
 XII. Funeral Achievements, Escutcheons, Hatchments
 XIII. Heraldic Crowns, Coronets, and Helms
 XIV. Royal Distinctions
 Distinctions of Houses
 Bar
 (See Plate III.)
 Barry, &c.
 (See Plate III.)
 Hatchments
 (See Plate XII.)

HORNS.

(See above, ANATOMY, COMPARATIVE)

HOROLOGY.

- I. Fig. 1—3. Antient Clepsydræ
 II. Fig. 1—6. Modern Clepsydræ
 III. Fig. 1—5. Clock Movement
 IV. Fig. 1—7. Clock Movement
 V. Fig. 1—4. Chime Work in the Clock Room of St. Margaret's, Westminster
 VI. Ditto
 VII. Fig. 1—4. Chimes, Pleyel's German Hymn
 VIII. Fig. 1—5. Ancient Clock, by Henry De Wick, 1370

HOROLOGY.

PLATE

- IX. Fig. 1—3. Thirty-hour Clock, with Alarm, and Count Wheel Striking Work
 X. Fig. 1—3. Callipering
 XI. Fig. 1—3. Portable Eight-day Clock
 XII. Fig. 1—4. Dial Work, and Striking Part of an Eight-day Clock
 XIII. Fig. 1—7. Mudge's Time Keeper
 XIV. Fig. 1—7. Arnold's and Earnshaw's Chronometers
 XV. Fig. 1—8. Brockbank's Chronometer
 XVI. Clock with Chimes
 XVII. Ditto
 XVIII. Fig. 1. Clock, by Dr. Franklin
 2. Mr. Ferguson
 3—5. Second, by Ditto
 XIX. Fig. 1—20. Clock Tools
 Compensation Balance
 (See Plate XXIX.)
 XX. Fig. 1—18. Clock Tools
 XXI. Fig. 1—17. Ditto
 XXII. Fig. 1—6. Astronomical Clock; by Reid
 XXIII. Fig. 1—4. Astronomical Clock, by Brockbanks
 XXIV. Fig. 1, 2. Equation Clock, by Enderlin
 XXV. Clock Work
 Fig. 1. Striking-part, with one Wheel and one Pinion
 2. Strike, or Silent
 3. Endless Cord of Huygens
 4. Forcing Spring
 5. French Forcing Spring
 6. Bolt and Shutter
 XXVI. Clock
 Fig. 1. Mafley's Striking-part
 2, 3. Prior's Striking-part
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11. Forster's Oat Beard Hygrometer
12. Kater's Hygrometer
- XIV. Fig. 1. Jet d'Eau
2. Moisture
3. Persian Wheel
4. Pump, Common Sucking
5. Forcing
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7. Ctefebe's
8. Chain
9. Parts of Ditto
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- XIV. XV. Fig. 9, 10. Rope Machine
11—13. Archimedes' Screw
14, 15. Water Screw
- (XV.) Fig. 1—5. Siphon
6. Papin's, or Wirttemberg
7. Springs
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- XV. Pumps
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- I. Fig. 1—17. Capillary Tubes, &c.

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(See above, ANATOMY, COMPARATIVE.)

LAMPS.

PLATE

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- I. Iron Forge
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2. Elevation
- II. Fig. 1. Section of the Finery. Front View
2. Another Section. Side View
3. Enlarged View of the Tuyere Iron
4. Tuyere Iron with the Cistern
5. Tongs for taking the Balls from the Furnace
6. Iron Fork
7. Iron Ladle
8. Face of the Stamping Iron
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10. Balling Furnace. Section
11. Elevation
- III. IV. (Lettered FURNACE, Plate III. IV.)
Fig. 1. Reverberatory Furnace for melting large Quantities of Metal. Section
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- IV. Smeaton's Forge Hammer Machinery for Kilmhurif Forge
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- V. Rollers for making Bar Iron
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2. Side Elevation. Ditto
3. Plan. Rollers for flat Bars
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5. Plate Rollers. End Elevation
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- VI. Rolling and Slitting Mill at Messrs. Walkers' Iron Works, Rotherham
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2, 3. Elevations
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- VII. Steel Converting Furnace
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- VIII. Mill for tilting Steel, by Smeaton
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LAMPS.

- I. Fig. 1—3. Argand's
4. Lamp Cotton
5, 6. Kier's Lamp
7. Rolling Lamp
- II. Fig. 1—4. King's Hydro-Pneumatic Lamp

PLATE

- II. Fig 5, 6. Barton's Lamp
7, 8. Porter's Automaton Lamp

LATHE.

- Fig. 1—10. Mr. H. Maudflay's Lathe

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- Fig. 1—19. Luminous Animals
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LIGHT-HOUSE.

- Fig. 1—8. Light-House on the Eddystone Rock

MAGNETISM.

- I. Fig. 1—12. Compafs
II. Fig. 13—16. Ditto
III. Fig. 17—22. Variation Compafs
IV. Fig. 22—29. Dipping
(For fig. 27. See Plate V.)
30. Dipping Needle, by Lorimer
(Referred to as fig. 3.)
V. Dipping Needle, by Nairne, on Mr. Mitchel's Plan
VI. VII. Fig. 1—12. Magnet
(VII.) Fig. 1. Ditto
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VII. Fig. 2—16. Magnet

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- I. Fig. 1. Reticulated
2. Incertain
3. Hodomum
4. Pseudifodomum
5. Roman Empletion
6. Greek Empletion
II. Fig. 1. No. 1. Plano Cyliindroidic Arch
No. 2. Plano Cylindric Arch
2. No. 1. Cylindro-Cylindric Arch
No. 2. Cylindro-Cyliindroidic

MAST, PLATE OF.

(See SHIPS, Plate VIII.)

MECHANICS.

1. Fig. 1, 2. Acceleration
3. Angular Motion
(See Plate II. fig. 1.)
3, 4. Angle of Elevation
5—7. Axis in Peritrochio

PLATE

- II. Fig. 8—11. Balance
12. Bent Lever Balance
13. Affay Balance
14. Ballast
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II. Fig. 1. Angular Motion
2—4. Boring Water Pipes
(Referred to as fig. 67—69.)
5. Crab for launching Ships
(Referred to as Plate XVIII. fig. 1.)
6, 7. Double Cylindrer
(Referred to as Plate XXII. fig. 1, 2.)
8, 9. Jack for raising Timber
(Referred to as Plate XXX. fig. 1, 2.)
10. Smoke Jack
(Referred to as Plate XXX. fig. 3.)
11—13. Lever
(Referred to as Plate XXX. fig. 4—6.)
14—17. Projectiles
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III. Fig. 15. Capstan, Common Moveable
16. Double
17. used at the London Docks
18. Main, or double
19. Jeer, or little
20. Mr. Plunket's
21. Cast-iron Lifter for
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VI. Fig. 41—51. Ditto
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55. Center of Motion
56—60. Center of Oscillation
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XII. Fig. 1—9. Chains
10, 11. Clay Mill
XIII. Fig. 1. Fore Wheels of a Crane-necked Carriage
2. Jacob's Contrivance for the Fore-wheels of a Carriage
XIV. Fig. 1, 2. Coal Measuring
XIV.* Fig. 1—15. Water Cocks
XV. Fig. 1, 2. Composition of Motion
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XV. Fig. 1—24. Collision
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XV. Fig. 1—7. Comb-making
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MECHANICS.

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 7. Double Cone
 10, 11. Prony's Condenser of Forces
- XVII.** Fig. 1—4. Cork Screws
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- XVIII.** Fig. 1. Crab
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 2, 3. Cranes, by Ferguson
- XIX.** Fig. 1—3. Mr. Smeaton's Design for a Crane, for the Wool Quay, Custom House, London
- XX.** Cranes
 Fig. 1, 2. White's Crane
 3, 4. Braithwaite's
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- XXI.** Fig. 1—5. Cranes, various
- XXII.** Fig. 1, 2. Cylinder, Rolling
(See DOUBLE CYLINDER, Plate II. fig. 6, 7.)
- XXII. & XXIII.** } Fig. 3. Direction of Motion
 4—6. Line of Direction
- (XXIII.)** Fig. 1—4. Hill's Machine for drawing Ships' Bolts
- XXIII.** Fig. 1—7. Mr. Dixon's Machine for Boring Cylinders, at the Falcon Iron Foundry
(For MILL referred to Plate XXIII. see Plate XXXIII.)
- XXIV.** Fig. 1—9. Drills
 10, 11. Drilling Machine
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- XXV.** Fig. 1—7. Dynamics
- XXVI.** Dynanometers for measuring the Force of Draught
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 2. Salmon's
 3. Contrivance for determining the Force required to work a Mill
- XXVI.** Expanding Riggers
 Fig. 5—7. Mr. Flint's
 8—12. Mr. Farey's
- XXVII.** Fig. 1—9. Fly Prefs
- XXVII.** Fig. 1—4. Mr. Salmon's Portable Threshing Mill
- XXVIII.** Fig. 1—20. Force
- XXIX.** Friction and Fulling Mill
 Fig. 1—3. Friction
 4—6. Fulling Mill
- XXX.** Fig. 1, 2. Jack for raising Timber
(See Plate II. fig. 8, 9.)
 3. Smoke Jack
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 4—6. Lever
(See Plate II. fig. 11—13.)
- XXX. & XXXVI.** } Fig. 1—5. Wedge
 6, 7. Weight
 8—13. Wheel
(Fig. 1—13. are referred to respectively as on Plate XL.)
- (XXXVI.)** Fig. 11—13. Pulley
 14. Refraction
 15. Solid of the least Resistance
 16, 17. Mechanical Powers
(Referred to as Plate XXXII. fig. 18, 19.)

MILITARY MANŒUVRES.

- PLATE
XXXI. Fig. 1—5. Logwood Mill
- XXXII.** Fig. 1—17. Mechanical Powers
(See for fig. 18, 19. Plate XXX. and XXXVI. fig. 16, 17.)
- Fig. 1, 2. Common Breast Mill
 3. Dr. Barker's Mill
 4. Portable or Hand Mill
- XXXIV.** Fig. 1—8. Flour Mill designed by Smeaton
- XXXIV.** Fig. 1—10. Motion
 11. Perpetual Motion
 12—15. Percussion
 16—21. Inclined Plane
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- XXXV.** Fig. 1—6. Colour Mill
- XXXV.** Fig. 1—9. Pile-driving Machine
 10—12. Bramah's Machine for drawing Piles out of the Ground
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- XXXVI.** Fig. 7—10. Projectiles
(See Plate II. fig. 14—17.)
 11—13. Pulley
 14. Refraction
 15. Resistance, Solid of the least
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- XXXVII.** Fig. 1—10. Rotation
- XXXVIII.** Screws
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 4. Endless Screw
 5. Machine to shew the Power of the Screw
 6—10. Spring
 11. Steelyard *(Referred to as fig. 6.)*
- XXXIX.** Fig. 1—13. Strength of Materials
- XL.** Fig. 1—6. Machines for casting and drawing Lead Pipes
- XL.** Fig. 1—5. Wedge
 6, 7. Weight
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(These three subjects are given on the Plate which is numbered XXX. & XXXVI. The figures correspond with the reference to Plate XL.)
- MICROSCOPIC OBJECTS.
(See Plates, Vol. V. NATURAL HISTORY, ANIMALCULES.)
- MIDWIFERY.
(The Plates intended for the illustration of this article have been, for obvious reasons, purposely withheld.)
- MILITARY MANŒUVRES.
- I. First Manœuvre
 Second Ditto
 Third Ditto
 Fourth Ditto
- II. Fifth Manœuvre
 Sixth Ditto
 Seventh Ditto
 Eighth Ditto
 Ninth Ditto

MISCELLANY.

- PLATE
 III. Tenth Manœuvre
 Eleventh Ditto
 Twelfth Ditto
 Thirteenth Ditto
 IV. Fourteenth Manœuvre
 Fifteenth Ditto
 Sixteenth Ditto
 V. Seventeenth Ditto
 Eighteenth Ditto
 Nineteenth Ditto
 VI. Inspection, or Review

MILL WORK.

- I. Fig. 1—8.
 II. Fig. 9—17.
 III. Fig. 18, 19. No. 1, 2. Fig. 20—27.

MINERALOGY.

- I. Fig. 1—10. Mining—Bafalt
 II. (See *Plates*, Vol. V. NATURAL HISTORY)

MISCELLANY.

- I. Fig. 1, 2. Altitude. Sea Gage
 3. Altar of Incense
 4. Burnt Offering
 Altars, Pagan (See *BASSO RELIEVO*, Plate IV.)
 5. Ark of the Covenant
 6. Neper's Bones
 7. Ancient Arithmetical Characters
 Chinese Musical Instruments
 8. Ching
 9. King
 II. Button Making
 Glazing Cloth
 Tools for cutting Flints, fig. 1—7.
 (Referred to as *GEOLOGY*, Plate II.)
 Smart's Chimney Cleaning Machine,
 Fig. 1—6
 Crystallography, Fig. 21—23.
 III. Fig. 1—4. Coinage
 Copying
 1, 2. Rolling Prefs
 3. Screw Prefs
 III.* Fig. 1, 2. Hawkins's Patent Polygraph.
 IV. Designs for Weaving
 Fig. 7. Similar Spots
 8. Diffimilar Ditto
 9. Dornock
 10. Dimity
 11. Damask
 (These figures are referred to as fig. 1—5.)
 V. Fig. 1—8. Diagonal Motion
 (These figures are erroneously referred to as fig. 12—17. The reader will easily adjust the references in the letter-prefs to the figures on the Plate)
 VI. Fig. 18—20. Diagonal Motion, Dividing and Cutting Engine
 VII. Fig. 1—6. Diagonal Motion
 (The figures on this Plate are referred to as fig. 21—26.)

MISCELLANY.

- PLATE
 VIII. Fig. 1, 2. Diaper Loom
 3, 4. Discharging Prefs
 3. Draw Loom
 8. Diaper
 (For this figure see Plate XII. fig. 8.)
 Dornock
 (See Plate XII. fig. 6.)
 IX. & X. Fig. 1—4. Dramatic Machinery
 (X.) Fig. 1. Ditto
 X & XI. Fig. 2. Ditto
 (XI.) Fig. 1—6. No. 1, 2. Ditto
 7, 8. No. 1, 2. Ditto
 Draught and Cording of Looms
 XII. Fig. 1. Five-leaf Tweel
 2. Broken Tweel
 3. Eight-leaf Tweel
 4. Broken Tweel
 5. Striped Dimity
 6. Dornock
 7. Fancy Dimity
 8. Diaper
 9. Similar Spot
 10. Diffimilar Spot
 XII. Fig. 1—8. Mr. Marfhal's Secret Escutcheon for a Key-hole
 (These figures are referred to as fig. 2—9.)
 9. Self-acting Extinguishers
 10. Hawkins's Ditto
 XII. Fig. 1, 2. Drapery
 (See Plate XX. fig. 8, 9.)
 1. Painter's Easel
 12. Mr. Mafere's Fire Escape, simplified by Forster
 13. Mr. Mafere's Original Suspension
 1—3. Indigo Mills
 XIII. Fig. 1—7. File Cutting, Tools for
 8—10. Filters
 11. Filtration
 (See Plate XXV. fig. 3.)
 XIV. Fire Place, by Dr. Franklin
 Fig. 2. No. 1. Bottom Plate
 2. Back Plate
 3. Side Plate
 3. Ledges
 4. Air Box
 5. Front Plate
 6. No. 6. Top Plate
 7. Shutter
 8. Register
 7. Fire Place and Chimney
 XIV. Fig. 1—6. Hawkins's Claviole, or Finger-key-ed Viol
 Flood Gates
 XV. Fig. 2. Smeaton's Flood Gate, Elevation
 5, 6. Ditto, Plan
 7. Farey's Self-acting Flood Gate
 8—11. Bramah's Hydraultic Sluice
 XV. Fig. 1—5. Apparatus for reifting those Drowning to Life
 Fig. 1. Foundry of Bells
 2, 3. Letters or Types
 4. Fountain Pen
 XVI. Fig. 1. Hooke's Sea Gage, or Bucket
 2. Hale's Aqueo-Mercurial Gage
 3. Marquetry
 (See another View in MISCELLANY, Plate XXIII. fig. 3.)

MONOGRAMS.

- PLATE
 XVI. Fig. 4. Ellicott's Pyrometer
 (*This is referred to as in MISCELLANY, XXIII. fig. 4.*)
 5, 6. Smeaton's Pyrometer
 (*Referred to as MISCELLANY, XXIII. fig. 5, 6.*)
 7, 8. Ferguson's Pyrometer
 (*Referred to as MISCELLANY, XXIII. fig. 7, 8.*)
 9. De Luc's Pyrometer
 (*Referred to as MISCELLANY, XXIII. fig. 9.*)
 10. Rain Gage
 (*Referred to as MISCELLANY, XXIV. fig. 2.*)
 11. Rain Gage of the Royal Society
 (*Referred to as MISCELLANY, XXIV. fig. 3.*)
- XVII. Gas Lights
 Fig. 1—3. Mr. Clegg's Apparatus
 4. Dr. Stancliffe's Ditto
 5. Mr. B. Cooke's Ditto
- XVIII. Fig. 1—18. Gem Engraving
- XIX. Fig. 1. Glanders
 2, 3. Dr. Wollaston's Goniometer
- XX. Fig. 1. Thorley's Bee-Hive
 2—4. White's Ditto
 5. Icehouse
 6. Supple's Mortar Mill
 7. Horle
 8, 9. Drapery
 (*Referred to as MISCELLANY, Plate XII. fig. 1, 2.*)
- XXI. Fig. 1—4. Bramah's Patent Lock
 5—8. Rowntree's Ditto
- XXII. (*For Bramah's Lock, see the preceding Plate. No Plate numbered XXII.*)
- XXIII. Fig. 1, 2. Marble Mill
 3. Marquetry
 (*See another View of this Machine, MISCELLANY, XVI. fig. 3.*)
- XXIII. & XXIV. } Fig. 5, 6. Pentagraph
 (XXIII.) } 7, 8. Perch of a Coach
 9. Parabolic Frustum
 10, 11. Conoid
 12. Pediment
 (*See Plate BASILIC, ARCHITECTURE, Plate XI. & XII.*)
- (XXIV.) Fig. 1—5. Perspective Machines
 6. Pot-ash
 7. Potassium
 8. Water Spout
- XXV. (*Referred to as Plate XXIV.*)
 Fig. 1. Æolus's Harp
 2. Crowth
 Fig. 3. Filtration
 (*Referred to as MISCELLANY, Plate XIII. fig. 11.*)
 4. Marine Trumpet
 4. Supple's Mortar Mill
 (*See MISCELLANY, Plate XX. fig. 6.*)
 5, 6. Hearing Trumpet
 7, 8. Speaking Trumpet
 9. Voice
 10. Tide Dial
 (*Referred to as DIALLING, Plate IV. fig. 36.*)

MONOGRAMS OF FRENCH ENGRAVERS.

Wendel Reich

MONOGRAMS.

PLATE

Jean Duvet or Davet
 Noel Garnier
 Michael Lafne
 Leonard Gualtier
 Pierre Woerriot
 Solomon Bernard
 Rene Bolvin
 Jacques Perfin, or Perfinus
 Francis Perrier
 Pierre Brebiette
 Jerome David
 Pierre Daret
 Stephan du Perac
 Antoine Garner
 François Cheveau
 Jean Couvay
 Dominique Bariere
 Sebastien Vouillemont
 Pierre Lombart
 Jacques Stella
 Nicolas de Larminin

MONOGRAMS OF GERMAN ENGRAVERS.

- I.
 Martin Schoen
 Bartholomew Schoen
 Sandrart
 Hans Schauffien Senior
 Junior
- Martin Zagel
 Albert Glockenton
 Albert Altdorfer
 Albert Durer
 Hans Holbein
 Sigimond Holbein
 Lucas Cranach
 Lucas Kruger
 Hans Sebald Beham
 Burgkmair, Balding and Brefang
 Bartholomew Beham
 Gregory Penz
 Henry Aldegrevener
 Hans Brofamer
 Auguftin Hirshfogel
- II.
 Jacob Binck
 Henry Lautenfack
 Hans Sebald Lautenfack
 Theodore de Brie
 Christopher Stimmer
 David or Daniel Hopfer
 Jerome Hopfer
 Tobias Stimmer
 Melchior Lorich
 Virgil Solis
 Christopher Maurer
 Christopher Jamnitzer
 Joft or Jodocus Amman
 Matthew Greuter
 J. F. Greuter
 Domenic Cuflos
 Theodore Cruger
 Matthias Cruger
 Wolfgang Kilian
 Lucas Kilian
 Bartholomew Kilian
 Matthew Merian
 Christopher Jegher
 Wencellaus Hollar
- III.

MONOGRAMS.

PLATE
III.

John William Baur
Geraud Laireffe
John Ulric Kraus
Andrea Meyer
J. J. Thourneyfon
Derick Meyer
Rodolph Meyer
Adrian Van Oltade

MONOGRAMS OF THE ENGRAVERS OF THE LOW-
COUNTRIES.

I.

John Collaert
Jerome Bos or Bosche
Jacob Bofius
Henry Goltzius
Peter Coeck
Walter Van Affen
Lucas Jacobs
Adrian Collaert
Cornelius Metensis
Cornelius Bos
Martin Hemskerck
Peter Breughel
Crispin de Passe
Dietrich Van Staren
Henry Van Cleef
William de Passe
Dirk Volkart Coornhaert
Francis Babylone
Crispin Vanden Broeck
Jerome Cock
Martin Van Cleeve
Magdalen de Passe

II.

Simon Passe
Christophor Van Sichem
Hanser John Bol
Cornelius Van Sichem
John Sadeler
Philip Galle
Cornelius Cort
Nicholas de Bruyn
Affuerus Londerfel
Jerome Wierix
Abraham de Bruyn
Zachary Dolendo
Paul Moreelle
Karl Van Sichem
James Matham
James de Ghein the elder
John or Hans Saenredam
Bartholomew Dolendo
William Saenredam
Henry Hondius
Abraham Bloemart
Joft Hondius

III.

Lucas Vorsterman
William Hondius
David Teniers
Cornelius Blecker
Michael Natalis
Sheltius à Bollfwert
Efais Vandevelde
Albert Flamen
Adam à Bollfwert
Peter Molyn

MONOGRAMS.

PLATE
III.

Christian Louis Moyart
Nicholas Berghem
Peter Nolpe
Nicholas Viffcher
Peter Quaft
John George Van Vliet
Antonio Waterloo
Henry Vander Borcht
Peter Vander Borcht
Theodore Van Keffel
Abraham Genoels
Herman Van Swanevelt
John de Bifchop or Epifcopius
Lewin Cruyl
Bartholomew Breemberg
John Van Somer
James Vanden Hayden
Robert Van Audenaerde
A. F. Bargas
John Van Hugtenbourg
Peter Van Bleeck
William Buteniveg
John Vanden Bruggen
William de Leeuw
John Von Londerfeil
Herman Muller
Peter Serwouters

IV.

MONOGRAMS OF ITALIAN ENGRAVERS.

I.

J. Ant. de Bresse
Andrea Mantegna
Nicolas da Modena
Agoltino of Venice
Dominico Beccafumi
Jerome Mochetto
Leo Daris or Lion Davin
Marc Antonio
Marc of Ravenna
Julio Bonafone
Dominic Barbieri
Nicholas Beatrice of Lorraine
Lucas Penni
Jean Baptifti Ghifi
George Ghifi of Mantua
Adam Ghifi

II.

Boldrini
Martin Rota
Antonio Fantuzzi
J. J. Caraglio
Antonio Salamanca
Gaspar ab Avibus
J. Baptifta Cavaleris
Mario Kartaro
Jaques Palma
J. Baptifti Pagi
Franceschini
Cherubino Alberti
Andrea Andreani
Jean Louis Valefio
Annibal Caracci
Antonio Tempefta
Odoard Fialetti
Louis Civoli
Francifco Villamena
Guido Reni

MUSIC.

PLATE
III.

Alexander Baldili
Joseph Ribera (l'Espagnolet)
Raphael Sciaminofi
Lucas Ciamberlanus
Horace Borgiani
Alexander Algardi
Pietro Tetta
Gioffe Marie Metelli
Salvator Rofa
Antonio Francisco Lucini
Remigio Cantagalina
Stefano Della Bella
Jaques Callot
Julio Cefario Venenti
Benedetto Cattighione
Giacomo Ballitta Galeftrucci
Antonio Maria Zanetti
Dominico Maria Bonavera
Antonio Bateltra

MUSIC.

- I. Modern Time Table
Characters for Time
- II. Graces and Marks of Expression
- I. Arpeggio
Ancient Musical Characters of the 14th and 15th Centuries
Arrangement of the Set of Keys on Keyed Instruments
Thorough Base, or Accompaniment
- III. Thorough Base
- IV. Thorough Base
Difficulties in Thorough Base
Thorough Base
Counterpoint
- VI.—VIII.
IX.—XI. Fugues
Fundamental Bases
Regle de l'Octave, in four parts
- XIV.—XVI. Counterpoint, preparation and resolution of Discords
- XVII. Double Counterpoint in the Octave
- XXIII.—XX. Contrappunto doppio in genere Cromatico
- XXI. XXII. Modulation
- XXIII. Modulation
Rouffeau's regular Modulation in the Key of C major
Kirnberger's two essential Chords
Examples of the first Use of Discords
- XXIV. Modulation
- XXV. & XXVI. Example of the pathetic Genus, in which are expressed its Successions in the Chromatic Scale ascending and descending
Acciacature (One Plate, numbered XXV.)
- XXVII. Fingering on Keyed Instruments
- XXVIII. Iteration in Fingering
- XXIX. Fingering of Semitonic or Chromatic Divisions
Shakes
- XXX. & }
XXXI. & }
XXXII. } Baffoon
Scale of the Baffoon
(One Plate, numbered XXXII.)
- XXXIII. Air upon Three Notes, by the late M. Rouffeau

MUSICAL INSTRUMENTS.

PLATE

XXXIV.—XLIV. (It was originally intended that these Plates should comprise selections from the works of Haydn and Mozart, and specimens of the national airs of several countries, viz. Italian, English, Scottish, Irish, Welsh, &c.; but as most or all of these subjects are easily accessible, it has been deemed unnecessary to insert them here at so heavy an additional expense)

XLV. Original Melodies to the Hymn of Offian in Temora

XLVI. (No Plate of this number)

XLVII. Euclidis Sectio Canonis

XLVIII. Canon in Ogni Modo
Canone Cancherizando
Complete Set of Keys on the Piano Forte

MUSICAL INSTRUMENTS.

- I. Ancient Musical Instruments
- Fig. 1. Timbrel or Tambour de Basque
2. Citharistria, or female Minstrel
3. Double Lituus
4. Pan playing on the Syrinx
5. A Bacchanal playing on two Flutes of the same Pitch, *tibia pares*
6, 7. Antique Theatrical Masks
8. A genuine ancient metalline Lituus
- II. Ancient Musical Instruments and Masks
- Fig. 1. A Greek Barbiton or Harp
2. Mask of the Hercules furens of Euripides
3. Mask of Thais from Terence's Eunuch
4. A Figure from the Herculeana Paintings
5, 6. Lyres from Sir W. Hamilton's Vases
- III. Ancient Musical Instruments
- Fig. 1—3. Group of Musicians performing an Epithalamium, from a Piece of Ancient Sculpture in the Ghigi Palace at Rome
4. The *Tuba*, or Trumpet of the Jubilee
5. Cupid playing on a double Flute, or *tibia pares*
6—10. From Egyptian paintings in the Tombs of the kings of Thebes
- IV. Ancient Musical Instruments
- Fig. 1, 2. The Testudo, or Lyre of Amphion, front and profile
3. Lyre of Terpichore, in the Picture of that Muse, dug out of Herculeaneum
4. Psaltery from the Picture of Erato, dug out of Herculeaneum
5. Trigonum, or Triangular Harp
6. Abylinian Testudo
7. Etruscan Lyre with seven Strings
8. Lyre in an ancient Picture dug out of Herculeaneum, on which Chiron is teaching young Achilles to play
9. An Egyptian Systrum
10. An ancient Lyre richly ornamented
- V. Indian Musical Instruments
- Fig. 1. From an original Indian Painting
2. The Been, an Indian Musical Instrument
- VI. Pandean Minstrels in performance at Vauxhall
- Welsh Harps
Single Harp

MUSICAL INSTRUMENTS.

- PLATE VII. Ancient Triple Harp
Modern Triple Harp
(For *Guitar*, referred to this Plate, see Plates IX. XIII. & XV.)
- VIII. Fig. 1—5. Origin of the Bow
- IX. Russian Musical Instruments
Gondok Rebec with three strings
Gelaika
Double Flutes of the Ancients
Rok, or Hunting Horn of Siberia
Rojok
Batalaika, Guitar with two strings
Harps
- X. Fig. 1, 2. Harp of Brian Boromh
3. Silver Prize Harp
4. Bell Harp
- XI. Fig. 1. English Common Flute
2. German Flute
3. Improved Ditto, with additional keys
4. 5. Hautboys
6. B Fife
7. C Fife
8. English Flageolet
9. Gong
10. Tabour
11. Pipe
- XII. Fig. 1, 2. Hunting Horns
3. Serpent
4. French Horn
5. Bugle
6. Sacbut or Trombone
- XIII. Fig. 1. Arch Lute
2. Mandoline
3. Mandola
- XIV. Fig. 1. Violin
2. Bow
3. Sordine or Mute
4. Violoncello
5. Violino Piccola, or Kit
6. Viol de Gamba of the 16th Century

NAVAL ARCHITECTURE.

- PLATE XV. Fig. 1. Viol d'Amour
2. Mandore
3. Spanish Guitar
4. Lute
Chinese Musical Instruments
Ching
King
(See MISCELLANY, Plate I. fig. 8, 9.)
- NAVAL ARCHITECTURE.
- I. Draught of a Ship of 74 Guns
Sheer Plan
Half-breadth Plan
Body Plan
Perpendicular View of the Stern
- II. Disposition of the Frame of a Ship of 74 Guns
Frame
- III. Profile of a Ship of 74 Guns, inboard work
- IV. Plans of a Ship of 74 Guns
Plan of the Gun Deck
Orlop
(Numbered Plate VI.)
- VI. Plans of the Quarter Deck, Forecastle, and Upper Deck of a Ship of 74 Guns
- VII. Fig. 1—10. A Ship of 74 Guns, laying off A
- VIII. Fig. 1—12. A Ship of 76 Guns, laying off B
- IX. Fig. 1—12. A Ship of 74 Guns, laying off C
- X. Fig. 1—8. A Ship of 74 Guns, laying off D
- XI. Frigate of 38 Guns
- XII. An East Indianman
- XIII. Royal Sovereign Yacht
- XIV. Fig. 1—3. Scale of Tons
4—8. Whole Moulding
3—6. Hill's Machine for drawing Ships' Bolts
(See also MECHANICS, Plate XXII. XXIII.)

PLATES. VOL. IV.

NAVIGATION—WRITING BY CIPHER.

- PLATE NAVAL TACTICS.
- I. Fig. 1—3. Convoy
(See NAVIGATION, Plate III.)
- NAVIGATION.
- I. & II. Fig. 1. Astrolabe
(See ASTRONOMICAL INSTRUMENTS, Plate I. fig. 1.)
2. Backstaff
(See ASTRONOMICAL INSTRUMENTS, Plate I. fig. 2. There are some inaccuracies in the letters of reference, which the reader will easily correct on inspection)
Fig. 1. Meridian
- VOL. XXXIX.

- PLATE I & II. Fig. 2, 3. Meridional Parts
(Referred to as Plate II. fig. 8, 9.)
4—8. Tide
(Referred to as GEOGRAPHY, Plate I. fig. 10—14.)
7. Forestaff
(See ASTRONOMICAL INSTRUMENTS, Plate I. fig. 3.)
- (II.) Fig. 1—3. Hadley's Quadrant, theory of
4. Sinecal Quadrant
5, 6. Rhumb Line
7. Variation
8, 9. Ditto
(Referred to as ANALYSIS, Plate XIII. fig. 1, 2.)
8, 9. Meridional Parts
(See Plate I. fig. 2, 3.)
- 4 U

OPTICS.

PLATE

(II.) Fig. 10. Nocturnal
(See ASTRONOMICAL INSTRUMENTS, *Plate I.*
fig. 6.)

II. & IV. Fig. 1—4. Rudder
5—18. Plain Sailing
II. Fig. 19. Plain Sailing
20—23. Parallel Sailing
24, 25. Mercator's Sailing
26—34. Great Circle Sailing

III. Fig. 1, 2. Traverse Sailing
3—6. Current Sailing
1—3. Naval Tactics
(Referred to as NAVAL TACTICS, *Plate I.* *fig.*
1—3.)
1—5. Trigonometry
(Referred to as TRIGONOMETRY, *Plate III.*
fig. 1—5.)

NOTATION.

Plate of Arithmetical Characters
(See *Miscellany*, *Plate I.* *fig. 7.*)

OIL MILL.

Smeaton's Oil Mill
1. Plan
2. Elevation

OPTICS.

I. Fig. 1. Aberration
2—4. Angle
5. Burroughs's Machine, Perspective View
(Referred to as *Plate II.* *figs. 4, 5.*)
13. Altitude
(See *Plate IV.* *fig. 11.*)

II. Fig. 1—3. Parker's Burning Lens
4, 5. Burroughs's Machine
(See *Plate I.* *fig. 5.*)

III. Fig. 1—7. Camera Obscura

IV. Fig. 1, 2. Catoptric Cistula
2*—4. Dioptrics
5, 6. Dispersion of Light
8. Focus
(Referred to as *Plate V.* *fig. 2.*)
9. Looking Glafs
(Referred to as *Plate IX.* *fig. 10.*)

10—13. Shadow
14—16. Visible
17. Vision
V. & VI. Grinding, &c.
(V.) Fig. 1. Virtual Focus
2. Eye
2. Focus
(See *Plate IV.* *fig. 8.*)
3—7. Grinding Machine

(VI.) Fig. 5—11. Lens

VI. Fig. 1. Heliostata
2. Bed of Hones
3. Horopter
4. Refraction
(This figure is not numbered)

VII. Fig. 1—12. Lens

OPTICS.

PLATE

VIII. Fig. 1—12. Lens

IX. Fig. 1—9. Light
10. Looking Glafs
(See *Plate IV.* *fig. 9.*)

X. Fig. 1—3. Magic Lantern
4. Apparent Magnitude
5—11. Micrometer

XI.

Fig. 1. Dr. Maskelyne's
2—4. Troughton's
5. Herchel's Lamp Micrometer
6. Ditto, the arm enlarged
7, 8. Ditto, the lamp open with the
weight W
9. Ditto, the lamp shut
(Fig. 7, 8, 9. are not numbered on the Plate)
10. Microscope
(The same as *Plate XII.* *fig. 1.*)

XII. Fig. 1—12. Microscope, Single
XIII. Microscopes

Fig. 1. Marshall's
2. Culpepper's
3, 4. Reflecting Microscope
5. Dr. Smith's Ditto
6—8. Solar Microscope
(For Mirror, see *Plate XV.*)

XIV.

Compound Microscope

1—4. Adams's
5—11. B. Martin's

XV.

Fig. 1. Incidence, Inclination
2—18. Mirror
18. Mufcæ Volitantes
19, 20. Centering Object Glafs
21. Opera Glafs
22. Optical Inequality
23, 24. Parhelion
(Referred to as *Plate XVII.* *fig. 8, 9.*)
Microscope, (see *Plate XVI.*)

XVI.

Fig. 1—8. Improved Solar Microscope
(This is referred to under the article MICROSCOPE
as OPTICS, *Plate XV.*)
(For Opera Glafs, see *Plate XV.* *fig. 21.*)

XVII.

Fig. 1—8. Optometer, &c.
9. Optic Place
10. Pencil of Rays
(The reference to *fig. 11.* under PLACE, in *Optics*,
should be to *fig. 9.*)

11, 12. Polyhedron
(Referred to as *fig. 12, 13*)
12. Polemofcope
13. Polyoptum
(Referred to as *fig. 14.*)

14. Reflection
15. Reflexibility

(For Parhelion, see *Plate XV.* *fig. 23, 24.*)

XVIII.

Rainbow, Refraction
Fig. 1—9. Rainbow

10—24. Refraction of Light

XIX.

Fig. 1—15. Refrangibility of Light

XX.

Fig. 1—4. Shadow
(See OPTICS, *Plate IV.* *fig. 10—13.*)

5—7. Visible
(See *Plate IV.* *fig. 14—16.*)
8. Vision, theory of
(See *Plate IV.* *fig. 17.*)

PLANETARY MACHINES.

PLATE

ORGAN.

- I. Fig. 1—13. Detached Parts
- II. Interior Profile of an English Church Organ
- III. Fig. 1—5. Organ made by Flight and Robfon for the Earl of Kirkwall
- IV. Fig. 6—14. Flight and Robfon's Organ

PAINTING.

- I. Fig. 1, 2. Apollo Belvidere
3, 4. Venus de Medicis
- II. Fig. 1—8. Diversities of the Human Face
- III. Diversities of the Human Face
American, Nootka Sound
European
Afiatic, Palestine
Afiatic, Chinese
African, Hottentot

PANORAMA.

- I. Fig. 1. Fig. 2. No. 1—7. Fig. 3.
- II. Fig. 1—5.

PAPER MILL.

- I. Fig. 1. Elevation
2. Plan
- II. Fig. 1—8. Machinery.

PERSPECTIVE.

- I. Fig. 1—8. Anamorphosis
9. Distance of a Vanishing Line
10. Point of Ditto
11, 12. Horizontal Line
- I. Fig. 1—6. Theory of Perspective
- II. Fig. 1—15. Ditto
- III. Fig. 1—16. Ditto
- IV. Fig. 1—15. Ditto
- V. Fig. 1—6. Ditto
- VI. Fig. 1. No. 1—3. Fig. 2. No. 1—4.
- VII. Fig. 1. No. 1—3. Fig. 2. No. 1, 2. Fig. 3—6.
- VIII. Fig. 1. No. 1—3. Fig. 2—5. Fig. 6. No. 1, 2.
- IX. Fig. 1—10. Fig. 11. No. 1—4.
- X. Fig. 1. No. 1—6. Fig. 2. No. 1—4. Fig. 3, 4.
- XI. Fig. 1. No. 1, 2. Fig. 2. No. 1, 2. Fig. 3. No. 1, 2. Fig. 4. No. 1, 2. Fig. 5—9. Fig. 10. No. 1, 2. Fig. 11—17.
- XII. Fig. 1—6. Fig. 7. No. 1, 2. Fig. 8. No. 1, 2. Fig. 9, 10.

PISE BUILDINGS.

(The Plate thus headed is AGRICULTURE, Plate XXXIII.)

PLANETARY MACHINES.

- I. Fig. 1, 2. Cometaryum
- II. Fig. 1—3. Cometaryum, by W. Jones
- III. Equation Mechanism of a Planet's Orbit
Fig. 1. By Huygens

PNEUMATICS.

PLATE

- III. Fig. 2. By Mr. Joseph Priestley
3—5. By Rev. W. Pearson
- IV. Fig. 1—6. Equation Mechanism of a Planet's Orbit by the Rev. W. Pearson
- V. First Portion of the Orrery for Equated Motions
- VI. Fig. 1—3. Janvier's Orrery
- VII. Fig. 1—4. Section of the Improved Orrery for Mean Motions
- VIII. Perspective View of the Improved Orrery for Mean Motions, by the Rev. W. Pearson
- IX. Dials graduated for shewing different Planetary Phenomena
Fig. 1. Dial for the Equation of the Sun's Centre
2. Ditto, Sun's Declination
3. Ditto, Reduction of the Ecliptic to the Equator
4. Ditto, Moon's Mean Equation of the Centre
5. Ditto, Moon's Mean Heliocentric Latitude
6. Ditto, Moon's Horizontal Parallax only
7. Ditto, Moon's Mean Horizontal Diameter and Parallax
8. Ditto, Equation of the Mean High Tides
- X. Fig. 1—5. Planetarium of the Royal Institution, by Mr. Pearson
- XI. New Planetarium for Equated Motions by Dr. Pearson
Fig. 1. Elevation
2. Plan of the Movement for the Arm of Saturn
- XII. Fig. 1. Roemer's Satellitian
2—4. Pearson's Ditto
5. Janvier's Jovilabe
- XIII. Fig. 1—3. Pearson's Large Machine for Jupiter's Satellites

PLANING MACHINE.

- I. Fig. 1—6. Mr. Bramah's Machine
- II. Fig. 8—13. Ditto

PLATED MANUFACTURE.

- Fig. 1, 2. Die Stamp
- 3. Bit Swage for Mountings
- 4. Common Swage
- 5—7. Parts of the Machine
- 8—10. Grooved Rollers for Beads, &c.
- 11. Embossing Punches
- 12. Furnace

PNEUMATICS.

- I. Fig. 1—12. Aeroftation
- II. Fig. 5—8. Ditto
- III. Fig. 14—23. Air Gun
- IV. & V. (Numbered Plate VI.) Fig. 24, 25. Air Pump, and Experiments on Air
(V.) Fig. 26—32. Experiments on Air
V. Fig. 33—44. Ditto
4 U 2

PNEUMATICS.

- PLATE
 VI. Fig. 45. Smeaton's Air Pump
 46, 47. Nairne's Ditto
 VII. Fig. 48—55. Air Pump, and Experiments on Air
 VIII. Fig. 56, 57, & 68. Ditto
 VIII. } Fig. 58—62. Ditto
 No. 2. } 63—66 Cuthbertson's Air Pump
 69. Anemometer
 70, 71. Arzometer
 72. Atmosphere
 73. Bacchus
 (Referred to as Plate IX. fig. 73.)
 Barometer
 IX. Fig. 73. Bacchus
 (See the preceding Plate, fig. 73.)
 74, 75. Auzont's Experiment
 76. Common Barometer
 77. Des Cartes'
 78. Huygens's
 79. Dr. Hooke's
 80. Horizontal
 81. Diagonal
 82. Wheel
 83. Pendant
 84. Chamber
 85. Vernier
 X. Fig. 86, 87. Marine Barometer
 88. Calwell's
 89, 90. Rowning's
 Barometer
 XI. 91. Machine for enlarging the Scale of the
 Barometer
 92, 93. Keith's Barometer
 94. De Luc's Ditto
 95. Thermometer
 96, 97. Hamilton's Barometer
 98, 99. Phenomena of the Barometer
 XII. Fig. 100—106. Jones's Portable Barometer
 XIII. Fig. 107—117. Bellows
 XIV. Fig. 1, 2. Condensers
 3. Condensing Engine
 4. Pear Gage
 5—7. Gage of a Condenser
 4—7. Freezing
 8. Freezing Apparatus
 XV. Fig. 1—7. Pyrmont Water, Apparatus for
 preparing
 8. Whisping Place
 9, 10. Lind's Wind Gage
 11. Martin's Ditto
 12. Bouguer's Ditto
 13. Leslie's Thermometer
 (Referred to as Plate XVI. fig. 17.)
 14. Kewley's Thermometer
 (Referred to as Plate XVI. fig. 18.)
 XVI. Thermometer
 Fig. 1. Drebhel's Air Thermometer
 2. Bent Thermometer
 3. Bernoulli's Ditto
 4. Amonton's Ditto
 5. Florentine Ditto
 6—10. Apparatus for adjusting the fixed
 Points of Thermometers
 11—13. Cavendish's Thermometer
 14, 15. Mr. Six's Ditto

PROPORTIONAL COMPASSES.

- PLATE
 XVI. Fig. 16. Rutherford's Ditto
 17. Leslie's Ditto
 (See Plate XV. fig. 13.)
 18. Kewley's Thermometer
 (See Plate XV. fig. 14.)
 XVII. Fig. 1—7. Ventilator
 PORTER BREWERY.
 Fig. 1—5. Section of the Building and Machinery
 POTTERY.
 Vertical Section of a Furnace
 Horizontal Section
 PRESS.
 Fig. 1—7. Bramah's Hydrostatic Press
 PRESSURE.
 Water Pressure Engine
 (See ENGINE, Plate I.)
 PRINTING.
 I. Fig. 1—6. Stanhope or Iron Press
 II. Fig. 1—6. Bramah's Bank-Note Printing Machine
 III. Fig. 1. Bacon and Donkin's Printing Machine
 IV. Fig. 1. Perspective View of a common Printing
 Press
 2. Composing Stick
 PROJECTION.
 I. Fig. 1—13.
 II. Fig. 1—7. Fig. 8. No. 1, 2. Fig. 9, 10.
 (The reference to fig. 13. should be to fig. 10.)
 III. Fig. 1. No. 1—6. Fig. 2. No. 1—6.
 IV. Fig. 1. No. 1—3. Fig. 2. Fig. 3. No. 1, 2.
 Fig. 4. No. 1—3. Fig. 5—11.
 V. Fig. 1—4. Fig. 5. No. 1—3. Fig. 6—9.
 VI. Fig. 1—5. Fig. 6. No. 1, 2. Fig. 7. No. 1, 2.
 VII. Fig. 1—12.
 VIII. Fig. 1. No. 1, 2. Fig. 2—9.
 IX. Fig. 1—14.
 X. Fig. 1. No. 1, 2. Fig. 2. Fig. 3. No. 1, 2.
 Fig. 4. No. 1, 2. Fig. 5—13.
 (These figures are at the bottom of the Plate, and
 are numbered fig. 1. No. 1. and fig. 1. No. 2.)
 PROPORTIONAL COMPASSES.
 I. Fig. 1—10.
 (The reference to fig. 10. at the end of the Scale
 of Tangents, should be to fig. 11.)
 11—14. Fig. 15. No. 1, 2. Fig. 16, 17.
 No. 1.
 (The last figure wants the letter Z in the centre, at
 the intersection of the lines A E and C G)
 17. No. 2.
 (This figure wants the letter X at the bottom)

SHIPS.

PLATE

PYROTECHNY.

Fig. 1—17. Fireworks.
(The reference under ROCKET to fig. 18. should be to fig. 17.)

RIGGING.

- I. Fig. 1—49.
(See SHIPS, Plate II.)
II. Fig. 1—23.
(See SHIPS, Plate III.)
III. Fig. 1, 2.
(See SHIPS, Plate IV.)
IV. Fig. 1, 2.
(See SHIPS, Plate V.)

SCENOGRAPHY.

- I. Fig. 1—10.

SCULPTURE—Statues.

- I. Cupid and Psyche, from an Antique Marble Group, in the Capitol
II. The fame seen in different Views
I. Hercules of Praxiteles
Cupid of Praxiteles
Minerva of Dipænus and Scyllis
Venus of Praxiteles
Jupiter Olympius
Minerva of the Acropolis, in Athens
II. Hercules Farnese
Phocion
Dirce
III. Venus de Medicis
Apollo Belvidere
Laocoon
IV. Durga slaying Mahishasura; a Hindû Group
An Etruscan Patern, in the British Museum
A Colossal Statue, at Thebes
Persian Sculpture, at Persepolis
A Chinese Statue
Persian Sculpture, at Persepolis

SHADOW.

- I. Fig. 1. No. 1, 2. Fig. 2—6.
II. Fig. 1—5.

SHIP-BUILDING.

(See NAVAL ARCHITECTURE.)
Construction of Boats
(See above, under the head BOATS)

SHIPS.

- I. Fig. 1. Bolton's Machine for drawing Bolts
2, 3. Phillips's Tubes for driving Ditto
4. King Rope
5. Bits
6, 7. Nippers

SILK MANUFACTURE.

PLATE

- II. Rigging, Plate I.
Fig. 1—15. Knotting
16—24. Hitches
25—32. Bends
33—42. Splices
43—49. Hawser
III. Rigging, Plate II.
Fig. 1—23. Blocks, Pendants, Braces, Stays, &c.
IV. Rigging, Plate III.
Fig. 1. Standing Rigging
2. Running Rigging
V. Rigging, Plate IV.
Fig. 1, 2. Rigging, and bending the Sails, &c.
VI. First Rate Man of War
Man of War's Barge
Seventy-four
Lugger
Fire Brig
Flat-bottomed Boat
Gun Vessel (the Wolverine)
Man of War's Long Boat
VII. Boats
Pahie
Balza
Corracore
Life Boat
Spring Block, Fig. 1, 2.
(Some of the preceding figures are referred to as on BOATS, Plate II.)
VIII. Masts. The different Pieces which compose the Main Mast of a 74 Gun Ship
IX. Anchors and Buoys
Nun Buoy
Anchor
Kedge Anchor
Floating Ditto
Fire Grapple
Anchor Shoe
Grapple
Can Buoy
Creepers
Jew's Harp
Swivel Ring
Road, or Mooring Anchor
Foul Hawse
Flat Anchor in Use
Fig. 1, 2. Block, Spring
(See Ships, Plate VII.)
- SHORT-HAND.
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- III. Fig. 1—7. Fig. 8. No. 1.
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- I. Fig. 1—8.
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- Fig. 1. Needles
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STONEHENGE.

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3. Smaller Ditto
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9. Tenaculum
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- III. Fig. 1—3. Needles for sewing up Wounds
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Trepanning Instruments
- VIII. Fig. 1. Rodman's Trepanning Instrument
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PLATE

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 4, 5. Sciffars for enlarging the Wounds of the Cornea
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 7—10. Anel's Syringe and Pipes
 11. Ware's Stiles
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 13. Small Lancet for puncturing the Lachrymal Sac
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- XI.
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 3. A slender round Couching Needle
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 7. Hey's Couching Needle
 8, 9. The same magnified
 10, 11. Wathen and Phipps's Knives for Extraction
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 13. Wenzel's Ditto
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 15, 16. Knives for enlarging the Wound of the Cornea
 17. Forceps for taking away Pieces of the Capfule
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SURVEYING.

- I. & VI. Fig. 1. Protractor
 2. Semicircle (*See Plate VII. fig. 3.*)
 3—9. Chain, Measuring by
 10. Convergency of Meridians (*Referred to as Plate II. fig. 10.*)
- (VI.) Fig. 1, 2. Level, Common Spirit
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- (III.) Fig. 1—6. Cross
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- IV. Fig. 1. Foot Level
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- V. Fig. 1—3. Levels by Mr. Ramfden
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- VI. Levels (*See Plate I.*)
- VI. Fig. 1—8. Plain Table
 9, 10. Perambulator
 11. Plotting Scale
 12. Scale
 13. Quadrant for measuring Heights
 14. Carpenter's Rule
- VI. Fig. 7, 8. Dendrometers (*Referred to as on Plate III.*)
 9—11. Mr. Broad's Machine for measuring Timber
- VII. Levelling
 Fig. 1, 2. Adjustment of Level
 3. Principles of Levelling; true and apparent Level
 4—9. Practice of Levelling
 10. Levelling Staves
- VII. Fig. 1, 2. Sector
 3. Semicircle
 4. Everard's Sliding Rule
 5. Coggeshall's Ditto
 6—9. Roget's Ditto
- VIII. Fig. 1—5. Grand Theodolite, by Ramfden
- IX. Fig. 1—9. Portable Theodolite, by Troughton
- X. Map of an Eitate, near East Sheen, surveyed by James Wadmore, jun.

TELEGRAPH.

- Fig. 1—13. Vocabulary and Machinery

TRIGONOMETRY.

- I. Fig. 1—3. Gunter's Scale
 4. Secant and Sine
 5—7. Sector

WATER WORKS.

PLATE

- I. Fig. 8, 9. Arithmetic of Sines
 10. Sine
 11. Figure of Sines
 12. Cofines
 13. Veried Sines
 14. Tangents
 15. Cotangents
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 18—22. Sines
- II. Fig. 1, 2. Spherical Angle
 3—8. Triangle
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 13. Tangent
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- III. (*The figures referred to as on TRIGONOMETRY, Plate III. are on NAVIGATION, Plate III.*)

TURNING.

- Fig. 1—42. Lathe, and detached Parts of the Machinery and Instruments

VEGETABLE ANATOMY.

- I. Fig. 1—11. Bark
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VOLTAISM.

- I. Fig. 1—8. Battery, &c.
 (*This is the only Plate of Voltaism.*)

WATER WHEELS.

- I. Overshot and Undershot
 Fig. 1. Mr. Smeaton's Breat Wheel
 2. Pentrough
 3, 4. Mr. Nouaille's Overshot Wheel
 4 5. Buchanan's improved Wheel and Pentrough
 6. Chain of Buckets
 7. Improved Breat Wheel
 8. Greasing Machine
- II. Fig. 3. Breat Wheel with two Shuttles at Messrs. Strutt's Works
 4. Ditto improved, at the Royal Armoury Mills
 5. Burns's Overshot Wheel
 9. Method of laying on Water

WATER WORKS.

- I. Machines for raising Water
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 Fig. 1. Momentum Pump
 2, 3. Mr. Boulton's Machine for raising Water
 4—6. Hydraulic Ram
 7. Mr. Whitehurst's Machine for raising Water
 8. Siphon Machine
 9. Machine for raising Water by the lateral Communication of a Stream
 10. Goodwin's Siphon Machine

WRITING BY CIPHER.

PLATE

- I. Fig. 11. Spiral Pump, or Zurich Machine
 13. Greaves's Bucket Machine
 14. Chrenniz Fountain
 15. Water Bellows
- II. Fig. 1—8. Mr. Smeaton's Great Engine for raising Water at London Bridge

WATER PRESSURE ENGINE.

- Fig. 1—5. Smeaton's Water Pressure Engine

WEAVING.

- I. Mr. Aullin's Engine Loom Shuttle
 II. Fig. 1—4. Looms, &c.

WINDMILL.

- I. Fig. 1. Captain Hooper's Horizontal Windmill, Upright Section
 2. Ditto, Plan
 3—5. Smock Mill
 (*This Plate is not numbered.*)
- II. Fig. 1. Common Vertical Windmill
 2. Smock Mill
 3. Internal Mechanism of a Post Windmill
 4. Dutch Windmill
 5—7. Parts of the Mechanism of a Windmill
 (*The reference under "Rules for modelling the Sails of Windmills," is fig. 4, Plate II.*)
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WINDING ENGINE.

- Smeaton's Design for a Water Gin, for drawing Coals from the Pits
 Fig. 1. Plan
 2. Elevation of the Frame on the Pit Head
 3, 4. Elevations
 5. Plan

WIRE-MILL.

- Fig. 1—13. Machinery for Wire-Drawing

WOOLLEN MANUFACTURE.

- I. Stubbing Machine, or Billy
 II. Spinning Jenny
 III. Shearing Machine
 IV. Carding Engine
 (*This Plate is not numbered*)
 V. Gig-Mill

WORSTED MANUFACTURE.

- I. Fig. 1. Combs
 2. Supporter for Ditto
 3. Stove for heating Ditto
 4. Gilpin's Combing Machine
 5. Breaking Frame
 6. Roving Ditto
 7. Spinning Ditto
- II. Fig. 1—3. Cartwright's Combing Machine

WRITING BY CIPHER.

- I.—III. Characters and Examples

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NATURAL HISTORY.

GENERAL SYSTEMATIC ARRANGEMENT OF THE PLATES OF
NATURAL HISTORY,

INCLUDING THE THREE KINGDOMS OF NATURE, ACCORDING TO THE
SYSTEM OF LINNÆUS.

* * The Arabic Numerals on the Left, denote the Number of the Plates, according to the Systematic Arrangement of them in the Catalogue.

PLATE

ANIMALS.

CLASS MAMMALIA.

ORDER I. PRIMATES.

GENUS HOMO

- 1* *Homo Sapiens*, Rational Man
(See Plates PAINTING)
Anatomical Structure
(See Plates ANATOMY)
- 2* Varieties of *Homo Sapiens*, Rational Man, according to Climate
- α *Americanus*, American Man
β *Europæus*, European
γ *Asiaticus*, Asiatic, (of Palestine)
(of China)
- δ *Afer*, African
(See PAINTING, Plate III.)

GENUS SIMIA.

1. Lettered MAMMALIA, Order I. Primates. Plate I.
- Fig. 1. *Simia Satyrus*, Black Oran Otan, or Outang, *Homo Sylvestris*, var. *Pongo*
2. — var. *Jocko*, Chefnut Outan, or Outang
3. *Simia Troglodytes*, (Gmel.) *Satyrus indicus* Tulipii. *Chimpanzee*
4. *Simia Lar*, (Gmel.) Long-armed Ape
Simia longimana, (Schreb.)
5. *Simia Inuus*, Barbary Ape
6. *Simia Sylvanus*, Pigmy Ape

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PLATE

1. Fig. 7. *Simia Œdipus*, Red-tailed Ape
8. *Simia Jacchus*, Striated Ape

GENUS LEMUR.

2. Lettered MAMMALIA, Order Primates, Genus Lemur, Plate II.
- Fig. 1. *Lemur Podje*, Tarsier Lemur
2. *Lemur ecaudatus*, Tailless Lemur, or Maucauco
3. *Lemur murinus*, Murine Lemur
4. *Lemur Catta*, Ring-tailed Lemur, or Maucauco
5. *Lemur tardigradus*, Loris Lemur
6. *Lemur volans*, (Linn.) Flying Lemur, or Flying Colugo?
- * GENUS GALEOPITHECUS (*Rufus*) Audebert

GENUS VESPERTILIO.

3. Lettered MAMMALIA, Genus Vespertilio, Plate III.
- Fig. 1. *Vespertilio Vampyrus*, Vampire Bat
2. *Vespertilio auritus*, Long-eared Bat
3. *Vespertilio Spasma*, Cordated Bat
4. *Vespertilio leporinus*, Peruvian Bat
5. *Vespertilio Spectrum*, Spectre Bat

ORDER BRUTE.

GENUS BRADYPUS.

4. Lettered Clafs MAMMALIA, Order Brute, Genus Bradypus
- Fig. 1. *Bradypus tridactylus*, Three-toed Sloth
2. *Bradypus didactylus*, Two-toed Sloth
+ X

GENUS MYRMECOPHAGA.

4. Fig. 3. *Myrmecophaga didaëyla*, Two-toed or small Ant-Eater
 4. *Myrmecophaga tetradaëyla*, Four-toed Ant-Eater
 5. *Myrmecophaga jubata*, Great Ant-Eater

GENUS ORNITHORINCHUS.

- Fig. 6. *Ornithorinchus paradoxus*, Duck-bill
Platypus anatinus, (Shaw,) Duck-billed Platypus

GENUS MANIS.

5. Lettered MAMMALIA, Quadrupeds, Genus Manis
 Fig. 1. *Manis pentadaëyla*, (Linn.) Five-toed Manis, or Short-tailed Manis
 2. *Manis tetradaëyla*, (Schreb.) Four-toed Manis, or Long-tailed Manis

GENUS DASYPUS.

3. *Dasyfus sexcinctus*, Six-banded Armadillo
 4. *Dasyfus novemcinctus*, Nine-banded Armadillo
 5. *Dasyfus duodecincinctus*, (Schreb.) Twelve-banded Armadillo
Dasyfus unicinctus, (Linn. et Gmel.) Ditto

GENUS RHINOCEROS.

6. Lettered QUADRUPEDS, Mammalia, Order Bruta, Rhinoceros. Plate.
 Fig. 1. *Rhinoceros unicornus*, One-horned Rhinoceros
 2. *Rhinoceros bicornis*, Two-horned Rhinoceros

GENUS SUKOTYRO.

(*A doubtful genus not admitted by Gmelin*)

7. Lettered QUADRUPEDS, Genus Sukotyro
 Fig. 1. *Sukotyro Indicus*, Sukotyro
 (From Nieuboff, the Dutch traveller, and Curchill's Collection of Travels)

GENUS ELEPHAS.

- Fig. 2. *Elephas maximus*, Elephant

ORDER FERÆ.

GENUS TRICHECHUS.

8. Lettered QUADRUPEDS, Class Mammalia, Genus Trichechus
 Fig. 1. *Trichechus Rosmarus*, Arctic Walrus, or Morfe
 2. *Trichechus Manatus*, *β borealis*, Whale-tailed Manatus

GENUS PHOCA.

- Fig. 3. *Phoca Ursina*, Urfine Seal
 4. *Phoca groenlandica*, Harp Seal
 5. *Phoca Vitulina*, Sea Calf, or Common Seal
 6. *Phoca maculata*, Kurile or Spotted Seal

GENUS CANIS.

9. Lettered QUADRUPEDS, Dogs, Plate II. of Order FERÆ

- Fig. 1. *Canis familiaris*, Shepherd's Dog?
 2. *Dingo*, *Australasian*, or New Holland Dog
 3. *Canis familiaris*, var. Pomeranian Dog
Canis β pomeranus, Ditto
 4. *Canis* var. *Sibiricus*, Siberian Dog
 5. Iceland Dog?
 6. var. *Aquaticus minor*, Small Barbet, or Water Dog
 7. var. *Aquaticus*, Great Barbet, or Water Dog

10. Lettered QUADRUPEDS. Plate III. Dogs, Genus XV. Canis

- Fig. 1. var. *brevipiliis*, King Charles's Dog
 2. Pyrama
 3. var. *Ægypticus*, Naked or Turkish Hound
 4. *fricator*, Pug-dog
 5. Spaniel
 6. Shock
 7. var. *variegatus*, Small Dane
 8. *leoninus*, Lion Dog
 9. *hybridus*, Roquet

11. Lettered QUADRUPEDS, Plate V. Dogs, Genus XV. Canis

- Fig. 1. var. *Anglicus*, Mastiff
 2. *Moleffus*, Bull-dog
 3. Great Danish, or Harlequin-Dog
 4. Dalmatian Dog

12. Lettered QUADRUPEDS, Dogs, Plate IV. of Order Feræ, Genus XV. Canis

- Fig. 1. Old English, or Talbot Hound
 2. Beagle
 3. Harrier
 4. Blood Hound

13. Lettered QUADRUPEDS, Dogs, Plate V. of Order Feræ, Genus XV. Canis

- Fig. 1. Stag Hound
 2. Fox Hound
 3. Larger Terrier
 4. Smooth Terrier
 5. Rough Terrier

14. Lettered QUADRUPEDS, Order Feræ, Genus Canis (No number on the Plate)

- Fig. 1. *Canis Lupus*, Wolf
 2. *Canis Hyæna*, Striped Hyæna
 3. *Canis Mesomelas*, Cape Jackal
 4. *Canis Vulpes*, Common Fox
 5. *Canis Lagopus*, Arctic Fox

GENUS FELIS.

15. Lettered QUADRUPEDS, Plate I. Genus Felis, Lions

- Fig. 1. *Felis Leo*, Lion, Lions, and Young

PLATE

16. Lettered QUADRUPEDS, Plate II. Order 3, Genus

Felis

- Fig. 1. *Felis Tigris*, Tiger
2. *Felis Pardus*, Panther
3. *Felis Leopardus*, Leopard

17. Lettered QUADRUPEDS, Genus Felis, Tigers, Plate II.

- Fig. 1. *Felis Puma*, Congouar
2. *Felis Lynx*, Lynx
3. *Felis Uncia*, Ounce
4. *Felis Caracal*, Persian Lynx
5. *Felis Onca*, Jaguar
6. *Felis jubata*, Hunting Leopard

18. Lettered QUADRUPEDS, Plate III. of Order Feræ,
Genus Felis

- Fig. 1. *Felis pardalis*, Ocelot
2. *Felis Tigrina*, Margay
3. *Felis Serval*, Serval
4. *Felis Catus*, } Wild Cat
 α ferus, }
5. *Felis β domesticus*, Tame or domesticated
 Tortoiseshell Cat
7. *Felis γ angorensis*, Angora Cat
8. *Felis ε caruleus*, Slate-coloured Cat, (Blue or
Chartreux.)

GENUS VIVERRA.

19. Lettered QUADRUPEDS, Order Feræ, Genus Viverra
(No number on the Plate)

- Fig. 1. *Viverra Zibetha*, Zibet, or Indian Musk
Weefel
2. *Viverra Fossa*, Fossane
3. *Viverra Ichneumon*, Ichneumon Weefel
4. *Viverra Naja*, Brazilian Weefel
5. *Viverra Civetta*, Civet Weefel, or Civet-
Cat, African Musk Weefel

20. Lettered QUADRUPEDS, Order Feræ, Genus Mustela
(No number on the Plate)

- Fig. 1. *Mustela Lutris*, Sea Otter, Greater Otter
2. *Mustela Lutra*, Common Otter
3. *Mustela Foina*, Martin
4. *Mustela Zibellina*, Sable, or Fisher Weefel

GENUS URSUS.

21. Lettered QUADRUPEDS, Order Feræ, Genus Ursus
(No number on the Plate)

- Fig. 1. *Ursus Americanus*, American Bear
2. *Ursus maritimus*, (Gmel.) Polar Bear
- Ursus marinus*, (Pallas) U. Albus, Briff.
3. *Ursus Gulo*, (Schreb.) Glutton
4. *Ursus Meles*, Badger

GENUS DIDELPHIS.

22. Lettered QUADRUPEDS, Genus Didelphis, &c.
(No number on the Plate)

- Fig. 1. *Didelphis Opossum* (Gmel. Schreb.) Virgi-
nian Opossum
 Didelphis Virginiana (Shaw) Ditto
2. *Didelphis peltatus* (Shaw) *volans*, New
Holland Flying Opossum
3. *Didelphis Murina*, Murine Opossum

PLATE

GENUS MACROPUS.

22. Fig. 4. *Macropus Kangaroo*, a. male, b. female

GENUS TALPA.

23. Lettered QUADRUPEDS, Order Feræ, Genus Talpa, &c.
(No number on the Plate)

- Fig. 1. *Talpa Capensis*, Cape Mole
2. *Talpa longicaudata*, Long-tailed Mole
3. *Talpa Europæa*, European Mole

GENUS SOREX.

- Fig. 4. *Sorex minutus*, Minute Shrew
5. *Sorex moschatus*, Musky Shrew
6. *Sorex araneus*, Fetid Shrew

GENUS ERINACEUS.

- Fig. 7. *Erinaceus Europæus*, Common Hedgehog
8. *Erinaceus ecaudatus*, Madagafcar Hedgehog

ORDER GLIRES.

GENUS HYSTRIX.

24. Lettered QUADRUPEDS, Order Glires, Genus Hystrix
(No number on the Plate)

- Fig. 1. *Hystrix cristata*, Common or crested Por-
cupine
2. *Hystrix prehensilis*, Brazilian Porcupine
3. *Hystrix dorsata*, Canadian Porcupine (white
variety)

GENUS CAVIA.

- Fig. 4. *Cavia Aguti*, Long-nosed Cavy
5. *Cavia Magellanica*, Patagonian Cavy
6. *Cavia Paca*, Spotted Cavy

GENUS CASTOR.

25. Lettered QUADRUPEDS, Order Glires, Genus Castor
(No number on the Plate)

- Fig. 1. *Castor Fiber*, Common Beaver

GENUS MUS.

- Fig. 2. *Mus zibethicus*, Musk Rat
3. *Mus decumanus*, Norway Rat
4. *Mus musculus*, Common Moufe
5. *Mus Cricetus*, German Hamster Rat
6. *Mus burfarius*, Purple Rat or Canada Rat
7. *Mus capensis*, Cape Mole-Rat

GENUS ARCTOMYS.

26. Lettered QUADRUPEDS, Order Glires, Genus Arc-
tomy's, &c.
(No number on the Plate)

- Fig. 1. *Arctomys Citillus*, (Schreb.) Variegated
Marmot
2. *Arctomys Empetra*, Canadian Marmot

GENUS SCIURUS.

- Fig. 3. *Sciurus Petaurista*, Taquan, or Taguan flying
Squirrel, Sailing Squirrel (Penn.)
4. *Sciurus getulus*, Barbary Squirrel
5. *Sciurus vulgaris*, Common Squirrel

PLATE

GENUS MYOXUS.

26. Fig. 6. *Myoxos Muscardinus* (Schreb.), *Mus avellanarius* (Linn.) Common Dormouse.—
(Donov. Brit. Quadr.)

GENUS DIPUS.

27. Lettered QUADRUPEDS, Order Glires, Genus Dipus
(No number on the Plate)

- Fig. 1. *Dipus Jaculus*, Common Jerboa (or Gerboa)
2. *Dipus Sagitta*, Arabian Jerboa
3. *Dipus cafer*, Cape Jerboa

GENUS LEPUS.

- Fig. 4. *Lepus timidus*, Common Hare
5. *Lepus alpinus*, (Pallas) Alpine Hare
(*Distinā* from the Alpine Hare of Forster in *Phil. Transf.* vol. lxiii. and *Pennant Quadr.*, the latter being *Lepus variabilis*, Gmel. Donov. Brit. Quadr.)

GENUS HYRAX.

- Fig. 6. *Hyrax Capensis*, Cape Hyrax

ORDER PECORA.

GENUS CAMELUS.

28. Lettered QUADRUPEDS, Order Pecora, Genus Camelus
(No number on the Plate)

- Fig. 1. *Camelus Dromedarius*, Arabian Camel or Dromedary
2. *Camelus Bactrianus*, Bactrian Camel

GENUS MOSCHUS.

29. Lettered QUADRUPEDS, Genus Moschus
(No order or number on the Plate)

- Fig. 1. *Moschus moschiferus*, Thibet Musk
2. *Moschus pygmaeus*, Guinea Musk
3. *Moschus javanicus*, Java Musk

GENUS CERVUS.

4. *Cervus Alces*, Elk

30. Lettered QUADRUPEDS, Genus Cervus
(No order or number on the Plate)

- Fig. 1. *Cervus Tarandus*, Rein Deer
2. *Cervus Elaphus*, Stag or Hart
3. *Cervus Axis*, Spotted Axis

GENUS CAMELOPARDALIS.

4. *Camelopardalis Giraffa*, Giraff, or Camelopard

GENUS ANTILOPE.

31. Lettered QUADRUPEDS, Genus Antelope
(No order or number on the Plate)

- Fig. 1. *Antilope Rupicapra*, Chamois
2. *Antilope Cervicapra*, Antelope
3. *Antilope pygmaea*, Royal Antelope, or Pigmy Antelope
4. *Antilope Grimmia*, Guinea Antelope
5. *Antilope Gnu*, Gnu

PLATE

GENUS CAPRA.

32. Lettered QUADRUPEDS, Genus Capra
(No order or number on the Plate)

- Fig. 1. *Capra Ibx*, Ibx Goat
2. *Capra Ægagrus*, Mountain-cultivated Goat
(Donov. Brit. Quadr.)
3. 4. *Capra Ægagrus*, Domesticated Goat
(Donov. Brit. Quadr.)
5. *Capra Ægagrus*, (var. *membricada*) Syrian Goat
6. *Capra Ægagrus*, (var. *angorensis* γ) Angora Goat

GENUS ARIES.

33. Lettered QUADRUPEDS, Ovis, Aries
(No order or number on the Plate)

Aries, Ovis, Common Sheep
var. South Down Polled Sheep of the improved breeds. From the Stock of the late Duke of Bedford, Woburn

34. Lettered QUADRUPEDS, Genus Ovis, Sheep
(No order or number on the Plate)

- Aries, Ovis*, Common Sheep
Fig. 1. var. Norfolk Breed
2. Hereford Breed

GENUS BOS.

35. Lettered QUADRUPEDS, Bos, Taurus
(No order or number on the Plate)

- Bos, Taurus*, Ox
Fig. 1. var. Scottish Wild Ox, the Bull
2. The Cow and Calf

36. Lettered QUADRUPEDS, Bos, Taurus
(No order or number on the Plate)

Bos, Taurus, Common Ox
var. Long-horned or Lancashire Breed

ORDER BELLUE.

GENUS EQUUS.

37. Lettered HORSES, Plate I.
(No order on the Plate)

- Equus Caballus*, Horfe
Fig. 1. var. Shetland Poney
2. var. English Cart Horfe

38. Lettered QUADRUPEDS, Order VI. Belluæ, Genus 33,
Equus
(No number on the Plate)

Equus Caballus, Horfe
var. Suffolk Agricultural Punch Horfe
var. Suffolk Mare and Foal, from the Stock of the late Duke of Bedford

39. Lettered QUADRUPEDS, Genus Equus
(No order or number on the Plate)

- Equus Caballus*, Horfe
Fig. 1. var. Race Horfe, Royalist
2. var. The Hunter Skylark

GENUS HIPPOPOTAMUS.

40. Lettered QUADRUPEDS, Genus Hippopotamus
(No number on the Plate)

Fig. 1. *Hippopotamus amphibius*, Hippopotamus

GENUS TAPIR.

Fig. 2. *Tapir Americanus*, Tapir

GENUS SUS.

41. Lettered QUADRUPEDS, Genus Sus
(No number on the Plate)

Fig. 1. *Sus Scrofa*, (*ferus* α) Wild Hog
2. *Sus Babyrousa*, Babyrousa
3. *Sus Æthiopicus*, Æthiopian Hog
4, 5. *Sus Scrofa*, (*domesticus* β) Domesticated Hog

ORDER CETE.

GENUS MONODON.

42. Lettered MAMMALIA, Order Cete, Genus Monodon,
&c.

(No number on the Plate)

Fig. 1. *Monodon Monoceros*, Narwhal, or Narval
(Sometimes Sea Unicorn, or One-toothed Monodon,
so rarely having two teeth, that only a single example
of the kind is known. *Donov. Mus. Vide Donov.
Brit. Quadrupeds*)

GENUS BALENA.

Fig. 2. *Balena Mystecetes*, Great Mystecete, or
Common Whale
3. *Balena Boops*, Pike-headed Whale

GENUS PHYSETER.

43. Lettered MAMMALIA, Order Cete, Genus Physter
(No number on the Plate)

Fig. 1. *Physter macrocephalus*, Blunt-headed Ca-
chalot
2. *Physter*, var. *gibbosus*, (Schreb.) Gibbosus
Cachalot

GENUS DELPHINUS.

Fig. 3. *Delphinus Phocæna*, Porpoise
4. *Delphinus Delphis*, Dolphin

ORNITHOLOGY.

CLASS II. AVES.

ORDER ACCIPITRES.

GENUS VULTUR.

44. Lettered Division I. LAND BIRDS, Plate II.

Fig. 1. *Vultur Gryphus*, Megallanic Condur, or
Condor

GENUS FALCO.

2. *Falco Chrysaetos*, Golden Eagle
3. *Falco gentilis*, Falcon Gentil
4. *Falco subbuteo*, Hobby

GENUS STRIX.

44. 5. *Strix Bubo*, Great Horned Owl, or Eagle
Owl
6. *Strix flammea*, Common Owl

ORDER PICÆ.

GENUS PSITTACUS.

45. Lettered Division I. LAND BIRDS, Plate I. Order
Picæ

Fig. 1. *Psittacus Macao*, Red and blue Maccaw
2. *Psittacus Alexandri*, Alexandrine Parrot
3. *Psittacus Æthiopus*, var. Amazon Parrot
4. *Psittacus garrulus*, var. Ceram Lory
5. *Psittacus Moluccensis*, Great red-crested
Cockatoo
6. *Psittacus Banksii*, Banksian Cockatoo
7. *Psittacus pullarius*, Ethiopian Parrot

GENUS RAMPHASTOS.

46. Lettered Division I. LAND BIRDS, Plate II. Picæ

Fig. 1. *Ramphastos pifscivorus*, Brazilian Toucan
2. *Ramphastos Aracari*, Green Toucan, or
Aracari

GENUS BUCEROS.

Fig. 3. *Buceros Rhinoceros*, Rhinoceros Horn-bill

GENUS BUPHAGA.

Fig. 4. *Buphaga Africana*, African Beef-eater

GENUS CROTOPHAGA.

Fig. 5. *Crotophaga Ani*, (*major*) greater Ani Bird

GENUS GLAUCOPIS.

Fig. 6. *Glaucopis cinereus*, Cinereous Wattle Bird

GENUS CORVUS.

47. Lettered Division I. LAND BIRDS, Picæ, Plate III.

Fig. 1. *Corvus Corax*, Raven
2. *Corvus Pica*, Magpie
3. *Corvus Caryocatactes*, Nut-cracker
4. *Corvus glandarius*, Jay
5. *Corvus cristatus*, Crested Jay

GENUS CORACIAS.

Fig. 6. *Coracias Garrulus*, Roller, (Garrulous Roller,
Donov. Brit. Birds)

GENUS ORIOIUS.

48. Lettered Division I. LAND BIRDS, Order II. Picæ,
Plate IV.

Fig. 1. *Oriolus cristatus*, Crested Oriole
2. *Oriolus Baltimoreus*, Baltimore Oriole
3. *Oriolus Perficus*, Black and Yellow Oriole
4. Nest of ditto

GENUS CUCULUS.

Fig. 5. *Cuculus canorus*, Common Cuckow

PLATE

48. Fig. 6. *Cuculus cupreus*, Coppery Cuckoo
7. *Cuculus indicator*, Honey-guide

GENUS GRACULA.

49. Lettered Division I. LAND BIRDS, Order II. PICÆ,
Plate V.

- Fig. 1. *Gracula Quiscalia*, Purple Grackle
2. *Gracula calva*, Bald Grackle
3. *Gracula Saularis*, Dial Grackle

GENUS PARADISEA.

- Fig. 4. *Paradisea Regia*, King Bird of Paradise
5. *Paradisea Apoda*, Greater Bird of Paradise
6. *Paradisea aurea*, Golden Bird of Paradise

GENUS TODUS.

- Fig. 7. *Todus macrorhynchus*, Great-billed Tody
(This genus should be placed after *Sitta*.)

GENUS TROGON.

50. Lettered Division I. LAND BIRDS, Order II. PICÆ,
Plate VI.

- Fig. 1. *Trogon Curucui*, Red-bellied Trogon

GENUS BUCCO.

- Fig. 2. *Bucco Lathamii*, Buff-faced Barbet
3. *Bucco Cayanensis*, Cayenne Barbet

GENUS YUNX.

- Fig. 4. *Yunx Torquilla*, Wryneck

GENUS PICUS.

- Fig. 5. *Picus pileatus*, Pileated Woodpecker
6. *Picus Carolinus*, var. Caroline Woodpecker

GENUS SITTA.

- Fig. 7. *Sitta Europea*, European Nuthatch

GENUS ALCEDO.

51. Lettered Division I. LAND BIRDS, Order II. PICÆ,
Plate VII.

- Fig. 1. *Alcedo cristata*, Crested King's Fisher
2. *Alcedo venerata*, Venerated King's Fisher
3. *Alcedo Aleyon*, Belted King's Fisher
4. *Alcedo sacra*, Sacred King's Fisher

GENUS GALBULA.

- Fig. 5. *Galbula paradisea*, Lath. (*Alcedo paradisea*,
Gmel.) Long-tailed Jacamar, Paradise Jacamar
6. *Galbula viridis*, Lath. (*Alcedo Galbula*,
Gmel.) Green Jacamar

GENUS MEROPS.

52. Lettered Division I. LAND BIRDS, Order II. PICÆ

- Fig. 1. *Merops carunculatus*, Wattled Bee-eater
2. *Merops Novæ Seelandiæ*, New Zealand
Bee-eater

GENUS UPUPA.

- Fig. 3. *Upupa Pomerops*, Cape Hoopoe

PLATE

52. Fig. 4. *Upupa Epops*, Common Hoopoe
5. *Upupa Erythrorhynchus*, Red-billed Hoopoe

GENUS CERTHIA.

53. Lettered Division I. LAND BIRDS, Order PICÆ,
Plate IX.

- Fig. 1. *Certhia pacifica*, Great hooked-billed Creeper
2. *Certhia obscura*, Hook-billed Green Creeper
3. *Certhia coccinea*, Hook-billed Red Creeper
4. *Certhia caerulea*, Blue Creeper

GENUS TROCHILUS.

- Fig. 5. *Trochilus pelta*, Topaz Humming Bird
6. *Trochilus furcatus*, Laffer-forked Humming
Bird
7. *Trochilus puniceus*, Crested Humming Bird
8. *Trochilus ornatus*, Tufted-necked Humming
Bird
9. *Trochilus minimus*, Least Humming Bird

ORDER ANSERES.

GENUS ANAS.

54. Lettered Division II. WATER BIRDS, Order III.
Anseres, Plate I.

- Fig. 1. *Anas atrata*, Black Swan
2. *Anas Olor*, Tame Swan
3. *Anas cygnoides*, Chinese Goofe
4. *Anas gambensis*, Spur-winged Goofe

55. Lettered Division II. WATER BIRDS, Order III.
Anseres, Plate II.

- Fig. 1. *Anas erythropterus*, Bernacle Goofe
2. *Anas Canadensis*, Canada Goofe
3. *Anas speñabilis*, Grey-headed Duck
4. *Anas Moschata*, Mufcovy Duck

56. Lettered Division II. WATER BIRDS, Order III.
Anseres, Plate V.

- Fig. 1. *Anas tardonæ*, Sheldrake, or Shieldrake
2. *Anas clypeata*, Shoveler
3. *Anas crecca*, Teal
4. *Anas curvirostra*, Hooked-billed Duck,
(var. *Donov. Brit. Birds*)
5. *Anas Boschas*, Mallard
6. *Anas Galericulata*, Mandarin Drake

GENUS MERGUS.

57. Lettered Division II. WATER BIRDS, Order III.
Anseres, Plate IV.

- Fig. 1. *Mergus Merganser*, Gooferander
2. *Mergus cucullatus*, Crested Merganser
3. *Mergus albellus*, Smew, or Nun
(White Smew, *Donov. Brit. Birds*)

GENUS ALCA.

- Fig. 4. *Alca antiqua*, Ancient Auk
5. *Alca cirrata*, Tufted Auk

GENUS APTENODYTA.

- Fig. 6. *Aptenodyta patachonica*, Patagonian Penguin

NATURAL HISTORY.

PLATE

57. Fig. 7. *Aptenodyta papua*, Papuan Penguin
8. *Aptenodyta minor*, Little Penguin

GENUS PROCELLARIA.

58. Lettered Division II. WATER BIRDS, Order III. Anferes, Plate VI. *Obf.* with six Birds.

- Fig. 1. *Procellaria capensis*, Pintado Petrel
2. *Procellaria fuliginosa*, Sooty Petrel
3. *Procellaria pelagica*, Stormy Petrel
4. *Procellaria gigantea*, Gigantic Petrel

GENUS DIOMEDIA.

- Fig. 5. *Diomedea spadicea*, Chocolate Albatrofs
6. *Diomedea chlororhynchus*, Yellow-nofed Albatrofs

GENUS PELECANUS.

59. Lettered Division II. WATER BIRDS, Order III. Anferes, Plate VI. *Obf.* This is the Plate VI. containing five Birds, both being lettered and numbered alike

- Fig. 1. *Pelecanus Erythrorhynchus*, Rough-billed Pelican
2. *Pelecanus Sula*, Booby
3. *Pelecanus Aquilus*, Frigate

GENUS PLOTUS.

- Fig. 4. *Plotus punctatus*, Spotted Shag
5. *Plotus melanogaster*, Black-bellied Darter

GENUS PHÆTON.

60. Lettered Division II. WATER BIRDS, Order III. Anferes, Plate VII.

- Fig. 1. *Phæton athereus*, Common Tropic Bird
2. *Phæton phœnicurus*, Red-tailed T. B.

GENUS COLYMBUS.

- Fig. 3. *Colymbus marmoratus*, Marbled Guillemot
4. *Colymbus arcticus*, Black-throated Diver
5. *Colymbus sinensis*, Chinese Diver
6. *Colymbus cornutus*, Horned Grebe

GENUS LARUS.

61. Lettered Division II. WATER BIRDS, Order Anferes, Plate IX.

- Fig. 1. *Larus parasiticus*, Arctic Gull
2. *Larus eburneus*, Ivory Gull
3. *Larus marinus*, Black-backed Gull

GENUS STERNA.

- Fig. 4. *Sterna caspia*, (*Sterna Tschegrawa*, Lepechin) Caspian Tern
5. *Sterna flosida*, Noddy

GENUS RYNCHOPS.

- Fig. 6. *Rynchops nigra*, Black Skimmer

ORDER GRALLÆ.

GENUS PHENICOPTERUS.

62. Lettered Order Grallæ, Plate I.
Fig. 1. *Phenicopterus ruber*, Red Flamingo

PLATE

GENUS PLATALEA.

62. Fig. 2. *Platalea ajaja*, Roseate Spoonbill

GENUS PALAMEDEA.

- Fig. 3. *Palamedea cornuta*, Horned Screamer

GENUS MYCTERIA.

- Fig. 4. *Mycteria Nova Hollandia*, New Holland Jabiru

GENUS CANCROMA.

63. Lettered Order Grallæ, Plate II.

- Fig. 1. *Canceroma Cochlearia*, Crested Boatbill

GENUS SCOPUS.

- Fig. 2. *Scopus Umbretta*, Tufted Umbre

GENUS ARDEA.

- Fig. 3. *Ardea Pavonina*, Crowned Crane
4. *Ardea Antigone*, Indian Crane

64. Lettered Order Grallæ, Plate III.

- Fig. 1. *Ardea Ciconia*, White Stork
2. *Ardea Dubia*, Gigantic Heron
3. *Ardea exilis*, Minute Bittern
4. *Ardea Egretta*, Great Egret
5. *Ardea Tigrina*, Tiger Bittern

GENUS TANTALUS.

65. Lettered Order Grallæ, Plate IV.

- Fig. 1. *Tantalus Loculator*, Wood Ibis
2. *Tantalus melanoptis*, Black-faced Ibis
3. *Tantalus calvus*, Bald Ibis

GENUS CORRIRA.

- Fig. 4. *Corrira italica*, Italian Courier

GENUS SCOLOPAX.

- Fig. 5. *Scolopax leucocephala*, White Headed Curlew
6. *Scolopax phæpus*, Whimbrel

66. Lettered Order Grallæ, Plate V.

- Fig. 1. *Scolopax lapponica*, Red or Lapland Godwit
2. *Scolopax candida*, White red Shank
3. *Scolopax capensis*, Cape Snipe
4. *Scolopax ruficollis*, Wood Cock
5. *Scolopax major*, Great Snipe
6. *Scolopax fedoa*, Great or American Godwit
7. *Scolopax limosa*, Lesser Godwit

GENUS TRINGA.

67. Lettered Order Grallæ, Plate V.

- Fig. 1. *Tringa leucoptera*, White-winged Sandpiper
2. *Tringa pugnax*, Ruff and Reeve
4. *Tringa lobata*, Grey Phalarope

GENUS CHARADRIUS.

- Fig. 5. *Charadrius apricarius*, Alwagrim
6. *Charadrius Himantopus*, Long-legged Plover
7. *Charadrius spinosus*, Spur-winged Plover

NATURAL HISTORY.

PLATE

GENUS RECURVIROSTRA.

68. Lettered Order Grallæ, Plate VII.
Fig. 1. *Recurvirostra americana*, American Avocet

GENUS HÆMATOPUS.

- Fig. 2. *Hæmatopus ostralegus*, Oyster catcher (Pied Oyster Catcher, *Donov. Brit. Birds.*)

GENUS GLAREOLA.

- Fig. 3. *Glareola austriaca*, Austrian Pratincole

GENUS FULICA.

- Fig. 4. *Fulica Porphyrio*, Purple Gallinule
5. *Fulica cristata*, Crested Coot

GENUS VAGINALIS.

69. Lettered Order Grallæ, Plate VIII.
Fig. 1. *Vaginalis alba*, White Sheath-bill

GENUS PARRA.

- Fig. 2. *Parra Jacana*, Chefnut Jacana
3. *Parra sinensis*, China Jacana

GENUS RALLUS.

- Fig. 4. *Rallus crex*, Land Rail
5. *Rallus variegatus*, Variegated Rail

GENUS PSOPHIA.

- Fig. 6. *Psophia crepitans*, Gold-breasted Trumpeter

ORDER GALLINÆ.

GENUS OTIS.

70. Lettered Division I. LAND BIRDS, Order 5. Gallinæ, Plate I.
Fig. 1, 2. *Otis Tarda*, Bustard—male 1. female 2.

GENUS STRUTHIO.

- Fig. 3. *Struthio Rhea*, American Ostrich
4. *Struthio casuarius*, Calfowary, or Emeu
5. *Struthio Novæ-Hollandiæ*, New Holland Calfowary

GENUS DIDUS.

71. Lettered Division II. LAND BIRDS, Order 5. Gallinæ.
Fig. 1. *Didus Ineptus*, Hooded Dodo

GENUS STRUTHIO.

- Fig. 2, 3. *Struthio Camelus*, Ostrich—male 2. female 3.

GENUS PAVO.

72. Lettered Division I. LAND BIRDS, Order Gallinæ, Plate III.
Fig. 1. *Pavo cristatus*, Crested Peacock
2. *Pavo cristatus* (var. *varius*), Variegated or Pied Peacock
3. *Pavo cristatus* (var. *albus*), White Peacock
4. *Pavo bicalcaratus*, Iris peacock

PLATE

GENUS MELEAGRIS.

73. Lettered Division II. LAND BIRDS, Order 5. Gallinæ, Plate IV.
Fig. 1. *Meleagris Gallopavo*, American or Wild Turkey

GENUS PENELOPE.

- Fig. 2. *Penelope cristata*, Guan

GENUS CRAX.

- Fig. 3, 4. *Crax Aleator*, Curaffow—male 3. female 4.
5. *Crax Pausi*, Cufew

GENUS PHASIANUS.

74. Lettered Division II. LAND BIRDS, Order Gallinæ, Plate V.
Fig. 1, 2. *Phasianus Gallus*, Wild Cock—male 1. female 2.
3. Ditto, var. *domesticus*, domesticated varieties, Rumples Cock
4. Ditto, Silky Cock
5, 6. Hamburg Cock—male 5. female 6.
7, 8. Game Cock—male 7. female 8.
9, 10. *puffinus* ♂, Bantam Cock—male 9. female 10.

75. Lettered Division II. LAND BIRDS, Order Gallinæ, Plate VI.

- Fig. 11, 12. *Phasianus Gallus*, var. *domesticus*, varieties, Malay Cock—male 11. female 12.
13, 14. Ditto, Dorking Cock—male 13. female 14.
15, 16. Ditto, Frizzled Cock—male 15. female 16.

76. Lettered Division III. LAND BIRDS, Order Gallinæ, Plate VII.

- Fig. 1. *Phasianus Colchicus*, Common Pheasant
2. *Phasianus pitaus*, Gold Pheasant
3. *Phasianus Nycthemerus*, Silver Pheasant
4. *Phasianus Argus*, Argus Pheasant

GENUS NUMIDIA.

77. Lettered Division I. LAND BIRDS, Order Gallinæ, Plate VIII.
Fig. 1. *Numidia meleagris*, Guinea Hen or Pintado
2. *Numidia cristata*, Crested Pintado

GENUS TETRAO.

- Fig. 3. *Tetrao umbellus*, Ruffed or Ruff-necked Grouse
4. *Tetrao alchata*, Pin-tailed Grouse
5. *Tetrao Canadensis*, Spotted Grouse
6. *Tetrao paradoxus*, Heteroclitus Grouse, or Paradoxical Grouse

78. Lettered Division II. LAND BIRDS, Order Gallinæ, Plate IX.

- Fig. 1. *Tetrao perdix*, Common Partridge
2. *Tetra ferrugineus*, Hackled Partridge

PLATE

78. Fig. 3. *Tetrao gibraltarius*, Gibraltar three-toed Quail
 4. *Tetrao marylandus*, Maryland Quail
 5. *Tetrao viridis*, Green Quail—male
 6. *Tetrao major*, Great Tinamou
 7. *Tetrao variegatus*, Variegated Tinamou

ORDER PASSERES.

GENUS COLUMBA.

79. Lettered Division I. LAND BIRDS, Order Passeres, Plate II.
 Fig. 1. *Columba chalcoptera*, Bronze-winged Pigeon
 2. *Columba erythroptera*, Garnet-winged Pigeon
 3. *Columba macroura*, Great-tailed Pigeon
 4. *Columba nicobarica*, Nicobar Pigeon
 5. *Columba curvirostra*, Hook-billed Pigeon
 6. *Columba capensis*, Cape Turtle, or Cape Pigeon
 7. *Columba coronata*, Great-crowned Pigeon

GENUS ALAUDA.

80. Lettered Division I. LAND BIRDS, Order Passeres, Plate LXXX.
 Fig. 1. *Alauda capensis*, Cape Lark

GENUS STURNUS.

- Fig. 2. *Sturnus militaris*, Military Starling
 3. *Sturnus undata*, Undulated Starling

81. Lettered Division I. LAND BIRDS, Order Passeres, Plate III.

- Fig. 1. *Turdus Orpheus*, Mocking Thrush
 2. *Turdus Rex*, King Thrush
 3. *Turdus perspicillatus*, Spécacle Thrush
 4. *Turdus crassirostris*, Thick-billed Thrush
 5. *Turdus cyanurus*, Blue-tailed Thrush
 6. *Turdus longirostris*, Long-billed Thrush

GENUS AMPELIS.

82. Lettered Division I. LAND BIRDS, Order Passeres, Plate IV.

- Fig. 1. *Ampelis carunculata*, Carunculated Chatterer
 2. *Ampelis cotinga*, Purple-breasted Chatterer
 3. *Ampelis Pompadora*, Pompadour Chatterer
 4. *Ampelis carnifex*, Red Chatterer

GENUS COLIUS.

- Fig. 5. *Colius capensis*, Cape Coly
 6. *Colius erythropus*, White-backed Coly

GENUS LOXIA.

83. Lettered Division I. LAND BIRDS, Order Passeres, Plate V.

- Fig. 1. *Loxia lineola*, Lineated Grosbeak
 2. *Loxia cucullata*, Crested Dominican Grosbeak
 3. *Loxia philippina*, Philippine Grosbeak
 4. The pendulous Nest of the Philippine Grosbeak
 5. *Loxia Cardinalis*, Cardinal Grosbeak
 6. *Loxia afrilld*, Waxen-billed Grosbeak
 7. *Loxia flabellifera*, Fan-tailed Grosbeak

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PLATE

GENUS EMBERIZA.

84. Lettered Division I. LAND BIRDS, Order Passeres, Plate VI.

- Fig. 1. *Emberiza Paradisca*, Whidah Bird
 2. *Emberiza ciris*, Painted Bunting
 3. *Emberiza Regia*, Shaft-tailed Bunting
 4. *Emberiza provincialis*, Multachoe Bunting
 5. *Emberiza americana*, Black-throated Bunting
 6. *Emberiza hortulana*, Oortolan Bunting

GENUS TANAGRA.

85. Lettered Division I. LAND BIRDS, Order 3, Passeres, Plate X.

- Fig. 1. *Tanagra Tataa*, Paradise Tanager
 2. *Tanagra capitalis*, Capital Tanager
 3. *Tanagra Jacapa*, Red-breasted Tanager

GENUS FRINGILLA.

- Fig. 4. *Fringilla ignita*, Fire Finch
 5. *Fringilla flammea*, Crimson-crowned Finch
 6. *Fringilla bengalica*, Blue-bellied Finch
 7. *Fringilla Pfitacus*, Parrot Finch

GENUS PHYTOTOMA.

- Fig. 8. *Phytotoma rara* (*Molina, Hist. Nat. Chili*)
 Chili Phytotoma

GENUS MUSCICAPA.

86. Lettered Order Passeres, Plate VIII.

- Fig. 1. *Muscicapa bicolor*, Black and White Flycatcher
 2. *Muscicapa barbata*, Whiskered Flycatcher
 3. *Muscicapa tyrannus*, Forked-tailed Flycatcher
 4. *Muscicapa malachura*, Soft-tailed Flycatcher
 5. *Muscicapa flabellifera*, Fan-tailed Flycatcher

GENUS MOTACILLA.

- Fig. 6. *Motacilla cyanea*, Superb Wheat-ear
 7. *Motacilla Madraspatensis*, Pied Wagtail
 (Madras Pied Wagtail)

GENUS MOTACILLA.

87. Lettered Order Passeres, Plate IX.

- Fig. 1. *Motacilla pileata*, Black-headed Warbler
 2. *Motacilla spinicauda*, Thorn-tailed Warbler
 3. *Motacilla succica*, Blue-throated Warbler

GENUS PIPRA.

- Fig. 4. *Pipra rupicola*, Rock Manakin
 5. *Pipra striata*, Striped-headed Manakin
 6. *Pipra leucocephala*, White-capped Manakin
 7. *Pipra punctata*, Speckled Manakin

GENUS PARUS.

88. Lettered Order Passeres, Plate XX.

- Fig. 1. *Parus macrocephalus*, Great-headed Titmouse
 2. *Parus cristatus*, Crested Titmouse

GENUS HIRUNDO.

88. Fig. 4. *Hirundo efculenta*, Efculent Swallow
 5. The efculent Nelt of this Swallow
 6. *Hirundo tabitica*, Otaheite Swallow
 7. *Hirundo pelafgia*, Aculeated Swallow
 3. *Hirundo indica*, Rufous-headed Swallow

GENUS CAPRIMULGUS.

80. Lettered Division LAND BIRDS, Order Pafferes,
 Plate LXXX.
 Fig. 4. *Caprimulgus longipennis*, Leona Goatfucker
 5. *Caprimulgus grandis*, Great Goatfucker

ELEMENTARY PLATES

TO ILLUSTRATE

THE CLASSIFICATION OF BIRDS.

Characters of the Feet in the different Orders and Genera.

ACCIPITRES.

Feet formed for affifting the Mandibles in feizing and tearing the prey, being armed with ftrong talons.

89. Lettered ORNITHOLOGY, Elementary Plate I.
 The Feet in *Falco* (*Falco Chryfator*, Golden Eagle); and Eagles, Falcons, Hawks;
 The Feet in *Strix* (*Strix flammea*, White Owl); *Stridula*, *brachyotos*, *pallarina*
 (*The Shrikes belong to this order*)

PICÆ.

* *Feet formed for Perching.*

90. Lettered Plate IV.
 The Feet in *Sitta* (Nuthatch) European Nuthatch
 92. Lettered Plate II.
 The feet in *Corvus* (Crow) Common Crow
Paradifea (Bird of Paradife)
 The fame ftructure prevails in the feet of the genera *Buphaga*, *Oriolus*, *Coracias*, *Upupa*, *Certhia*, *Trochilus*, &c.

** *Feet formed for Climbing.*

90. Lettered Elementary Plate IV.
 The Feet of *Picus* (*P. Martius*, Great Black Woodpecker; *P. Viridis*, Green Woodpecker).
 The Feet of *Mufophagus* (Mufophage)
 This ftructure is well exemplified in *Pfittacus* (Parrot), and *Cuculus* (Cuckow), which are familiar examples; and occurs in the genera *Scythrops*, *Ramphafios*, *Trogon*, *Crotophaga*, *Galbula*, *Yunx*, and *Bucco*.

*** *Feet formed for Walking.*

90. Lettered Elementary Plate IV.
 The Foot of *Alcedo* (King's-fifher)
 The other genera of *Picæ*, which have the feet formed for walking, are *Momotus*, *Buceros*, *Merops*, and *Todus*.

ANSERES.

Feet formed for Swimming.

91. Lettered ORNITHOLOGY, Elementary Plate III.
 Feet in the genus *Anas* (Goofe, Duck)
Alca (Auk)
Aptenodyta (Penguin)
Pelecanus (Pelican), two fpecies
Colymbus (Grebe), three fpecies
Larus (Gull)
 90. Lettered ORNITHOLOGY, Elementary Plate IV.
 Feet in the genus *Sterna* (Tern)

GRALLÆ.

Feet formed for Wading.

91. Lettered ORNITHOLOGY, Elementary Plate III.
 Feet in the genus *Phanicopterus* (Flamingo)
 89. Lettered ORNITHOLOGY, Elementary Plate I.
 Feet in the genus *Platalea* (Spoonbill) *P. ajaja*
 90 & 92. } Lettered ORNITHOLOGY, Elementary Plate IV.
 } and II.
 Feet in the genus *Ardea* (Heron)
 89. Lettered ORNITHOLOGY, Elementary Plate I.
 Feet in the genus *Ardea cinerea* (Grey Heron)
 91. Lettered ORNITHOLOGY, Elementary Plate III.
 Feet in the genus *Recurviroftra*, (Avocet)
 89. Lettered ORNITHOLOGY, Elementary Plate I.
 Feet in the genus *Tantalus* (Ibis) *T. igneus*, Bay Ibis
 91. Lettered ORNITHOLOGY, Elementary Plate III.
 Feet in the genus *Tringa* (Phalarope) *T. lobata*, Scallop-toed *Tringa*
 89. Lettered ORNITHOLOGY, Elementary Plate I.
 Feet in the genus *Charadrius* (Plover, Long-legged P.)
Hematopus (Oyfter Catcher)
Glareola (Pratincole) *P. austruca*
 91. Lettered ORNITHOLOGY, Elementary Plate III.
 Feet in the genus *Fulica* (Gallinule)
Vigialis (Sheathbill)
 90. Lettered ORNITHOLOGY, Elementary Plate IV.
 Feet in the genus *Rallus* (Rail)

PLATE

91. Lettered ORNITHOLOGY, Elementary Plate III.
Feet in the genus *Rallus* (*Rallus gallinule*)

90. Lettered ORNITHOLOGY, Elementary Plate IV.
Feet in the genus *Parra* (*Jacana*), two species

GALLINÆ.

Form of the Feet.

92. Lettered ORNITHOLOGY, Elementary Plate II.

In the genus *Otis* (Bustard)
Struthio (Ostrich) *S. camelus*, Common
or Black Ostrich
Struthio cajuarius, Caffowary
Cereopsis (Cereops)
Pavo (Peacock) Common P.
Phasianus (Pheasant) Common P.
Menura (*Menura*)

89. Lettered ORNITHOLOGY, Elementary Plate I.

In the genus *Tetrao* (Grouse), *T. Urogallus*, Great
Grouse. *T. lagopus*, Ptarmigan. *T. tetrix*, Black
Game

PASSERES.

Structure of the Feet.

89. Lettered ORNITHOLOGY, Elementary Plate I.

In the genus *Colius* (*Coly*)

90. Lettered ORNITHOLOGY, Elementary Plate IV.

In the genus *Alauda* (Lark), *A. arvensis*, Sky-
lark. *A. obscura*, Dullky Lark
Pipra (*Manakin*)

92. Lettered ORNITHOLOGY, Elementary Plate II.

In the genus *Parus* (*Titmoufe*)

90. Lettered ORNITHOLOGY, Elementary, Plate IV.

In the genus *Turdus* (*Thrush*)
Motacilla (*Warbler*)

89. Lettered ORNITHOLOGY, Elementary Plate I.

In the genus *M. Regulus* (*Gold-crested Wren*)

CLASS AMPHIBIA.

ORDER I. REPTILES.

GENUS TESTUDO.

Marine Turtles.

93. Lettered AMPHIBIA, Plate X.

Fig. 5. *Testudo mydas*, Efulcent Green Turtle
6. *Testudo imbricata*, Hawkbill Turtle

Land Tortoises.

Fig. 1. *Testudo denticulata*, Denticulated Tortoise
2. *Testudo europæa*, Green Speckled Tortoise
3. *Testudo guttata*, Spotted Tortoise
4. *Testudo picta*, Painted Tortoise

PLATE

GENUS RANA.

94. Lettered AMPHIBIA, Plate I.

Fig. 1. *Rana Pipa*, Surinam Toad—*Female with her
young nestling in cellules on the back*
2. *Rana bicolor*, Two-coloured Frog
3. *Rana paradoxo*, Paradoxical Frog, in the
fifth-like former tad-pole state
4. *Rana arborea*, Tree Frog.

GENUS LACERTA.

95. Lettered AMPHIBIA, Plate VIII.

Fig. 1. *Lacerta Salamandra*, Salamander
2. *Lacerta Vittata*, Forked Lizard
3. *Lacerta Chamaeleon*, Chameleon
4. *Lacerta agilis*, Green Lizard
5. *Lacerta lemniscata*, Eight-lined Lizard

96. Lettered AMPHIBIA, G. Lacerta, Plate IX.

Fig. 1. *Lacerta scincoides*, Australasian Galliwasp
2. *Lacerta chalcides*, Chalcides Lizard
3. *Lacerta apus*, Apodal Lizard

GENUS DRACO.

Fig. 4. *Draco volans*, Flying Dragon, (*Lacerta vo-
lans*, Flying lizard)

GENUS SIREN.

97. Lettered AMPHIBIA, G. Siren, Plate VI.

Fig. 1. *Siren lacertina*, Eel-shaped Siren
2. *Siren anguina*, Anguine Siren

ORDER II. SERPENTS.

GENUS CROTALUS.

98. Lettered AMPHIBIA, G. Crotalus, Plate II.

Fig. 1. *Crotalus horridus*, Banded Rattle-snake
2. *Crotalus Duriffus*, Striped Rattle-snake

GENUS BOA.

99. Lettered AMPHIBIA, G. Boa, Plate V.

Fig. 1. *Boa constrictor*, Great Boa Serpent
2. *Boa Phrygia*, Embroidered Boa Serpent
3. *Boa hortulana*, Garden Boa Serpent

GENUS COLUBER.

100. Lettered AMPHIBIA, G. Coluber, Plate IV.

Fig. 1. *Coluber nasicornis*, Horn-nosed Viper
2. *Coluber cerastes*, Cerastes Viper
3. *Coluber naja*, Nagoo or Spectacle Viper

GENUS ANGUIS.

101. Lettered AMPHIBIA, G. Anguis, Plate III.

Fig. 1. *Anguis Corallinus*, Coral Slow Worm
2. *Anguis ater*, Black Banded Slow Worm
3. *Anguis Jamaicensis*, Jamaica Slow Worm

GENUS AMPHIBIÆNA.

102. Lettered AMPHIBIA, G. Amphibiæna, Plate VII.

Fig. 1. *Amphibiæna alba*, White Amphibiæna
2. *Amphibiæna fuliginosa*, Fuliginous Amphif-
bæna

NATURAL HISTORY.

PLATE

GENUS CÆCILIA.

102. Fig. 3. *Cæcilia tentacula*, Eel-shaped Cæcilia

GENUS HYDRUS.

103. Lettered AMPHIBIA, G. Hydrus
Fig. 1. *Hydrus colubrinus*, Colubrine Hydrus
2. *Hydrus bicolor*, Black-backed Hydrus

GENUS LANGAYA.

- Fig. 3. *Langaya nasuta*, Snouted Langaya

GENUS ACROCHORDUS.

- Fig. 4. *Acrochordus dubius*, Doubtful Acrochordus

ICHTHYOLOGY.

CLASS PISCES.

ORDER APODES.

GENUS MURÆNA.

104. Lettered Order Apodes, Plate I.
Fig. 1. *Muræna anguilla*, Eel Muræna, or Common Eel

GENUS SYNBRANCHUS.

- Fig. 2. *Synbranchus marmoratus*, Marbled Synbranchus

GENUS SPHAGEBRANCHUS.

- Fig. 3. *Sphagebranchus rostratus*, Snouted Sphagebranchus

GENUS GYMNOTUS.

- Fig. 4. *Gymnotus electricus*, Electric Gymnotus

GENUS GYMNOTHORAX.

- Fig. 5. *Gymnotorax muræna*, Eel Gymnotorax
6. *Gymnotorax catenatus*, Chain Gymnotorax

GENUS STOMATEUS.

105. Lettered Order Apodes, Plate II.
Fig. 1. *Stomateus cinereus*, Ash-coloured Stomateus
2. *Stomateus niger*, Black Stomateus

GENUS STYLEPHORUS.

- Fig. 3. *Stylephorus chordatus*, Chordated Stylephorus

GENUS TRICHIURUS.

- Fig. 4. *Trichiurus argenteus*, Silvery Trichiurus

GENUS STERNOPTYX.

- Fig. 5. *Sternoptyx diaphana*, Diaphanous Sternoptyx

GENUS XIPHIAS.

- Fig. 6. *Xiphias gladius*, Sword-fish

GENUS ANARHICHAS.

- Fig. 7. *Anarhichas lupus*, Ravenous Wolf-fish

PLATE

ORDER JUGULARES.

GENUS TRACHINUS.

106. Lettered Order Jugulares, Plate I.
Fig. 1. *Trachinus major*, Great Weever
2. *Trachinus draco*, Small Weever

GENUS URANOSCOPIUS.

- Fig. 3. *Uranoscopus scaber*, Rough Stargazer

GENUS CALLIONYMUS.

- Fig. 4. *Callionymus dracunculus*, Sordid Dragonet
5. *Callionymus lyra*, Gemmous Dragonet

GENUS GADUS.

107. Lettered ICHTHYOLOGY, Order Jugulares, Plate II.
Fig. 1. *Gadus morhua*, Cod-fish
2. *Gadus carbonarius*, Coal-fish
3. *Gadus minutus*, Poor
4. *Gadus Tau*, Tau Cod-fish

GENUS BLENNIUS.

- Fig. 5. *Blennius maris*, Ocellated Blenny

GENUS KURTUS.

- Fig. 6. *Kurtus indicus*, Indian Kurtus

ORDER THORACICI.

GENUS CEPOLA.

108. Lettered ICHTHYOLOGY, Order Thoracici, Plate I.
Fig. 1. *Cepola Tenia*, Ribband-fish

GENUS ECHINEIS.

- Fig. 2. *Echineis Remora*, Mediterranean Sucking-fish

GENUS CORYPHÆNA.

- Fig. 4. *Coryphæna hippurus*, Common Coryphene
5. *Coryphæna pentadactyla*, Five-spotted Coryphene

GENUS GOBIUS.

- Fig. 3. *Gobius minutus*, Spotted Goby

GENUS COTTUS.

- Fig. 6. *Cottus grunniens*, Grunting Bull-head
7. *Cottus cataphraeus*, Mailed Bull-head

GENUS SCORPÆNA.

109. Lettered ICHTHYOLOGY, Order Thoracici, Plate II.
Fig. 1. *Scorpæna Scrofa*, Hog Sea-Scorpion
2. *Scorpæna horrida*, Horrid Sea-Scorpion
3. *Scorpæna antennata*, Antennated Sea-Scorpion

GENUS ZEUS.

- Fig. 4. *Zeus gallus*, American Zeus
5. *Zeus ciliaris*, Filamentous Zeus
6. *Zeus infidiator*, Infidious Zeus

NATURAL HISTORY.

PLATE

GENUS PLEURONECTES.

110. Lettered ICHTHYOLOGY, Order Thoracici, Plate III.

- Fig. 1. *Pleuronectes Zebra*, Zebra Sole
 2. *Pleuronectes Argus*, Argus Flounder
 3. *Pleuronectes plateffa*, Plaice
 4. *Pleuronectes bilineatus*, Bilineated Sole

111. Lettered ICHTHYOLOGY, Order Thoracici, Plate IV.

- Fig. 1. *Pleuronectes punctatus*, Dotted Flounder

GENUS CHÆTODON.

110. Lettered ICHTHYOLOGY, Order Thoracici, Plate III.

- Fig. 5. *Chætodon bicolor*, Two-coloured Chætodon
 6. *Chætodon fasciatus*, Banded Chætodon

111. Lettered ICHTHYOLOGY, Order Thoracici, Plate IV.

- Fig. 2. *Chætodon imperator*, Imperial Chætodon
 3. *Chætodon marginatus*, Bordered Chætodon
 4. *Chætodon arcuatus*, Bowed Chætodon
 5. *Chætodon rostratus*, Snouted Chætodon
 6. *Chætodon Teira*, Teira Chætodon

GENUS SPARUS.

112. Lettered ICHTHYOLOGY, Order Thoracici, Plate VII.

- Fig. 1. *Sparus falcatus*, Falcated Gilthead
 2. *Sparus Surinamensis*, Surinam Gilthead
 3. *Sparus fasciatus*, Banded Gilthead
 4. *Sparus chrysurus*, Golden-tailed Gilthead
 5. *Sparus annularis*, Annulated Gilthead
 6. *Sparus mana*, Cackarel

GENUS SCARUS.

113. Lettered ICHTHYOLOGY, Order Thoracici, Plate VIII.

- Fig. 7. *Scarus viridis*, Green Scarus

114. Lettered ICHTHYOLOGY, Order Thoracici, Plate X. & XI.

1. *Scarus crenensis*, Large-scaled Scarus

GENUS LABRUS.

113. Lettered ICHTHYOLOGY, Order Thoracici, Plate VIII.

- Fig. 1. *Labrus microlepidotus*, Large-scaled Wraffe
 2. *Labrus trichopterus*, Hair-finned Wraffe
 3. *Labrus malapterus*, Soft-finned Wraffe
 4. *Labrus maculatus*, Spotted Wraffe
 5. *Labrus punctatus*, Dotted Wraffe
 6. *Labrus melagaster*, Black-bellied Wraffe

GENUS SCIENA.

114. Lettered ICHTHYOLOGY, Order Thoracici, Plate X. & XI.

- Fig. 2. *Sciæna diacantha*, Two-spined Umber, or Sciæna
 3. *Sciæna cirrofa*, Cirrofe Sciæna
 4. *Sciæna punctata*, Dotted Sciæna
 5. *Sciæna plumiera*, Plumier's Sciæna

PLATE

116. Lettered ICHTHYOLOGY, Order Thoracici, Plate XI.

- Fig. 1. *Sciæna undecimalis*, Eleven-spot Sciæna
 2. *Sciæna lineata*, Lineated Sciæna

GENUS PERCA.

115. Lettered ICHTHYOLOGY, Order Thoracici, Plate IX.

- Fig. 1. *Perca Brasiliensis*, Brazilian Perch
 2. *Perca faxatilis*, Rock Perch
 3. *Perca punctata*, Dotted Perch
 4. *Perca guttata*, Guttated Perch
 5. *Perca maculata*, Spotted Perch
 6. *Perca bimaculata*, Bimaculated Perch

GENUS TRACHYCHTHYS.

116. Lettered ICHTHYOLOGY, Order Thoracici, Plate XI.

- Fig. 4. *Trachyichthys australis*, Australasian Trachyichthys

GENUS GASTEROSTEUS.

- Fig. 3. *Gasterosteus aculeatus*, Stickleback

GENUS SCOMBER.

117. Lettered ICHTHYOLOGY, Order Thoracici, Plate XII.

- Fig. 1. *Scomber Sarda*, (*Scomber Scomber*, Linn.) Common Mackerel
 2. *Scomber niger*, Black Mackerel
 3. *Scomber saliens*, Salient Mackerel
 4. *Scomber ruber*, Red Mackerel

116. Lettered ICHTHYOLOGY, Order Thoracici, Plate XI.

- Fig. 5. *Scomber Rotleri*, Rotlerian Mackerel
 6. *Scomber aculeatus*, Aculeated Mackerel

GENUS MULLUS.

118. Lettered ICHTHYOLOGY, Order Thoracici, Plate XIII.

- Fig. 1. *Mullus surmuletus*, Surmullet

GENUS TRIGLA.

- Fig. 2. *Trigla Carolina*, Caroline Gurnard
 3. *Trigla Hirundo*, Swallow Gurnard
 5. *Trigla cataphraetus*, Mailed Gurnard
 4. *Trigla punctata*, Dotted Gurnard

GENUS LONCHIURUS.

117. Lettered ICHTHYOLOGY, Order Thoracici, Plate XII.

- Fig. 5. *Lonchiusus barbatus*, Bearded Lonchiusus

ORDER ABDOMINALES.

GENUS COBITIS.

119. Lettered ICHTHYOLOGY, Order Abdominales, Plate V.

- Fig. 4. *Cobitis fossilis*, Great Loche

GENUS ANABLEPS.

- Fig. 5. *Anableps tetropthalmus*, Four-eyed Anableps

GENUS SILURUS.

- Fig. 1. *Silurus clarias*, Long-bearded Silurus

PLATE

GENUS PLATYSTACHUS.

119. Fig. 6. *Platystachus anguillaris*, Eel-shaped Platystachus

GENUS LORICARIA.

- Fig. 2. *Loricaria costalis*, Ribbed Loricaria
3. *Loricaria flava*, Yellow Loricaria

GENUS SALMO.

120. Lettered ICHTHYOLOGY, Order Abdominales, Plate III.

- Fig. 1. *Salmo bimaculatus*, Bimaculated Salmon
2. *Salmo fasciatus*, Banded Salmon
3. *Salmo tumbil*, Barred Salmon
4. *Salmo Odoe*, Odoe Salmon
5. *Salmo Gasteropelecus*, Yellow-finned Salmon
6. *Salmo Friderici*, Frederician Salmon
7. *Salmo rhombeus*, Rhombic Salmon

GENUS FISTULARIA.

121. Lettered ICHTHYOLOGY, Order Abdominales, Plate II.

- Fig. 1. *Fistularia chinensis*, Chinese Tobacco-pipe Fish
2. *Fistularia tabaccaria*, Spotted Tobacco-pipe Fish

GENUS ESOX.

- Fig. 3. *Esox offuscus*, Bony Gar Fish, or Sea Pike
4. *Esox Belone*, Sea Pike, or Gar Fish
5. *Esox brasiliensis*, Brazilian Pike, or Gar Fish

GENUS ELOPS.

- Fig. 6. *Elops Saurus*, Saury Elops

GENUS ARGENTINA.

- Fig. 7. *Argentina Sphyræna*, European Argentine

GENUS ATHERINA.

122. Lettered ICHTHYOLOGY, Order Abdominales, Plate I.

- Fig. 1. *Atherina Hepsetus*, Common Atherine

GENUS MUGIL.

- Fig. 2. *Mugil Tang*, Tang Mullet
3. *Mugil cephalus*, Grey Mullet

GENUS EXOCETUS.

- Fig. 4. *Exocoetus evolvans*, Mediterranean Flying Fish
5. *Exocoetus exiliens*, Swallow Flying Fish
6. *Exocoetus Mesogaster*, Atlantic Flying Fish

GENUS POLYNEMUS.

123. Lettered ICHTHYOLOGY, Order Abdominales, Plate IV.

- Fig. 1. *Polynemus paradysicus*, Paradise Polyneme
2. *Polynemus decadaetylus*, Ten-fingered Polyneme

PLATE

GENUS CLUPEA.

123. Fig. 3. *Clupea Thrissa*, Thrifta Herring
4. *Clupea najas*, Nafal Herring

GENUS CYPRINUS.

- Fig. 5. *Cyprinus cultratus*, Razor Carp
6. *Cyprinus auratus*, Golden Carp, var.
7. *Cyprinus phoxinus*, Minnow

ORDER BRANCHIOSTEGI.

GENUS OSTRACION.

124. Lettered ICHTHYOLOGY, Order Branchiofegi, Genus Ostracion, Plate V.

- Fig. 1. *Ostracion turritus*, Eared Trunk Fish
2. *Ostracion triguter*, Triangular Trunk Fish
3. *Ostracion najas*, Snouted Trunk Fish
4. *Ostracion bicaudalis*, Bicaudate Trunk Fish
5. *Ostracion quadricornis*, Four-horned Trunk Fish
6. *Ostracion cornutus*, Horned Trunk Fish

GENUS TETRODON.

125. Lettered ICHTHYOLOGY, Order Branchiofegi, Plate V.

- Fig. 1. *Tetrodon hispidus*, Hispid Tetrodon
2. *Tetrodon ocellatus*, Ocellated Tetrodon
3. *Tetrodon lineatus*, Lineated Tetrodon
4. *Tetrodon lagocephalus*, Hare Tetrodon

GENUS DIODON.

- Fig. 5. *Diodon Hystrix*, Porcupine Diodon
6. *Diodon orbicularis*, Round Diodon

GENUS SYNGNATHUS.

126. Lettered ICHTHYOLOGY, Order Branchiofegi, Plate VI.

- Fig. 1. *Syngnathus foliatus*, Foliated Pipe Fish
2. *Syngnathus acus*, Great Pipe Fish
3. & 3.* *Syngnathus Hippocampus*, Sea-Horse Pipe Fish

GENUS PEGASUS.

- Fig. 4. & 4.* *Pegasus Draconis*, Dragon Pegasus
5. & 5.* *Pegasus natans*, Swimming Pegasus

GENUS CENTRISCUS.

- Fig. 6. *Centriscus scutatus*, Mailed Centriscus

GENUS BALISTES.

127. Lettered ICHTHYOLOGY, Order Branchiofegi, Plate III.

- Fig. 1. *Balistes vetula*, Old Wife
2. *Balistes maculatus*, Spotted Old Wife
3. *Balistes aculeatus*, Aculeated Old Wife
4. *Balistes monoceros*, One-horned Old Wife

GENUS CYCLOPTERUS.

128. Lettered ICHTHYOLOGY, Order Branchiofegi, Plate IV.

- Fig. 1. *Cyclopterus Lumpus*, Common Lump-fucker

PLATE

128. Fig. 2. *Cyclopterus ocellatus*, Ocellated Lump-fucker
3. *Cyclopterus lineatus*, Lineated Lump-fucker

GENUS LOPHIUS.

- Fig. 4. *Lophius marmoratus*, Marbled Angler
5. *Lophius Hiftrio*, Harlequin Angler
6. *Lophius rostratus*, Beaked Angler
7. *Lophius pictus*, Painted Angler

ORDER CHONDROPTERYGII.

GENUS ACIPENSER.

129. Lettered ICHTHYOLOGY, Order Chondropterygii, Plate I.

- Fig. 3. *Acipenser Sturio*, Common Sturgeon
+ *Acipenser Ruthenus*, Sterlet

GENUS CHIMERA.

- Fig. 2. *Chimera monstrosa*, Sea-monster
5. *Chimera calborhynchus*, Southern Sea-monster

GENUS PRISTIS.

- Fig. 1. *Pristis antiquorum*, Common Saw-fish

GENUS SQUALUS.

130. Lettered ICHTHYOLOGY, Order Chondropterygii, Plate II.

- Fig. 1. *Squalus glaucus*, Blue Shark
2. *Squalus Catulus*, Lesser spotted Shark
3. *Squalus Squatina*, Angel Shark
4. *Squalus Zygena*, Hammer-headed Shark
5. *Squalus Zebra*, Zebra Shark

GENUS SPATULARIA.

- Fig. 6. *Spatularia reticulata*, Reticulated Spatularia

GENUS RAJA.

131. Lettered ICHTHYOLOGY, Order Chondropterygii, Plate VI.

- Fig. 1. *Raja diabolus*, Dæmon Ray
2, 3. *Raja clavata*, Thorn-back
4. *Raja undulata*, Undulated Ray
5. *Raja torpedo*, Electric Ray
6. *Raja rhinobatos*, Long-nosed Ray

GENUS GASTROBRANCHUS.

132. Lettered ICHTHYOLOGY, Order Chondropterygii, Plates III., IV., V.

- Fig. 1. *Gastrobranchus coecus*, Hag-fish
2. *Gastrobranchus Dombeyi*, Dombeyan Hag-fish

GENUS PETROMYZON.

- Fig. 3. *Petromyzon marinus*, Marine Lamprey
4. *Petromyzon fluviatilis*, River Lamprey
5. *Ditto*, the young, shewing the under surface

PLATE

ENTOMOLOGY.

CLASS INSECTA.

ORDER COLEOPTERA.

GENUS SCARABÆUS.

133. Lettered ENTOMOLOGY, Order Coleoptera, Plate I.

- Fig. 1. *Scarabeus Hercules*
2. *Scarabeus Chorineus*
3. *Scarabeus Tityus*
4. *Scarabeus molossus*
5, 6. *Scarabeus carnifex*, male and female
7. *Scarabeus sacer*

GENUS GOLIATHUS.

134. Lettered ENTOMOLOGY, Genus Goliathus, Plate I.

- Fig. 1. *Goliathus Cæcius*
2. *Goliathus magnus*

GENUS LUCANUS.

135. Lettered ENTOMOLOGY, Order Coleoptera, Plate IV.

- Fig. 1. *Lucanus cervus*
2. *Lucanus inermis*

GENUS DERMESTES.

- Fig. 3. *Dermestes viginti-guttatus*
4. *Dermestes sex-dentatus*
5. *Dermestes brachypterus*
6. *Dermestes pedicularius*
7. *Dermestes picipes*

GENUS BOSTRICHIUS.

136. Lettered ENTOMOLOGY, Order Coleoptera, Plate V.

- Fig. 12. *Bostrichus pubescens*
1. *Bostrichus polygraphus*
2. *Bostrichus typographus*
3. *Bostrichus piniperda*

GENUS MELYRIS.

137. Lettered ENTOMOLOGY, Order Coleoptera, Plate XII.

- Fig. 13. *Melyris viridis*

GENUS PTINUS.

136. Lettered ENTOMOLOGY, Order Coleoptera, Plate V.

- Fig. 4. *Ptinus Scotius*
5. *Ptinus Imperialis*
6. *Ptinus sex-punctatus*
7. *Ptinus tessellatus*
8. *Ptinus pectinicornis*

GENUS HISTER.

- Fig. 9. *Hister unicolor*
10. *Hister planus*

GENUS GYRINUS.

- Fig. 11. *Gyrinus natator*

GENUS BYRRHUS.

137. Lettered ENTOMOLOGY, Order Coleoptera, Plate XII.

- Fig. 1. *Byrrhus pilula*

PLATE

GENUS ANTHRENUS.

137. Fig. 2. *Anthrenus Scrophularie*

GENUS SILPHA.

- Fig. 6. *Silpha Germanica*
 7. *Silpha vespillo*
 8. *Silpha thoracica*
 9. *Silpha humator*
 10. *Silpha obscura*
 11. *Silpha quadrimaculata*
 12. *Silpha sinuata*

135. Lettered ENTOMOLOGY, Order Coleoptera, Plate IV.

- Fig. 8. *Silpha hemorrhoidalis*
 9. *Silpha rufipes*
 10. *Silpha quadri-guttata*
 11. *Silpha marginalis*

GENUS OPATRUM.

138. Lettered ENTOMOLOGY, Order Coleoptera, Plate IX.

- Fig. 1. *Opatrum fabulosum*

GENUS TRITOMA.

- Fig. 2. *Tritoma rufipes*
 3. *Tritoma pileosa*

GENUS TETRATOMA.

- Fig. 4. *Tetratoma cinnamomeum*
 5. *Tetramona fungorum*
 6. *Tetratoma ancora*

GENUS CASSIDA.

- Fig. 7. *Cassida grossa*
 8. *Cassida lateralis*
 9. *Cassida cruentata*
 10. *Cassida maculata*

GENUS COCCINELLA.

139. Lettered ENTOMOLOGY, Order Coleoptera, Plate XIII.

- Fig. 1. *Coccinella 16-guttata*
 2. *Coccinella oblongo-guttata*
 3. *Coccinella 12-pustulata*
 4. *Coccinella frontalis*
 5. *Coccinella 12-punctata*
 6. *Coccinella 22-punctata*
 7. *Coccinella septem-notata*
 8. *Coccinella 4-pustulata*
 9. *Coccinella punctata*
 10. *Coccinella analis*
 11. *Coccinella parvula*
 12. *Coccinella 6-pustulata*

GENUS CHRYSOMELA.

140. Lettered ENTOMOLOGY, Order Coleoptera, Genus Chrysomela, Plate XIII.

- Fig. 1. *Chrysomela gigantea*
 2. *Chrysomela surinamensis*
 3. *Chrysomela 20-punctata*
 4. *Chrysomela cyanicornis*

PLATE

- Fig. 5. *Chrysomela cyanipes*
 6. *Chrysomela limbata*
 7. *Chrysomela didymus*
 8. *Chrysomela boleti*
 9. *Chrysomela 14-guttata*
 10. *Chrysomela marginalis*
 11. *Chrysomela marginata*
 12. *Chrysomela marginella*
 13. *Chrysomela hannoversiana*

GENUS CRYPTOCEPHALUS.

141. Lettered ENTOMOLOGY, Order Coleoptera, Plate VIII.

- Fig. 1. *Cryptocephalus cordiger*
 2. *Cryptocephalus variabilis*
 3. *Cryptocephalus distinguendus*
 4. *Cryptocephalus lobatus*
 5. *Cryptocephalus obfcurus*

GENUS CISTELA.

137. Lettered ENTOMOLOGY, Order Coleoptera, Plate XII.

- Fig. 3. *Cistela pallida*
 4. *Cistela leta*
 5. *Cistela lepturoides*

GENUS CRIOCERIS.

141. Lettered ENTOMOLOGY, Order Coleoptera, Plate VIII.

- Fig. 6. *Crioceris campestris*
 7. *Crioceris punctatus*

GENUS HISPA.

- Fig. 8. *Hispa mutica*

GENUS BRUCHUS.

- Fig. 9. *Bruchus bipunctatus*

GENUS PAUSUS.

- Fig. 10. *Pausus denticornis* (Donov. Ind. Inf.)
 11. *Pausus thoracicus* (Donov. Ind. Inf.)
 12. *Pausus Fichtelii* (Donov. Ind. Inf.)
 13. *Pausus pectinicornis* (Donov. Ind. Inf.)

GENUS CURCULIO.

142. Lettered ENTOMOLOGY, Order Coleoptera, Plate XI.

- Fig. 1. *Curculio bimaculatus*
 2. *Curculio palmarum*
 3. *Curculio elegans*
 4. *Curculio annulatus*
 5. *Curculio imperialis*
 6. *Curculio eremitus*
 7. *Curculio hemipterus*
 8. *Curculio brachypteros* (nigro spinosus)
 9. *Curculio assimilis*
 10. *Curculio rhinomacrer*
 11. *Curculio regalis* (Donov. Ind. Inf.)
 12. *Curculio bilineatus*
 13. *Curculio viridis*
 14. *Curculio badius*
 15. *Curculio betule*

PLATE

GENUS PRIONUS.

143. Lettered ENTOMOLOGY, Order Coleoptera, Plate II.

- Fig. 1. *Prionus longimanus*
2. *Prionus unidentatus*

GENUS CERAMBYX.

- Fig. 3. *Cerambyx imperialis*

GENUS LAMIA.

- Fig. 4. *Lamia quadrimaculata*

GENUS CLYTUS.

- Fig. 5. *Clytus thoracicus*

GENUS SAPERDA.

- Fig. 6. *Saperda collaris*
7. *Saperda nigro-virens*

GENUS RHAGIUM.

- Fig. 8. *Rhagium bifasciatum*

GENUS CICINDELA.

144. Lettered ENTOMOLOGY, Order Coleoptera, Plate X.

- Fig. 1. *Cicindela campestris*
2. *Cicindela sylvatica*
3. *Cicindela flexuosa*
4. *Cicindela sinuata*
5. *Cicindela capensis*
6. *Cicindela littoralis*
7. *Cicindela germanica*
8. *Cicindela riparia*
9. *Cicindela paludosa*
10. *Cicindela aquatica*
11. *Cicindela flavipes*

GENUS DYTISCUS.

145. Lettered ENTOMOLOGY, Order Coleoptera, Plate XII.

- Fig. 1. *Dytiscus piceus*
2. *Dytiscus latissimus*
3. *Dytiscus marginatus*
4. *Dytiscus cinereus*
5. *Dytiscus caraboides*
6. *Dytiscus fulcatus*
7. *Dytiscus minutus*
8. *Dytiscus bipustulatus*
9. *Dytiscus uliginosus*

GENUS CARABUS.

146. Lettered ENTOMOLOGY, Order Coleoptera, Plate XV.

- Fig. 1. *Carabus sexmaculatus*
2. *Carabus sycophanta*
3. *Carabus punctatus*
4. *Carabus auronitens*

PLATE

146. Fig. 5. *Carabus arenarius*
6. *Carabus granulatus*
7. *Carabus iboracicus*
8. *Carabus bimaculatus*
9. *Carabus germanus*
10. *Carabus prasinus*
11. *Carabus cruceus minor*
12. *Carabus semipunctatus*

GENUS TENEBRIO.

147. Lettered ENTOMOLOGY, Order Coleoptera, Plate XI.

- Fig. 1. *Tenebrio gigas*
2. *Tenebrio femoratus*
3. *Tenebrio molitor*
4. *Tenebrio curvipes*
5. *Tenebrio culinaris*
6. *Tenebrio ferrugineus*

GENUS PIMELIA.

- Fig. 7. *Pimelia gages*
8. *Pimelia sepium*
9. *Pimelia tragopista*

GENUS HELOPS.

- Fig. 10. *Helops lanipes*
11. *Helops fasciata*
12. *Helops fulva*

GENUS LYTTA.

148. Lettered ENTOMOLOGY, Order Coleoptera, Plate VI.

- Fig. 1. *Lytta vesicatoria*
2. *Lytta dubia*
15. *Lytta Schaefferi*

GENUS MELOE.

- Fig. 3. *Meloe proscarabeus*
4. *Meloe variegatus*

GENUS MORDELLA.

- Fig. 5. *Mordella bicolor*
6. *Mordella flava*
7. *Mordella dorsalis*
8. *Mordella frontalis*

GENUS MYLABRIS.

- Fig. 9—11. *Mylabris cichorei*, var.

GENUS STAPHYLINUS.

- Fig. 12. *Staphylinus hirtus*

GENUS FORFICULA.

- Fig. 13, 14. *Forficula gigantea*

149. Lettered ENTOMOLOGY, Coleoptera, Plate III.
Supplementary Plate of the Order Coleoptera*

* This Plate, which we have placed as an Appendix to the Coleoptera tribe, was engraved and published in the Cyclopædia before the Proprietors had determined to under-
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take the very ample elucidation of the subject, which they were afterwards induced to adopt. The selection of the subjects had been also left at the discretion of the artist ;

NATURAL HISTORY.

PLATE

ORDER HEMIPTERA.

150. Lettered ENTOMOLOGY, Order Hemiptera, Plate I.

Fig. 1. *Blatta orientalis*

GENUS MANTIS.

- Fig. 2. *Mantis bipinosa*
 3. *Mantis precaria*
 4. *Mantis gongyloides*
 5. *Mantis strumaria*

GENUS GRYLUS.

151. Lettered ENTOMOLOGY, Order Hemiptera, Plate II.

- Fig. 1. *Gryllus Dux*
 2. *Gryllus nufutus*
 3. *Gryllus viridissimus minor*
 4. *Gryllus subulata*
 5. *Gryllus Gryllo-talpa*
 6. Larva of *Gryllus*
 7. Pupa of *Gryllus morbillosus*

GENUS FULGORA.

152. Lettered ENTOMOLOGY, Order Hemiptera, Plate III.

- Fig. 1. *Fulgora Lanternaria*, in a resting position
 2. with expanded wings
 3. *Fulgora candelaria*
 4. *Cicada Tibicini*, (*Tettigonia*, Fabr.)
 5. *Cicada hematodes*
 6. *Cicada stridula*
 7. *Cicada phalenoïdes*
 8. *Cicada sanguinolenta*
 9. *Cicada taurus*
 10. *Cicada spinosa*

PLATE

GENUS NOTONECTA.

152. Fig. 11. *Notonecta glauca*

GENUS NEPA.

153. Lettered ENTOMOLOGY, Order Hemiptera, Plate IV.

Fig. 1. *Nepa grandis*

GENUS CIMEX.

- Fig. 2. *Cimex lectularius*
 3. *Cimex aurantius*

GENUS APHIS.

- Fig. 4. *Aphis persica*
 5. *Aphis salicis*
 6. *Aphis gallarum*

GENUS CHERMES.

- Fig. 7. *Chermes alni*
 8. *Chermes buxi*

GENUS COCCUS.

- Fig. 9. *Coccus Fol. Quercus*
 10. *Coccus persica*
 11. *Coccus hesperidum*
 12. *Coccus cataphraëus*

GENUS THRIPS.

- Fig. 13. *Thrips physapus*
 14. *Thrips juniperina*

and these, it must be allowed, were not chosen altogether with that due attention to accuracy which the intricacy of this branch of Natural History demanded. These insects were copied, we understand, from specimens in the very valuable cabinet of Mr. Francillon; but owing to the dispersion of that collection by public sale, the means of comparison has passed away, and the death of the artist then employed, as well as of the zealous proprietor of that collection, has opposed a period to enquire further. The far greater and more costly portion of the Francillonian Cabinet is indeed preserved, being incorporated in the princely cabinet of Alexander M^cLeay, Esq., a cabinet to which true science is never refused an easy access; but the insects in question having been removed from their respective situations, in Mr. Francillon's drawers, they can be no longer recognized as the specimens from which the figures in this plate are taken; and this, in some few instances at least, it must be confessed, is requisite to enable us to speak of them with certainty. We may observe, moreover, that very few names accompany the articles represented in this Plate of Mr. Edwards; and of those few some are certainly faulty. *Hispa* is doubtful (a true *Hispa* has been since given in Plate 141. fig. 8.). *Bruchus* is erroneous, and appears to

be, with the exception of the antennæ, *Attelabus Coryli*; (a true *Bruchus* is inserted by us in Plate 141. fig. 9.); and his insect named *Attelabus*, has much the appearance of *Mylabris*, except in having pectinated instead of moniliform antennæ: nevertheless this may be a *Clerus*, and allied to *Aparius*. (See Plate 148. fig. 9.) *Lampyrus* is indifferently; *Cantharis* unintelligible. With these, and some few other exceptions, the Plate should be preserved, as it contains other insects of interest, the repetition of whose figures has been purposely avoided in selecting the materials for the rest of the Plates of Coleoptera.

We believe *Curculio*, No. 1. to be *Curculio bipinifolus*; No. 3. to be *Curculio Imperialis*, the Brazilian or Diamond Beetle; No. 4. *Curculio vittata*, of Jamaica; *Cerambyx*, No. 3., *C. Mofchatus*; No. 4. *Cerambyx marginatus*; *Necydalis*, No. 2., *N. cerulea*; *Lampyrus*, fig. 1., *L. vulgaris*, male (having wings); No. 2. the female (being apterous, or without wings); *Elatér*, No. 1., *E. ocellatus*, West Indies; No. 2. is uncertain; but is, no doubt, an *Elatér*, placed on its back, to shew the situation of the pointed sternum in that genus, by striking which upon the breast, the insect is enabled to spring up with instantaneous velocity when laid down in that position.

ORDER LEPIDOPTERA.

GENUS PAPILIO.

154. Lettered ENTOMOLOGY, Order Lepidoptera, Plate I.

- Fig. 1. *Papilio Hector*, *Eq. Troës* 1. Upper figure on the left hand
 2. *Papilio Echius*, *Eq. Troës* 2. Right-hand side, middle figure
 3. *Papilio Deiochus*, *Eq. Achiv.* 2. Left-hand side, middle figure
 4. *Papilio Agamemnon*, *Eq. Achiv.* 2. Lowest figure on the left hand
 5. *Papilio Machaon*, *Eq. Achiv.* 3. Lowest figure on the right hand
 6. *Papilio Medon*, *Eq. Achiv.* 4. Upper figure on the right hand
 7. *Papilio Mecystes*, *Eq. Achiv.* 5. Butterfly with erect wings, in the middle of the Plate

GENUS SPHINX.

155. Lettered ENTOMOLOGY, Order Lepidoptera, Plate VII.

- Fig. 1. *Sphinx rustica*. The largest figure in the lower part of the Plate
 2. *Sphinx vitis*. The largest figure in the upper part of the Plate
 3. *Sphinx Ello*. Shewing the natural erect position of the wings in this family of Sphinges, when they are at rest. Placed on the left hand, towards the middle of the Plate
 4. *Sphinx fuciformis*, (*Sesia*, Fabricius). Upper figure on the left hand
 5. *Sphinx chrysothorax*, (*Sesia*, Fabricius). Lowest figure in the Plate on the left side
 6. *Sphinx tipuliformis*, (*Sesia*, Fabricius). Smallest figure in the Plate, and placed in the centre, in a flying position
 7. *Sphinx Polymena*, (*Zygena* of Fabricius, *Donov.* Inf. China). Right hand, towards the middle of the Plate
 8. *Sphinx fausta*, (*Zygena fausta*, Fabricius). Bottom figure of the Plate on the right hand

GENUS PHALÆNA.

156. Lettered ENTOMOLOGY, Order Lepidoptera, Plate I. Phalæna

- Fig. 1. *Phalæna Atlas* (*Bombyx fam.*), with wings expanded

157. Lettered ENTOMOLOGY, Order Lepidoptera, Plate II.

- Fig. 1. *Phalæna Saturnus* (*Bombyx*)

156. Lettered ENTOMOLOGY, Order Lepidoptera, Plate I.

- Fig. 2. *Phalæna Laocoon* (*Bombyx*)
 3. *Phalæna Luna* (*Bombyx*)
 4. *Phalæna Pavonia* (*Bombyx*)
 5. *Phalæna Tau* (*Bombyx*)

157. Lettered ENTOMOLOGY, Order Lepidoptera, Plate II.

- Fig. 2. *Phalæna Quercifolia* (*Bombyx*), with wings reversed
 3. *Phalæna potatoria* (*Bombyx*)
 4. *Phalæna versicolora* (*Bombyx*)
 5. *Phalæna vinula* (*Bombyx*)
 6. *Phalæna Hebe* (*Bombyx*), with wings deflected

ORDER NEUROPTERA.

GENUS LIBELLULA.

158. Lettered ENTOMOLOGY, Order Neuroptera, Plate I.

- Fig. 1. *Libellula indica*
 2. *Libellula grandis*, (*Æbna* genus, Fabr.)
 3. *Libellula clavata*, (*Æbna*, Fabr.)
 4. *Libellula linearis*, (*Agriion* genus, Fabr.)
 5. *Libellula virgo*, (*Agriion*, Fabr.)
 6. *Libellula puella*, (*Agriion*, Fabr.)

GENUS EPHEMERA.

- Fig. 7. *Ephemera vulgata*

GENUS PHRYGANEÆ.

- Fig. 8. *Phryganeæ varia*

GENUS HEMEROBIUS.

159. Lettered ENTOMOLOGY, Order Neuroptera, Plate II.

- Fig. 1. *Hemerobius chryops*

GENUS MYRMELEON.

- Fig. 2. *Myrmeleon Libelluloides*
 3. *Myrmeleon Americanus*, (*Ascalaphus Americanus*, Fabr.)
 4. *Myrmeleon barbarus*, (*Ascalaphus barbarus*, Fabr.)

GENUS PANORPA.

- Fig. 5. *Panorpa communis*
 6. *Panorpa coa*

GENUS RAPHTIDIA.

- Fig. 7. *Raphidia ophiopsis*

ORDER HYMENOPTERA.

GENUS CYNIPS.

160. Lettered ENTOMOLOGY, Order Hymenoptera Plate XI.

- Fig. 1. *Cynips quercus folii*

GENUS TENTHREDO.

- Fig. 2. *Tenthredo bimaculata*
 3. *Tenthredo femorata*
 4. *Tenthredo falcicornis*

GENUS SIREX.

- Fig. 5. *Sirex gigas*
 6. *Sirex juvenicus*

PLATE

GENUS SPHEX.

160. Fig. 7. *Sphex lobata*
 161. Lettered ENTOMOLOGY, Order Hymenoptera, Plate III.
 Fig. 1. *Sphex fabulosa*, (*Ammophila*, Kirby)

GENUS ICHNEUMON.

160. Lettered ENTOMOLOGY, Order Hymenoptera, Plate XI.
 Fig. 8. *Ichneumon flavicornis*
 9. *Ichneumon persuaforius*

GENUS SCOLIA.

161. Lettered ENTOMOLOGY, Order Hymenoptera, Plate III.
 Fig. 2. *Scolia flavifrons*

GENUS THYNNUS.

- Fig. 3. *Thynnus emarginatus*

GENUS LEUCOPSIS.

- Fig. 4. *Leucopsis dorfigera*

GENUS TIPHIA.

- Fig. 5. *Tiphia nudata*
 6. *Tiphia villosa*

GENUS CHALCIS.

- Fig. 7. *Chalcis sfpes*

GENUS CHRYSIS.

- Fig. 8. *Chrysis splendida*
 9. *Chrysis amethystina*
 10. *Chrysis fasciata*
 11. *Chrysis ignita*

GENUS VESPA.

162. Lettered ENTOMOLOGY, Order Hymenoptera, Plate XIII.
 Fig. 1. *Vespa cinêa*
 2. *Vespa teflacea*
 3. *Vespa arcuata*
 4. *Vespa fasciata*

GENUS APIS.

- Fig. 5. *Apis festiva*
 6. *Apis violacea*
 7. *Apis efluans*

GENUS FORMICA.

- Fig. 8. *Formica gigas*
 9. *Formica bengalensis*
 10. *Formica bibamata*

GENUS MUTILLA.

- Fig. 11. *Mutilla Americana*, (female)
 12. *Mutilla bengalensis*
 13. *Mutilla rubra*

PLATE

ORDER DIPTERA.

GENUS OESTRUS.

163. Lettered ENTOMOLOGY, Order Diptera, Plate II.
 Fig. 1, 2. *Oestrus equi*
 3. *Oestrus bovis*
 4. *Oestrus ovis*

GENUS TIPULA.

- Fig. 5. *Tipula rivosa*
 6. *Tipula horitorum*
 7. *Tipula variegata*
 8. *Tipula crocata*
 9. *Tipula punctata*
 10. *Tipula atrata*
 11. *Tipula plumosa*
 12. *Tipula peñiniicornis*

GENUS DIOPSIS.

- Fig. 13. *Diopsis ichneumonea*

GENUS MUSCA.

164. Lettered ENTOMOLOGY, Order Diptera, Plate IV.
 Fig. 1. *Musca grossa*, hair of the antennæ naked
 2. *Musca hottentotta*
 3. *Musca bifasciata*
 4. *Musca cupraria*
 5. *Musca vibrans*
 6. *Musca scybalaria*
 7. *Musca solitatis*
 8. *Musca onopordinis*
 9. *Musca stellata*
 10. *Musca fasciata*
 11. *Musca Chamæleon*, (*Stratiomys Chamæleon*, Fabr.)
 12. *Musca morio*
 13. *Musca clavicornis*, (*Ceria clavicornis*, Fabr.)
 14. *Musca scolopacea*, (*Rhagio scolopacea*, Fabr.)
 15. *Musca triangularia*
 16. *Musca analis*, (*Bibio analis*, Fabr.)
 17. *Musca tenax*, (*Syrphus tenax*, Fabr.)
 18. *Musca pendula*, (*Syrphus*, Fabr.)
 19. *Musca florea*, (*Syrphus*, Fabr.)
 20. *Musca lurida*
 21. *Musca vespiformis*
 22. *Musca nothiluca*
 23. *Musca bilineata*
 24. *Musca uliginosa*, (*Nemotelus uliginosus*, Fabr.)

GENUS TABANUS.

165. Lettered ENTOMOLOGY, Diptera, Plate IV.
 Fig. 1. *Tabanus bovinus*
 2. *Tabanus tropicus*
 3. *Tabanus bromius*
 4. *Tabanus pluvialis*
 5. *Tabanus ruficrus*
 6. *Tabanus cecutiens*

GENUS CULEX.

- Fig. 7. 7.* *Culex pipiens*, natural size and magnified

NATURAL HISTORY.

PLATE

GENUS EMPIS.

165. Fig. 8. *Empis forcipata*
9. *Empis borealis*

GENUS STOMOXYS.

- Fig. 10. *Stomoxys rostrata*
11. *Stomoxys irritans*
12. *Stomoxys calcitrans*
13. *Stomoxys pungens*

GENUS CONOPS.

166. Lettered ENTOMOLOGY, Order Diptera, Plate I.

- Fig. 1. *Conops ferruginea*
2. *Conops aculeata*
3. *Conops petiolata*

GENUS ASILUS.

- Fig. 4. *Asilus teutonius*
5. *Asilus gibbosus*
6. *Asilus crabroniformis*

GENUS BOMBYLIUS.

- Fig. 7. *Bombylius major*
8. *Bombylius medius*

GENUS HIPPOBOSCA.

- Fig. 9. *Hippobosca equina*
10. *Hippobosca ovina*
11. *Hippobosca avicularia*
12. *Hippobosca hirundinis*

APTERA.

GENUS TERMES.

167. Lettered Plate V. Aptera

- Fig. 1. *Termes bellicosus*, Great African White Ant
2. Labourers
3. Soldiers
4. King
4. Males, which are furnished with wings
5. 5. Pregnant Females, or Queens
(All the above are represented of their natural size)
6. *Termes bellicosus*, their Nests in the distance

GENUS LEPISMA.

- Fig. 7. *Lepisma Polypoda*
8. *Lepisma punctata*
9. *Lepisma obscura*
10. *Lepisma lineatus*

GENUS PODURA.

- Fig. 11. *Podura Villosa*, Upper and Under Surface

ORDER APTERA.

GENUS PEDICULUS.

168. Lettered ENTOMOLOGY, Order Aptera, Plate IV.

- Fig. 1. *Pediculus humanus*, Human Loufe
2. *Pediculus Aflini*, Afs's Loufe

PLATE

168. Fig. 3. *Pediculus cygni*, Swan's Loufe
4. *Pediculus corvi*, Crow's Loufe
5. *Pediculus pica*, Magpie's Loufe
6. *Pediculus gruis*, Crane's Loufe
7. *Pediculus Columbe*, Pigeon's Loufe
8. *Pediculus pluvialis*, Plover's Loufe
9. *Pediculus apis*, Bee's Loufe

GENUS PULEX.

- Fig. 10. 10.* *Pulex irritans*, Common Flea, natural size, and magnified

GENUS ACARUS.

- Fig. 11. *Acarus redurivius*, Tick

GENUS TROMBIDIUM.

- Fig. 12. *Trombidium aquaticum*
13. *Trombidium abstergens*

GENUS HYDRACHNA.

- Fig. 14. *Hydrachna geographica*
15. *Hydrachna abstergens*

GENUS NYMPHION.

169. Lettered ENTOMOLOGY, Order Aptera, Plate I.

- Fig. 1. *Phalangium Groffipes*, Linn. (*Nymphion*, Fabr.)

GENUS PYCNOGONUM.

- Fig. 2. *Phalangium balenarum*, Linn. (*Pycnogonum*, Fabr.)
Fig. 3. *Phalangium hirsutum*, Linn. (*Pycnogonum*, Fabr.)

GENUS PHALANGIUM.

- Fig. 4. 4. *Phalangium Cancroides*, (*Tarantula*, Linn. Trans.?) natural size, and magnified
5. *Phalangium cornutum*, (*Scorpio cimicoides*, Fabr.)

GENUS TARANTULA.

- Fig. 6. 6. *Tarantula reniforme*, male and female
7. *Tarantula caudata*

GENUS ARANEA.

170. Lettered ENTOMOLOGY, Order Aptera, Plate II.

- Fig. 1. *Aranea extensa*
2. *Aranea globosa*
3. *Aranea bimaculata*
5. *Aranea fasciata*
6. *Aranea angulata*
7. *Aranea Tarantula*
8. *Aranea avicularia*
9. *Aranea maculata*

The Position of the Eyes in different Tribes of Spiders.

- No. 1. in *Aranea extensa*. No. 2. *Aranea globosa*. No. 3. *Aranea horrida*. No. 4. *Aranea argentata*. No. 5. *Aranea fasciata*. No. 6. *Aranea angulata*. No. 7. *Aranea Tarantula*. No. 8. *Aranea avicularia*. No. 9. *Aranea maculata*

NATURAL HISTORY.

PLATE

GENUS SCORPIO.

171. Lettered ENTOMOLOGY, Order Aptera, Plate III.
 Fig. 1, 2. *Scorpio afer*, Great Scorpion. Upper Surface, No. 1. Under Surface, No. 2.
 3. *Scorpio linearis*, Linear Scorpion. Upper Surface
 4. *Scorpio linearis*, Linear Scorpion. Under Surface
 5. *Scorpio europæus*, European Scorpion

CRUSTACEA.

GENUS CANCER.

172. Lettered CRUSTACEA, Order Cancer, Plate I.
 Fig. 1. *Cancer curicola*
 2. *Cancer fascicularis*
 3. *Cancer Facchino* (*Dorippe Facchino*)
 4. *Cancer Dormio* (*Dormio artificiosa*)
173. Lettered CRUSTACEA, Order Cancer, Plate II.
 Fig. 5. *Cancer mensiblo* (*Portunus mensiblo*)
 6. *Cancer forceps* (*Portunus forceps*)
 7. *Cancer mammillaris* (*Orithyia mammillaris*)
 8. *Cancer lunaris* (*Matuta lunaris*)
174. Lettered CRUSTACEA, Genus Cancer, Plate III, IV., V.
 Fig. 1. *Cancer depressus*
 2. *Cancer perlatus*
 3. *Cancer perforatus*

GENUS PAGURUS.

175. Lettered CRUSTACEA, Genus Cancer, Plate VII. Entomology
 Fig. 3. *Cancer strigatus* (*Pagurus strigatus*)
 5. *Cancer dubius* (*Pagurus dubius*)
176. Lettered CRUSTACEA, Order Cancer, Plate VI.
 Fig. 1. *Cancer arrofor* (*Pagurus arrofor*)
 2. *Cancer canaliculatus* (*Pagurus canaliculatus*)
 3. *Cancer excavatus* (*Pagurus excavatus*)

GENUS ASTACUS.

- Fig. 4. *Cancer variegatus* (*Astacus variegatus*)
175. Lettered CRUSTACEA, Genus Cancer, Plate VII, Entomology
 Fig. 7. *Cancer fluviatilis* (*Astacus fluviatilis*)
 4. *Cancer narval* (*Astacus narval*)

GENUS SQUILLA.

- Fig. 2. *Cancer digitalis* (*Squilla digitalis*)
176. Lettered CRUSTACEA, Order Cancer, Plate VI.
 Fig. 4. *Cancer ampulla* (*Gammarus ampulla*)
 6. *Cancer linearis* (*Gammarus linearis*)
 5. *Cancer mantis* (*Gammarus mantis*)
 6. *Cancer spinosus* (*Gammarus spinosus*)
 7. *Cancer paludofus* (*Gammarus paludofus*), natural size, and magnified

PLATE

176. Fig. 8. *Cancer linearis* (*Gammarus linearis*)
 9. *Cancer pulex* (*Gammarus pulex*)

GENUS SCYLLARUS.

175. Lettered CRUSTACEA, Genus Cancer, Plate VII. Entomology
 Fig. 7. *Cancer Aræus* (*Scyllarus Aræus*)

GENUS MONOCULUS.

177. Lettered ENTOMOLOGY, Order Aptera, Plate X.
 Fig. 1. *Monoculus quadricornis*
 2, 2. *Monoculus polyphemus*, Upper Surface and Under Surface

GENUS ONISCUS.

- Fig. 3, 3. *Oniscus pfora*, Upper Surface and Under Surface
 4. *Oniscus crassipes*
 5. *Oniscus Oeßtrum*
 6. *Oniscus Oceanicus*
 7. *Oniscus aquaticus*
 8. *Oniscus armadillo*

GENUS SCOLOPENDRA.

- Fig. 9. *Scolopendra morfitans*

GENUS JULUS.

- Fig. 10. *Julus terrestris*

CLASS VI. VERMES.

ORDER INTESTINA.

GENUS ASCARIS.

178. Lettered VERMES, Order Intestina, Plate I., II., III.
 Fig. 1. *Ascaris vermicularis*

GENUS ECHINORYNCHUS.

- Fig. 2. *Echinorynchus lucii*
 Head magnified *
 2. *Echinorynchus candidus*
 Head magnified *
 3. *Echinorynchus coryphæus*
 4. *Echinorynchus lineolatus*
 Head magnified *
 5. *Echinorynchus attenuatus*, natural size, and magnified
 6. *Echinorynchus attenuatus*, natural size, adhering to the skin of a fish
 7. *Echinorynchus alba*
 8. *Echinorynchus brunnea*

GENUS LINGULATA.

9. *Lingulata abrupta*, Upper and Under Surface

GENUS FASCIOLA.

- Fig. 2. *Fasciola binodis*, the minute Figures which accompany the larger ones denote the natural Size
 3. *Fasciola Æglefni*, Ditto

PLATE

178. Fig. 4. *Fasciola Scorpii*, the minute Figures which accompany the larger ones denote the natural Size
 5. *Fasciola lucioperca*, Ditto
 6. *Fasciola brama*, Ditto

GENUS TÆNIA.

179. Lettered VERMES, Order Intestina, Plate V.

- Fig. 1. *Tenia folium*, grouped into folds in order to include the whole animal, which is of extreme length, within the limits of the Plate. Found in the human body
 2. The head, natural size, of a specimen twenty feet in length
 3. Head magnified
 7. Two joints retaining the external skin, and shewing the alternate disposition of the oscula along the edges of the joints as they usually appear
 8. Two joints shewing their lateral disposition when they occur on both the margins of each joint, which sometimes happens
 4. A portion of the joints of the natural size divested of the outer skin, and disclosing more fully the alternate lateral oscula, together with the alimentary canals, as they communicate from one joint to the other
 5. The middle system of vessels illustrated in another portion of four joints
 6. Another portion deprived of the outer coating, and displaying all the canals in their relative situation. Vide *Carlisle in Linn. Transf. v. 2.*
Tenia lata. *Carlisle in Linn. Transf. 2.—Tenia osculis lateralibus solitariis*, Linn. *Amoen. Acad. 2. ?*
 10. A portion of several joints exhibiting the oscula, which are disposed in a single series down the center of the joints
 11. Another portion divested of the outer coating, and shewing the stelliform vessels down the center within, and also the lateral alimentary canals. Found in the intestines of mankind
 9. *Tenia canina*, head, and a portion of the body, consisting of the five first joints. Found in the dog.

GENUS GORDIUS.

180. Lettered VERMES, Genus Gordius, Plate IV.

- Fig. 1. *Gordius aquaticus*

GENUS LUMBRICUS.

- Fig. 2, 3. *Lumbricus terrestris*

GENUS HIRUDO.

- Fig. 4. *Hirudo muricata*

5. *Hirudo geometra*. The smaller figures at No. 1. denote the eggs and natural size of the animal: No. 4. magnified shews the animal affixed by the broad pedal-like tail with the body extended horizontally: No. 3. the same contracting into an arched

PLATE

180. Fig. 5. form: No 2. when most contracted, arched, and elevated, preparatory to walking, which it does somewhat in the manner of the larvæ of the Geometra tribe of moths, or as usually described as if measuring the ground like a pair of compasses.

GENUS PLANARIA.

- Fig. 6. *Planaria crenata*. No. 1, 2, 3, 4, 5, shews various positions and contractions of this animal

GENUS SIPHUNCULUS.

- Fig. 7. *Siphunculus nudus*

ORDER MOLLUSCA

GENUS LIMAX.

- Fig. 8. *Limax ater*
 9. *Limax maximus*

GENUS ONCHIDIUM.

181. Lettered VERMES, Order Mollusca, Plate VII.

- Fig. 1, 1. *Onchidium typha*

GENUS LAPLISIA.

- Fig. 2. *Laplisia depilans*

GENUS DORIS.

- Fig. 3. *Doris argo*
 4. *Doris radiata*
 5. *Doris papillofa*

GENUS APHRODITA.

- Fig. 6. *Aphrodita aculeata*. No. 6. † small, upper surface, right-hand figure
 No. 6. † ditto, under surface, left-hand figure
 No. 6. large size
 7. *Aphrodita squamata*

GENUS NAIS.

182. Lettered VERMES, Genus Nais, Plate V.

- Fig. 1, 2, 3, 4. *Nais serpentina*, highly magnified, the natural size being three quarters of an inch in length, or not exceeding that of the cluster shewn on the duckweed, fig. 5.
 5, 6, 7, 8, 9, 10, 11. *Nais vermicularis*, highly magnified, natural size one-tenth of an inch
 12, 13. *Nais proboscidea*, highly magnified, natural size three-fourths of an inch

GENUS ACTINIA.

183. Lettered VERMES, Genus Actinia, Plate II.

- Fig. 1. *Actinia dianthus*
 2. *Actinia cercus*

GENUS HOLOTHURIA.

184. Lettered ZOOLOGY, Class Vermes, Plate I. of Mollusca

- Fig. 1. *Holothuria elegans*
 2. *Holothuria pentactes*

NATURAL HISTORY.

PLATE

184. Fig. 3, 4. *Holothuria fufus*
 5. *Holothuria pennis*
 6, 7, 8. *Holothuria squamata*. No. 1. upper surface : No. 2. lower surface, in a quiet state : No. 3. with the tentacula expanded
 9, 10. *Holothuria inharens*, No. 1. with tentacula expanded : No. 2. tentacula retracted

GENUS SEPIA.

185. Lettered VERMES, Order Mollusca, Plate VI.

- Fig. 1. *Sepia obopus*
 2, 3. *Sepia media*. No. 1. upper surface : No. 2. under surface

GENUS MEDUSA.

186. Lettered VERMES, Order Mollusca, Plate IV.

- Fig. 1, 2. *Medusa pulmo*, No. 1. † upper surface, No. 1. under surface
 3. *Medusa campanula*

GENUS ASTERIAS.

187. Lettered VERMEOLGY, Vermes, Mollusca, Plate III. of Asterias.

- Fig. 1. *Asterias Caput meduse*
 2. *Asterias pectinata*
 3. *Asterias sphaerulata*
 4. *Asterias ophiura*, a upper surface, b under surface

ORDER TESTACEA.

GENUS CHITON.

188. Lettered CONCHOLOGY, Genus Chiton, Plate IX.

- Fig. 1, 2. *Chiton arundo*
Chiton aculeatus, No. 1. upper surface, No. 2. infide
 3. *Chiton squamosus*
 4. *Chiton olivaceus*, No. 1. outside, No. 2. infide, small

GENUS LEPAS.

189. Lettered CONCHOLOGY, Genus Lepas, Plate XIII.

- Fig. 1. *Lepas anatifera*
 2. *Lepas anserifera*

GENUS PHOLAS.

190. Lettered CONCHOLOGY, Genus Pholas, Plate VIII.

- Fig. 1, 2, 3. *Pholas daënylus*, No. 1. side view ; No. 2. the two lateral valves united at the hinge ; No. 3. infide of one of the lateral valves
 4. *Pholas costata*
 5, 6, 7. *Pholas Ariata*, No. 1., the lowest figure, exhibits a side view of this shell, as composed of several valves ; No. 2., the uppermost figure, shews the testaceous valves at the top or hinge side of the shell ; No. 3. the manner in which this species of Pholas buries itself into ships' bottoms or other timber

PLATE

GENUS MYA.

193. Lettered CONCHOLOGY, Genus Mya, Plate XI. B.
 Fig. 1. *Mya truncata*

GENUS SOLEN.

191. Lettered CONCHOLOGY, Genus Solen, Plate (no number)

- Fig. 1. *Solen grandis*, the lowest figure in the plate
 2, 3. *Solen radiatus*, No. 1. outside, No. 2. infide, smaller shell
 4. *Solen frigidulus*
 5. *Solen vagina*, No. 1. outside, No. 2. of a younger shell, shewing the teeth of the hinge
 6. *Solen ensis*

GENUS TELLINA.

192. Lettered CONCHOLOGY, Genus Tellina, Plate V.

- Fig. 1, 1. *Tellina radiata*, No. 1. outside, No. 2. infide (*Donov. Brit. Shells*)
 2, 2. *Tellina squalida*, No. 1. outside, No. 2. infide (*Donov. Brit. Shells*)
 3, 3. *Tellina fabula*, one valve of this Shell is marked externally with very fine oblique subflexuous striae, the other smooth or destitute of striae (*Donov. Brit. Shells*)
 4. *Tellina bimaculata*, infide and outside (*Donov. Brit. Shells*)

GENUS CARDIUM.

- Fig. 5. *Cardium aculeatum*
 6. *Cardium levigatum*
 7. *Cardium edule*
 8. *Cardium medium*

GENUS MACTRA.

193. Lettered CONCHOLOGY, Genus Mya, &c. Plate XI. B.
 Fig. 2. *Mastra radiata*

GENUS DONAX.

- Fig. 3. *Donax trunculus*

GENUS VENUS.

- Fig. 4. *Venus islandica*, No. 1. outside, No. 2. infide

GENUS CHAMA.

- Fig. 5. *Chama Cor*

GENUS SPONDYLUS.

194. Lettered CONCHOLOGY, Genus Spondylus, Plate XVII.

- Fig. 1, 2, 3. *Spondylus gadaropus*. Upper figure on the left hand the usual size ; upper figure on the right side shews the infide of both valves ; the lower figure a superb specimen, in point of magnitude, and perfection of the elongated spines. *Cabinet of Alexander M^cLeay, Esq.*

PLATE

GENUS ARCA.

195. Lettered CONCHOLOGY, Genus Arca, Plate VIII.
 Fig. 1, 2. *Arca tortuosa*, No. 1. outside, lower figure. No. 2. inside
 3, 4. *Arca senilis*, No. 1. the outside, lower figure, No. 2. inside, the upper figure
 5, 6. *Arca nodulosa*, No. 1. outside, lower figure, No. 2. inside
 7. *Arca nebulosa*

GENUS OSTREA.
Pecten, or *Scallops*.

196. Lettered CONCHOLOGY, Genus Ostrea, Plate XII.
 Fig. 1. *Ostrea Jacobæa*
 2. *Ostrea subrufa*
 3. *Ostrea nodosa*
 4. *Ostrea lineata*
 5. *Ostrea obscura*
 6. *Ostrea varia*, various sizes
 7. *Ostrea obsoleta*, nat. size (*Donov. Brit. Shells*)

GENUS MYTILUS.

193. Lettered CONCHOLOGY, Genus Mya, &c. Plate XI. B.
 Fig. 6, 6. *Mytilus edulis*, var. *purpureus*, (*Donov. Brit. Shells*,) inside and outside

GENUS PINNA.

197. Lettered CONCHOLOGY, Genus Pinna, Plate VII.
 Fig. 1. *Pinna nigra*, inside and outside, small size
 2. *Pinna muricata*, shewing the byffus or beard
 3. *Pinna rubra*, ditto
 4. *Pinna fragilis*

UNIVALVES.

GENUS ARGONAUTA.

198. Lettered CONCHOLOGY, Order Univalve, Plate IV.
 Fig. 1. *Argonauta argo*, Paperfailor Shell
 2. *Argonauta vitreus*, called the Glassy Nautilus, a shell of unusual rarity

GENUS NAUTILUS.

- Fig. 3. *Nautilus Pompilius*, Great Nautilus.
 4. No. 1. the largest of the ordinary size ; No. 2. young ; No. 3. section of the young shell, shewing the chambers and the siphunculus

GENUS CONUS.

199. Lettered CONCHOLOGY, Genus Bulla, &c. Plate XI. A.
 Fig. 1. *Conus Ammiralis*, var. *Banded Cedo nulli cone*
 2. *Conus Ammiralis*, var. *Curaçao Cedo nulli cone*
 3. *Conus Ammiralis*, var. *Southern Cedo nulli cone*
 4. *Conus Ammiralis*, var. *Seba's Cedo nulli cone*
 5. *Conus Ammiralis*, var. *Marbled Cedo nulli cone*
 * All these varieties are esteemed valuable : some few bear an excessive price ; that known by the name of Lyonet's Shell was reputed to be worth one hundred pounds sterling, or as it has been otherwise stated a much higher sum. The

PLATE

figure in the upper part of the plate represents the most uncommon kind of Cedo Nulli

GENUS CYPRÆA.

200. Lettered CONCHOLOGY, Genus Cypræa, Plate XIV.
 Fig. 1, 1. *Cypræa tigris*, upper and under surface
 2. *Cypræa aurora*, Aurora or Orange Cowry of the South Seas
 3. *Cypræa argus*
 4. *Cypræa Arabica*
 5. *Cypræa annulata*, upper and under surface
 6. *Cypræa fasciata*
 7. *Cypræa maculata*
 8. *Cypræa vespa*
 9, 9. *Cypræa monetæ*, upper and under surface
 10, 10. *Cypræa pediculus*

GENUS BULLA.

199. Lettered CONCHOLOGY, Genus Bulla, &c. Plate XI. A.
 Fig. 6, 6. *Bulla lignaria*, No. 1. the outside. No. 2., the lower figure, shews the mouth

GENUS VOLUTA.

201. Lettered CONCHOLOGY, Genus Voluta, Plate I.
 Fig. 1. *Voluta tornatilis*
 2. *Voluta porphyria*
 3. *Voluta olivæ*
 4. *Voluta pallida*
 5, 5. *Voluta papalis*, No. 1. the back, No. 2. shews the mouth
 6. *Voluta episcopalis*
 7. *Voluta Æthiopica*
 8. *Voluta indica*

GENUS BUCCINUM.

202. Lettered CONCHOLOGY, Order Voluta, &c. Plate II.
 Fig. 1. *Buccinum harpa*
 2. *Buccinum patulum*
 3. *Buccinum maculatum*
 4. *Buccinum strigillatum*

GENUS STROMBUS.

- Fig. 5. *Strombus chiagra*
 6. *Strombus pugilis*
 7. *Strombus lentiginosus*,
 8. *Strombus urceus*

GENUS MUREX.

203. Lettered CONCHOLOGY, Order Univalve, Plate III.
 Fig. 1. *Murex bouffellum*
 2. *Murex longicauda*
 3. *Murex muricatus*
 4. *Murex tulipa*

GENUS TROCHUS.

- Fig. 5. *Trochus niloticus*
 6, 6. *Trochus perspectivus*. No. 1., right-hand figure, shews the convex surface ; No. 2. left-hand, the concave surface or under side
 7. *Trochus pictus*
 8. *Trochus turritus*

NATURAL HISTORY.

PLATE

GENUS TURBO.

199. Lettered CONCHOLOGY, Genus *Bulla*, &c. Plate XI. A.

- Fig. 7, 7. *Turbo trilineatus*, (*Donov. Brit. Shells*) smallest figure shews the natural size
8, 8. *Turbo fufiformis*, (*Donov. Brit. Shells*) ditto

GENUS HELIX.

Fig. 9, 9. *Helix bortenfs*

GENUS NERITA.

Fig. 10, 10. *Nerita carena*, the figure on the left hand exhibits the carinated umbilicus

GENUS HALIOTIS.

204. Lettered CONCHOLOGY, Genus *Haliotis*, Plate VI.

- Fig. 1, 1. *Haliotis Asinum*. The lower figure shews the outside or upper surface of the shell, as the animal moves; the upper figure exhibits the hollow of the shell, when deprived of the animal
2. *Haliotis tuberculata*
3, 4. *Haliotis spadicæ*, outside and inside
5. *Haliotis lævigata*

GENUS PATELLA.

* *Shell valved within.*

205. Lettered CONCHOLOGY, Genus *Patella*, Plate (blank)

- Fig. 1, 1. *Patella equestris*. The upper figure shews the outside of the shell, which is rugose; the lower one the inside, which is smooth, and furnished with an internal lip or valve in the hollow center
2, 2. *Patella fornicata*. The figure on the left hand exhibits the outside; that on the right hand the inside, with the broad inner lip or valve
3, 3. *Patella striata*. No. 1., the lower figure, shews the striated outer surface; No. 2., the upper figure, the concave hollow beneath, with the inner lip or valve

* * *Shell at the Apex perforated.*

- 4, 4. *Patella fissura*
5. *Patella fissurella*
6. *Patella græca*
7. *Patella radiata*
8. *Patella lobata*
9. *Patella nimbosa*. The upper figure shews the outside surface; the lower one the hollow cavity, or inside

*** *Apex of the Shell entire.*

206. Lettered CONCHOLOGY, Genus *Patella*, Plate XVI.

- Fig. 1. *Patella granatina*. The upper figure shews the outside; the lower one the concave, or inside

PLATE

206. Fig. 2, 2, *Patella Auricula*, two varieties. The figure in the middle of the left-hand margin shews the outer surface; the others the concavity

3. *Patella vulgata*, var.
4. *Patella strigata*
5. *Patella fagittata*
6. *Patella virgata*
7. *Patella anatina*

GENUS DENTALIUM.

207. Lettered CONCHOLOGY, Genus *Dentalium*, Plate (blank)

Fig. 1. *Dentalium elephantium*

GENUS SERPULA.

Fig. 2. *Serpula triquetra*, various examples adhering to a Pecten, (*Ofurea*)

3. *Serpula triquetra*, ditto, adhering to the valve of a *Mytilus*
3. *Serpula vermicularis*, intermixed with *S. triquetra*
4. *Serpula vermicularis*, detached
5. *Serpula filiformis*
6. *Serpula reticulata*
7. *Serpula papillofa*
8. *Serpula tortuosa*
9. *Serpula anguina*
10. *Serpula penis*

GENUS TEREDO.

208. Lettered CONCHOLOGY, Genus *Teredo*, Plate X.

- Fig. 1. *Teredo navalis*, exhibiting the manner in which the timbers of ships' bottoms are sometimes perforated by this destructive creature
2. *Teredo navalis*, a single shell detached from the timber, is shewn at the bottom of the Plate

GENUS SABELLA.

- Fig. 3. *Sabella belgica*
4. *Sabella alveolata*

ELEMENTARY PLATES OF CONCHOLOGY.

UNIVALVES.

209. Lettered CONCHOLOGY, Elementary Plate I.

- Fig. 1, 1, 1. The part denominated the Base of an univalve shell, illustrated by examples selected from different Genera, as in *Dentalium*, *Turbo*
2, 2, 2. the Apex, as in *Dentalium* and *Patella*
3, 3. the Front, as in *Turbo*, *Buccinum*
4, 4. the Back, as in *Turbo*, *Helix*
5, 5. the Sides, as in *Turbo*, *Buccinum*
6, 6, 6. the Body, as in *Helix*, *Murex*
7. the Belly, as in *Nerita*
8. the Whorl, as in *Turbo*
9, 9, 9. the Spire, as in *Turbo*, *Murex*
10, 10. the Sutures of the Spire or Whorl, as in *Murex*, *Turbo*

PLATE

210. Lettered CONCHOLOGY, Elementary Plate II.

- Fig. 11. The part denominated the Pillar or Columella, as in *Murex*
 12, 12, 12. the Aperture, as in *Murex*, *Helix*, *Nerita*
 13, 13, 13. the Lip, as in *Voluta*
 14. the Beak, as in *Murex*
 15. the Canal, as in *Murex*
 16, 16. the Umbilicus, as in *Trochus*, *Nerita*

211. Lettered CONCHOLOGY, Elementary Plate III.

- Fig. 17, 17. The part denominated the Operculum, as in *Trochus*, *Murex*
 18. the Involute Spire, as in *Nautilus*
 19, 19, 19. the Chambers, as in *Nautilus*, the Chambered Patella, and the Ammonite, (found fossil)
 20. the Siphunculus, as in *Nautilus*
 21. the Epidermis, as in *Turbo*

BIVALVES.

- Fig. 22. The part denominated the Base of a Bivalve Shell, as in *Venus*
 23. the Summit, as in *Patella*
 24, 24. the Beak, as in *Chama*, (*Cor.*) *Mytilus*
 25. the Sides, as in *Venus*

212. Lettered CONCHOLOGY, Elementary Plate IV.

- Fig. 26. The part denominated the Margin, or Limb, as in *Tellina*, (cornea)
 27, 27. the Dilk, as in *Venus*, *Tellina*
 29, 29. the Posterior Slope, as in *Macra*, *Tellina*, *Venus*
 30. the Lunule, as in *Venus*, *Tellina*, (a. & b.)
 31, 31. the Cartilage, or Hinge, as in *Tellina*, *Venus*
 32, 32. the Ears, as in *Peëen*, (*Ostrea*, Linn.)
 33, 33. the Ligament Perforation, (Aperture in the upper valve of the Shell through which the ligament of the animal passes, by which it adheres to extraneous substances, as in *Anomia*)

213. Lettered CONCHOLOGY, Elementary Plate V.

- Fig. 34, 34. The Length and Breadth of a Bivalve Shell, as in *Solen*, *Mytilus*
 35. the Infide of a Bivalve Shell, as in *Mytilus*, (*rugosus*)
 36. the Hinge, Suture, and Procefs. Denticulated future, as in *Arca*. Spoon-shaped procefs, as in *Mya*, (*Prætenius*, *Donov.* *Brit. Shells*)

PLATE

213. Fig. 37. The part denominated the Cicatrix, Imprefion of the Spaces to which the animal-inhabitant of the Shell adheres
 38, 38. the Byffius, or Beard, as in *Mytilus*

MULTIVALVES.

- Fig. 39, 39. The part denominated the Base of a Multivalve Shell, as in *Lepas*
 40, 40. the Ligament, as in *Lepas*, (*anatifera*)
 41, 41. the Operculum, as in *Lepas*, (*Balanus vulgaris*)

* * * *Vide article CONCHOLOGY, which these Elementary Plates are intended to illustrate.*

ORDER 4. ZOOPHYTES.

GENUS TUBIPORA.

214. Lettered ZOOPHYTES, Genus Tubipora, Plate I.
 Fig. 1. *Tubipora musica*

GENUS MADREPORA.

* *Consisting of one Star.*

- Fig. 2. *Madrepora fungites*
 3. *Madrepora pileus*
 4. *Madrepora Agathus*
 5. *Madrepora foliaceus*

*** *With numerous united Stars.*

215. Lettered ZOOPHYTES, Plate II.

- Fig. 1. *Madrepora labyrinthica*
 2. *Madrepora phrygia*
 3. *Madrepora gyrata*
 4. *Madrepora areolata*

**** *Aggregated distinct Stars and porous tuberculated prominent Undulations.*

- Fig. 5. *Madrepora ananas*

***** *Ramosæ, with distinct Stars, and tuberculated porous Undulations.*

- Fig. 6. *Madrepora porites*

GENUS ISIS.

216. Lettered ZOOPHYTES, Genus Isis, Plate I.

- Fig. 1. *Isis Hippuris*
 2. *Isis coccinea*

GENUS ANTIPATHES.

- Fig. 3. *Antipathes subpinnata*
 4. *Antipathes Myriophylla*

GENUS GORGONIA.

217. Lettered ZOOPHYTES, Genus Gorgonia, Plate II.

- Fig. 1. *Gorgonia lepadifera*
 2. *Gorgonia ceratophyta*
 3. *Gorgonia americana*
 4. *Gorgonia exseria*

NATURAL HISTORY.

PLATE

218. Lettered ZOOPHYTES, Genus Gorgonia, Plate I.
 Fig. 1. *Gorgonia nobilis*, Red Coral, or Noble Coral
 2. Part of the branch of *Gorgonia Nobilis* magnified, and exhibiting the animals
 3. *Gorgonia umbraculum*
 4. Portion of a branch magnified
 5. *Gorgonia reticulata*
 6. Portion of a branch magnified

GENUS ALCYONIUM.

219. Lettered ZOOPHYTES, Genus Alcyonium, Plate III.
 Fig. 1. *Alcyonium gorgonoides*

GENUS SPONGIA.

- Fig. 2. *Spongia tubulosa*
 3. *Spongia palmata*
 4. *Spongia prolifera*
 5. *Spongia coronata*

GENUS FLUSTRA.

220. Lettered VERMES, Order Zoophytes, Genus Flustra, Plate VIII.
 Fig. 1. *Flustra foliacea*
 2. *Flustra bombycina*
 2.* A portion of a branch magnified to shew the cells
 3. *Flustra carbasæa*
 3.* Magnified to shew the cells
 4. *Flustra verticillata*
 4.* Magnified to shew the cells

GENUS TUBULARIA.

221. Lettered VERMES, Order Zoophytes, Genus Tubularia, Plate I.
 Fig. 1. *Tubularia magnifica*, Magnificent Tubularia, or Animal Flower
 The figures in this Plate display the animal in its young and full-grown state, and exhibit likewise the full expansion of the tentacula

GENUS CORALLINA.

222. Lettered ZOOPHYTES, Genus Corallina, Plate VI. & VII.
 Fig. 1. *Corallina officinalis*
 2. One of the branches magnified
 3. *Corallina squamata*
 4. A branch magnified
 5. *Corallina incrassata*
 6. *Corallina opuntia*
 7. *Corallina corniculata*
 8. A branch magnified

GENUS SERTULARIA.

223. Lettered VERMES, Order Zoophytes, Genus Sertularia, Plate VIII.
 Fig. 1. *Sertularia frutescens*
 1.* A branch magnified

PLATE

223. Fig. 2. *Sertularia quadridentata*
 2.* A branch magnified
 3. *Sertularia pingler*
 3.* A branch magnified
 4. *Sertularia filicula*
 4.* A branch magnified

GENUS HYDRA.

224. Lettered VERMES, Order Zoophytes, Genus Hydra, Plate V.
 Fig. 1. *Hydra viridis*, Green Polype
 2. *Hydra grisea*, Grey Polype
 3. *Hydra fusca*, Brown Polype
 4, 5, 6. Clusters of the different species, as they live at the roots of aquatic plants immersed in water
 * Those marked with a star are magnified.

ORDER V.

INFUSORIA.

GENUS BRACHIONUS.

225. Lettered ANIMALCULES, Class Vermes, Plate I.
 Fig. 1—6. *Brachionus urceolaris*, in various states of expansion and retraction
 7. *Brachionus striatus*
 8. *Brachionus tripus*
 9. *Brachionus uncinatus*
 10. *Brachionus quadridentatus*

GENUS VORTICELLA.

- Fig. 11. *Vorticella polygyna*
 12. *Vorticella polygyna*, a cluster magnified
 13. *Vorticella anastatica*, the group shewing the manner in which they aggregate in clusters; and also figures of the single-headed, double-headed, and quadruple-headed, separate
 14. *Vorticella pyraria*, a cluster
 15. *Vorticella opercularia*, a group, shewing the stelliform animal expanded
 16. *Vorticella umbellaria*
 17. *Vorticella digitalis*
 18. *Vorticella nebulifera*

GENUS TRICHODA.

226. Lettered VERMES INFUSORIA, Plate II.
 Fig. 1, 1. *Trichoda sol*, under two appearances
 2, 2. *Trichoda cometa*, three appearances
 3, 3. *Trichoda bomba*, two appearances
 4. *Trichoda trigona*
 5. *Trichoda anas*
 6. *Trichoda urnula*
 7. *Trichoda proteus*

GENUS CERCARIA.

- Fig. 8, 8. *Cercaria Lemna*, in the entirely expanded position it assumes when moving, and two others
 9, 9. *Cercaria inquieta*, extended and subtracted

PLATE

226. Fig. 10. *Cercaria lupus*
11. *Cercaria podura*

GENUS KOLPODA.

- Fig. 12. *Kolpoda pyrum*

GENUS PARAMECIUM.

- Fig. 13. *Paramecium oviferum*
14. *Paramecium ebryfolis*
15. *Paramecium marginatus*

GENUS VIBRIO.

- Fig. 16. *Vibrio anguillula*
17. *Vibrio glutinis*, the smaller figures denote the natural size
18, 18. *Vibrio anfer*, in two positions
19. *Vibrio olor*
20. *Vibrio lunula*
21, 21. *Vibrio paxillifer*, variously connected

GENUS LEUCOPHRA.

- Fig. 22. *Leucophra cornuta*

GENUS ENCHELIS.

- Fig. 23. *Enchelis punçilifera*
24, 24. *Enchelis retrograda*, two figures
25. *Enchelis truncus*
26. *Enchelis caudata*

GENUS VOLVOX.

- Fig. 27. *Volvox globator*
Obs. All the Vermes infusoria are microscopic objects

Addenda to the Zoology.

227. Lettered LIGHT, Luminous Animals

Luminous Animals, *vide* article LIGHT

- Fig. 1. *Nereis noctiluca*, discovered by Vianelli, (nat. size)

2. The fame, greatly magnified
3. A luminous insect, discovered by Riville
4. *Cancer fulgens*, discovered by Sir Joseph Banks, (natural size)
5. *Limulus noctilucus*, discovered by Captain Horiburgh, greatly magnified
6. *Medusa pullucens*, discovered by Sir Joseph Banks, shewn less than the natural size
7. *Pyrosoma atlanticum*, lately discovered by Peron
8. *Medusa lucida*, of Dr. Macartney, the largest he met with
9. *Beroe fulgens*, of Dr. Macartney, the usual size
10. *Medusa scintillans*, of Dr. Macartney, natural size
11. The fame, highly magnified
12. A luminous Animalcule, discovered by Mr. Forster
13. The fame, highly magnified
14. An enlarged view of the inferior surface of the abdomen in the *Lampyrus lucida*, after the integuments had been removed

PLATE

227. Fig. 14. *a.a.a.* The three masses of luminous substance, which are applied to the three last rings of the abdomen

b.b.b. The arrangement of the cellular or interstitial substance on the other abdominal rings, which give the pale colour to the whole belly of the insect

15. Dissection of the common Glow-Worm, exposing the sacs of luminous matter *in situ*, on the last ring of the belly. *a.* The sac on one side
16. One of the sacs of the Glow-Worm taken out and very highly magnified. *a.* The external part of the sac, composed of an interweaving of a spiral fibre. *b.* The luminous substance seen at one end
17. *Elater noctilucus*, with a portion of the shell of the thorax removed to uncover one of the organs of light, of which there are two, one being situated on each side, at the posterior part of the thorax. *a.* The yellow transparent spot of the thorax. *b.* The oval mass of luminous substance surrounded by an irradiation of the interstitial substance. *c.* The ends of the muscles which are on the inside of the thorax
18. The luminous apparatus of the *elater noctilucus*, considerably magnified. *a.* The radiated appearance of the interstitial substance around the oval mass of luminous substance. *b.* The arrangement of that substance when it passes down between the muscles. *c.* The ends of the muscles of the back. *d.* The shell of the thorax
19. *Elater ignitus*. *a.* The yellow part of the thorax. *b.* The small mass of luminous substance, seen on removal of the shell of the thorax

Obs. The preceding objects were those appointed by Dr. Macartney for the explanation of his article on Luminous Animals, which will be found placed under the leading article, LIGHT.

In addition to those, we have, ourselves, conceived the propriety of introducing another figure of the *Nereis* genus, that of Vianelli being, confessedly, very doubtful. This animal is, therefore, not merely introduced by us as a species highly phosphorescent, under certain circumstances, in common with most others of its tribe, but in order likewise to convey a more accurate idea of the *Nereis* genus, than the figure copied from Vianelli will afford. The species we have introduced, is the *Nereis cærulea* of some authors, sanguinea of others; and is, beyond any doubt, a genuine *Nereis* of the Linnæan System.

The figure by Vianelli, is contained in a small tract written in the Italian language, entitled "*Nuove scoperte intorno le luci notturne dell' acqua marina*;" and which, besides being most evidently depicted from a very mutilated object, is entirely different from that included in the third volume of *Amœnitates Academicæ*, which Linnæus himself gave very shortly afterwards as the same animal: and even this latter, like that of Vianelli, if we mistake not, must have been delineated likewise from

an imperfect animal. We have, indeed, a strong suspicion, that the animal represented by Vianelli, cannot be of the Nereis genus.

In conclusion of this note, it may not be amiss to add, that no animal has been more indefinitely described than the Nereis noctiluca. The only specific character assigned to it in the last edition of *Systema Nature* cura Gmelin, is *Corpore vix conspicuo*, which being applicable to every minor species, can be no criterion of the individual kind that author had intended; and the same vague character occurs again in *Mull. Zool. Prodr.* n. 2623. In the twelfth edition of *Linn. Syst. Nat.* the body of Nereis noctiluca is described as consisting of twenty-three joints, which is the number represented in the Plate inserted in *Amoen. Acad.* t. 3. but this distinction is totally at variance with the subject of Vianelli's tract; for in that figure there are no more than about eleven joints in the body, instead of the twenty-three which Linnæus has described.

BOTANY.

Illustration of the Twenty-four Linnæan Classes, according to the Number of the Stamina.

228. Lettered BOTANY, Plate II.

- Fig. 1. Clafs 1. *Monandria*, one stamen, as in *Salicornia*, *Callitriche*, &c.
 2. *Diandria*, two stamens, as in *Veronica*, &c.
 3. *Triandria*, three stamens, as in *Hordeum*, *Agrostis*, &c.
 4. *Tetrandria*, four stamens, as in *Ilex*, &c.
 5. *Pentandria*, five stamens, as in *Borago*, *Primula*, &c.
 6. *Hexandria*, six stamens, as in *Allium*, *Eriogonum*, *Ornithogalum*, &c.
 7. *Heptandria*, seven stamens. *Tricentalis*, *Difandra*, *Æsculus*, *Petrocarya*, *Pancovia*, and *Jonesia* are of this class
 8. *Octandria*, eight stamens, as in *Epi-lobium*, *Oenothera*, &c.
 9. *Enneandria*, nine stamens, as in *Butomus*
 10. *Decandria*, ten stamens, as in *Sedum*
 11. *Dodecandria*, twelve stamens, as in *Sempervivum*; above twelve, and less than twenty stamens, as in some other genera
 12. *Icofandria*, twenty or more stamens inserted in the calyx, as in *Mespilus*, *Pyrus*, and some other fruit-bearing plants, including *Fragaria*, *Ribes*, &c.

229. Lettered BOTANY, Plate III.

- Fig. 13. Clafs 13. *Polyandria*, many stamens, as inserted into the receptacle or base of the flowers, as *Papaver* (poppy), *Trollius* (great butter-cup), *Ranunculus*, &c.

229. Fig. 14. Clafs 14. *Didynamia*, stamens two long, two shorter, as in *Lanium*, or dead-nettle, &c.
 15. *Tetradynamia*, stamens four long and two shorter, as in *Cheiranthus*, or stock gilly-flower, *Sinapis*, *Braf-fica*, &c.
 16. *Monadelphia*, stamens united by their filaments into a kind of tube, as in *Malva*
 17. *Diadelphia*, stamens united into two distinct parcels or sets, as in *Pisum*, *Lathyrus*, *Ervum*, &c.
 18. *Polyadelphia*, stamens united into more than two distinct parcels or sets, as in *Hypericum* (St. John's wort)
 19. *Syngenesia*, anthers united into a cylinder, flowers compound, as in *Leontodon* (dandelion), &c.
 20. *Gynandria*, stamens united with or growing out of the petals, as in *Orchis* (bee-flower)
 21. *Monoecia*, stamens and pistils in separate flowers on the same plant, as in *Zinnichellia*, *Cbara*, &c.
 22. *Diecica*, male and female flowers on distinct plants, as in *Salix*, the willow
 23. *Polygamia*, male or female flowers, or both, with hermaphrodite flowers on the same or on different plants, as in *Valantia*, *Brabeium*, *Parietaria*, &c.
 24. *Cryptogamia*, fructification concealed, or not distinctly ascertained

Illustration of the Linnæan Orders of Botany, as established upon the Number of the Pistils.

230. Lettered BOTANY, Orders, Plate IV.

- Fig. 1. *Monogynia*, one style or stigma (with five stamens), as in a most extensive number of plants, among which are *Heliotropium*, *Anchusa*, *Borago*, &c.
 2. *Digynia*, two styles (with ten stamens), as in *Chrysoplenium*, *Metella*, *Scleranthus*
 3. *Trigynia*, three styles (with ten stamens), as in *Silene*, *Stellaria*, &c.
 4. *Tetragynia*, four styles, with four stamens, as in *Ruppia*, *Potamogeton*, *Sagina*, &c.; with five stamens, as *Parnassia*, &c.; with six stamens, as in *Peiveria*
 5. *Pentagynia*, five styles (with ten stamens), as in *Oxalis*, *Suriana*, *Lycbis*, &c.
 6. *Hexagynia*, six styles, as in *Butomus*
 7. *Heptagynia*, seven styles (with seven stamens), as in *Septas*
 8. *Decagynia*, ten styles (with ten stamens), as in *Neurada* and *Phytolacca*
 9. *Dodecagynia*, twelve styles (with twelve stamens), as in *Sempervivum*
 10. *Polygamia*, many styles, as in the 1st. 2d. 3d. and 4th. order of Clafs Syngenesia
 11. *Gymnospermia*, naked seeds, as in *Ajuga*, *Tetrarium*, *Saturgia*, &c.

230. Fig. 12. *Angiospermia*, seeds inclosed in a pericarpium or seed-vessel, as in many genera, *Anterrhinum*, *Cybaria*, &c.

231. Lettered BOTANY, Orders, Plate V.

- Fig. 13. *Siliculosa*, pericarpium a filicula, as in *Thalassia* (shepherd's purple), *Draba*, &c.
14. *Siliquosa*, pericarpium a siliqua, as in *Rapbanus*, *Sinapis*, *Brassica*, &c.
 15. *Polygamia Aequalis*, flowers compound, all the florets hermaphrodite, as in *Leontodon*, *Hieracium*, &c.
 16. *Polygamia Superflua*, florets of the disk hermaphrodite, those of the radius female, as in *Bellis* (garden daisy), *Tussilago*, *Senecio*, &c.
 17. *Polygamia Necessaria*, flowers or florets of the disk male, those of the radius female, as in *Calendula*, *Chrysogonum*
 18. *Polygamia Frustranea*, florets of the disk hermaphrodite, those of the radius neuter, as in *Centaurea*, *Sclerocarpus*, *Rudbeckia*
 19. *Polygamia Segregata*, many partial cups contained in the common calyx, which separate and surround the floscula, as in *Echinops*, *Gundelia*, *Spheranthus*, &c.
 20. *Trioccia*, have the polygamy or parts of fructification on three different plants, as in *Ficus*, and also *Cerantia*
 21. *Felices*, fructification dorsiferous (on the back of the leaf), as in *Asplenium*, *Adiantum*, *Trichomanes*, &c.
 22. *Musci*, anthers without filaments; female flowers distinct and without pistillum: seeds a naked corculum without cotyledon or tunic. With or without a calyptra or veil, as in *Bryum*, *Hypnum*, *Buxbaumia*, &c.
- Obs.* To the order Musci, Gmelin and other botanists add the following (*Hepaticæ*), comprehending *Marchantia*, as the last genus of Musci after *Jungermania*. Linnæus had left it with *Alge*
23. *Hepaticæ*, herbage frondose in general, the fructification originating from what is at the same time both stem and leaf, as in *Marchantia*, *Jungermania*, &c.
 24. *Alge*, root, stem, and leaf, in one, as *Fucus*, *Ulva*, *Lichen*, &c.
 25. *Fungi*, mushrooms, as in *Agaricus*, *Boletus*, &c.

CLASS CRYPTOGAMIA.

Addenda to the Musci, in Illustration of the Fringes of Mosses.

* Furnished with single Fringes.

232. Lettered BOTANY, Plate Fringes of Mosses.

- Fig. 1. *Tetraphis*. Fringe of four teeth, as in *Mnium pellucidum*. These are erect, acute, firm, polished, and permanent
2. *Ooblepharum*. Fringe of eight teeth, as in *Bryum albidum*. Capsule without an apophysis
 3. *Splachnum*. Fringe of 16 teeth, dilated at the base, approaching each other in pairs.

232. Fig. 4. *Encalypta*. Fringe of 16 linear upright teeth. Veil ample and bell-shaped

5. *Pterogonium*. Fringe of 16 linear upright teeth. Capsule from a lateral sheath
6. *Grimmia*. Fringe of 16 equi-distant teeth, dilated at the base. Veil cylindrical
7. *Conostomum*. Fringe of 16 tapering teeth, approaching each other in pairs, and all cohering at the points, as in *Bryum tetragonum*, Dickson, *Grimmia conostoma*, Smith Engl. Botany
8. *Dicranum*. Fringe of 16 flat, somewhat inflexed teeth, cloven half-way down
9. *Trichostomum*. Fringe of 32 linear straightish teeth, approaching each other in pairs, sometimes joined at the base in pairs
10. *Tortula*. Fringe of numerous linear teeth, spirally and repeatedly twisted together
11. *Syntrichum*. In some species of *Tortula* the teeth are united into a cylinder at the base, pierced with numerous holes, upon which some recent botanists have founded this new genus

** The following Genera are furnished with a double Fringe, some few Species of *Orthotrichum* and one of the *Buxbaumia* perhaps excepted.

Fig. 12. *Orthotrichum*. Capsule terminal. Outer fringe of 16 teeth; inner of 8 or 16 linear ones, sometimes altogether deficient. Veil furrowed

Obs. The fringe is sometimes variable. *Orthotrichum pumilum* has but eight teeth in the outer fringe.

13. *Nekera*. Capsule from a lateral scaly sheath. Outer fringe of 16 teeth; inner of 16 capillary ones. Veil naked and even
 14. *Funaria*. Capsule obovate. Outer fringe of 16 oblique teeth, cohering at the points; inner, of 16 flat teeth. Veil quadrangular
 15. *Buxbaumia*. Capsule oblique, gibbous on one side. Outer fringe of 16 very short teeth; inner, membranous and plaited
- Obs.* In *Buxbaumia foliosa* the outer fringe is scarcely perceptible; it is represented at fig. 16.
17. *Bartramia*. Capsule spherical, furrowed. Outer fringe of 16 awl-shaped teeth; inner, membranous, lacinated. Lip depressed
 18. *Mnium*. Capsule terminal, cylindrical, furrowed. Outer fringe of 16 awl-shaped teeth; inner, membranous, lacinated
 19. *Bryum*. Capsule ovate-oblong, smooth. Outer fringe of 16 teeth, dilated at the base; inner, membranous, toothed. Flowers terminal
 20. *Hypnum*. Capsule ovate-oblong, from a lateral scaly sheath. Outer fringe of 16 teeth, dilated at the base; inner, membranous, variously toothed. Veil smooth
 21. *Fontinalis*. Capsule enveloped in a lateral scaly sheath. Outer fringe of 16 teeth, dilated at the base; inner reticulated
 22. *Polytrichum*. Outer fringe of 32 or 64 flat inflexed teeth; inner, a transverse orbicu-

PLATE

lar membrane, affixed to the teeth of the outer. Veil mostly double; the outer hairy

Vide article FRINGE of MOSSES, by Sir J. E. Smith.

CLASS CRYPTOGAMIA.

Addenda in Illustration of the Genera of Fungi.

233. Lettered BOTANY, Fungi, Plate I.
Fig. 1. Genus *Agaricus*
234. Lettered BOTANY, Fungi, Plate II.
Fig. 1. Genus *Merulius* (*eburneus*)
233. Lettered BOTANY, Fungi, Plate I.
Fig. 2. Genus *Boletus*
3. *Hydnum*
4. *Clavaria*
5. *Phallus*
6. *Clathrus*
7. *Helvella*
8. *Peziza*
234. Lettered BOTANY, Fungi, Plate II.
Fig. 2. Genus *Cyatbus*
233. Lettered BOTANY, Fungi, Plate I.
Fig. 9. Genus *Lycoperdon*
234. Lettered BOTANY, Fungi, Plate II.
Fig. 3. Genus *Sphæria* (*digitata* and *bombardica*)
4. *Tuber*
5. *Rhizomorpha* (*phosphorea*)
233. Lettered BOTANY, Fungi, Plate I.
Fig. 10. Genus *Mucor*
* The preceding are Linnæan genera in the Gmelinian *Système Nature*, including the *Fungi* genera of the 12th edit. Linn., with others selected by Gmelin from Perfoon, Willdenow, Tode, and other writers on this tribe of Cryptogamia. To these the contributor of the article FUNGI for this Cyclopædia has added the following genera:
234. Lettered BOTANY, Fungi, Plate II.
Auricularia (*reflexa*)
Nidularia (*campanulatus*)
Trichia (*denudata* and *nuda*)
Uredo (*figetum*), known in agriculture by the name of *smut*
Æcidium (*anemones*)

BOTANICAL ARRANGEMENT OF TOURNEFORT.

* *Section, Herbaceous Plants and Under-ferubs.*

† *Petalled.*

- A. † *Flowers Simple, Monopetalous, Regular.*
235. Lettered Tournefort's Syst. Botany, Plate I.
No. 1. Clafs 1. *Bell-shaped*, as in *Belladonna*, *Campanula*, and *Convolvulus*. Letter a

PLATE

denotes the flower, *b* the fruit, *c* the seeds, in the dissections of the different plants intended to illustrate these classes

- 235 & 236. Lettered Tournefort's Syst. Botany, Plate II.
No. 2. Clafs 2. *Funnel-shaped*, as in *Borago* (*officinalis*) *Solanum dulcamara*, &c.:
a the flower, *b* the fruit, *c* the seeds
- † † *Simple, Monopetalous, Irregular.*
236. No. 3. Clafs 3. *Personate*, as in *Arum*
a the flower, *b* the fruit, *c* the seeds
236. No. 4. Clafs 4. *Labiata*, as in *Salvia*, *Lamium*, *Thymus*
a the flower, *b* the fruit, *c* the seeds
- † † † *Simple, Polypetalous; Regular.*
237. Lettered Tournefort's Syst. Botany, Plate III.
No. 5. Clafs 5. *Cruciform*, as in *Raphanus* (*Raphanistrum*)
Thlaspi (*Bursa Pastoris*) *Chelidonium* and *Potamogeton*
a the flower, *b* the fruit, *c* the seeds
237. No. 6. Clafs 6. *Rosaceous*, as in *Rosa*, *Nymphaea*, *Hypericum*
a the flower, *b* the fruit, *c* the seeds
238. Lettered Tournefort's Syst. Botany, Plate IV.
No. 7. Clafs 7. *Umbellatæ*, as in *Phellandrium*, *Foeniculum*
a the flower, *b* the fruit, *c* the seeds
8. 8. *Caryophyllous*, as in *Caryophyllus*
a the flower, *b* the fruit, *c* the seeds
9. 9. *Liliaceous*, as in *Crucis*, *Narcissus*
a the flower, *b* the fruit, *c* the seeds
- † † † † *Simple, Polypetalous, Irregular.*
239. Lettered Tournefort's Syst. Botany, Plate V.
No. 10. Clafs 10. *Papilionaceous*, as in *Pisum*, *Ervum*, &c.
a the flower, *b* the fruit, *c* the seeds
11. 11. *Anomalous*, as in *Aquilegia*
a the flower, *b* the fruit, *c* the seeds
- B. † *Flowers Compound, Polypetalous, Irregular.*
239. No. 12. Clafs 12. *Florescous*, as in *Echinopus*
a the flower, *b* the fruit, *c* the seeds
13. 13. *Semi-florescous*, as in *Leontodon*
240. Lettered Tournefort's Syst. Botany, Plate VI.
No. 14. Clafs 14. *Radiata*, as in *Helianthus*, *Aster*
a the flower, *b* the fruit, *c* the seeds
- † *Apetalous (without petals).*
15. 15. *Apetalous Stamiferous*, as in *Avena*
a the apetalous flower, stamen-bearing calyx, or stamiferous organ, *b* the fruit, *c* the seed

PLATE

241. Lettered Tournefort's Syft. Botany, Plate VII.
 No. 16. Clafs 16. *Apetalous feminiferous*, as in *Felix, Lichen, &c.*
a the feminiferous organs, (theſe having, according to Tournefort, no flowers,) *b* the fruit, *c* the feed
 17. 17. *Apetalous, without apparent fruit*, as in *Fungi, Muſci, &c.*
 * * Section Trees and Shrubs.
 † *Apetalous (without petals).*
Irregular.
 No. 18. Clafs 18. *Apetalous*

242. Lettered Tournefort's Syft. Botany, Plate VIII.
 No. 19. Clafs 19. *Amentaceous*, as in *Quercus, Pinus, &c.*
 † *Petalid.*
Irregular.
 No. 20. Clafs 20. *Monopetalous*, as in *Heydyfarum*
Regular.

243. Lettered Tournefort's Syft. Botany, Plate IX.
 No. 21. Clafs 21. *Rofaceous*, as in *Rubus.*
 22. 22. *Papilionaceous*, as in *Pifum, Colutea, &c.*

Obf. The importance of the Syftem of Tournefort, the outline of whoſe claffification is here laid down, will be beſt underſtood by thoſe who are aware of the attachment of the French botaniſts, even of the lateſt times, to the method of this early author: a botaniſt, whoſe labours preceded thoſe of Linnæus by nearly half a century.—It has been truly obſerved, that Tournefort is to the French in the ſcience of botany, the foundation-ftone upon which all their ſyſtems are eſtabliſhed. This predilection in favour of their own ſyſtems, to the excluſion of that the Swediſh naturaliſt founded upon the ſexual organs of plants, may yet have its revolution; but that in the preſent time is more than can be well expected. As the botanical department of this Cyclopædia has been almoſt from the commencement allotted to one of the moſt able profeſſors in the ſcience, it is very far from the intention of the writer of the preſent article to enter into the comparative merits of the prevailing ſyſtems of this time, the Linnæan in Britain, under the auſpices of its many learned advocates, and that of the French, founded on a “natural method” not very diſſimilar from that of Tournefort, and as improved by Juſſieu and Gærtner. We only wish to offer ſome apology for the greater number of plates devoted to the ſyſtem of the celebrated corollift M. Tournefort than to the ſexual ſyſtem of Linnæus; the latter being a naturaliſt whom from adoption we may almoſt deem our own, and we muſt confeſs with all his imperfections our moſt favourite author.

The great talents of one of our ableſt and moſt experienced botaniſts at this period, we are well aware have been directed to the advancement of a “natu-

PLATE

ral method* ;” perhaps even we might be almoſt juſtified in terming him one of the great ſupporters of this method, not in this country alone but throughout Europe: while the labours of Juſſieu, Jaume St. Hilaire, and others, have gone far towards the formation of a method conſtructed upon the natural affinities of plants, and on their fruits and feeds eſpecially; characters which, with the corolla, calyx, and other organs of the flower conſidered generally, it will be perceived had formed the baſis of that ſyſtem which was laid down by Tournefort.

After what we have advanced upon this intereſting ſubject, it might have been thought adviſable to appropriate other plates to the elucidation of what is underſtood by a natural method; but that, alas! would be impoſſible. Much remains undone, and it is only by a very long and arduous courſe of reſearch and investigation that any ſyſtem of material extent founded on that method is to be expected. “Hitherto,” ſays M. de Candolle, one of its moſt popular promoters, “we have arrived only at the baſis of this ſyſtem, and not at the reſult: it exiſts rather in the converſations of botaniſts than in their books, and remains yet among the number of thoſe opinions which Bacon calls floating.” *Vide De Candolle de Taxonomie.* Under theſe circumſtances, the plates appropriated to the illuſtration of Tournefort's arrangement of Botany will not be thought devoid of intereſt, and may be indeed conſidered of material uſe to the early botaniſt as well as general reader, in unison with thoſe intended for the illuſtration of the claſſes and orders of Botany as laid down and eſtabliſhed by the great Linnæus.

VEGETABLE ANATOMY.

244. Lettered VEGETABLE ANATOMY, Plate I.

Fig. 1—8. Diſſections of the cortex or bark of various plants, of the natural ſize and magnified, deſigned to ſhew the ſtructure of the layers of which they are compoſed, &c.

245. Lettered VEGETABLE ANATOMY, Plate II.

Diſſections explanatory of the diſpoſition of the layers which appear internally in the ſtems or branches: fig. 1, 2, 3. horizontal ſections; fig. 4, 5. perpendicular ſections; fig. 6, 7, 8. ſhew the longitudinal diſpoſition of the veſſels upon ſtripping off the outer bark or cortex

Fig. 9—13. Various appearances and diſſections of the buds of plants. Fig. 14—17. of the flower, &c.

19. A bulbous root, ſhewing the exterior imbrications
 18. A horizontal ſection of a bulbous root, ſhew-

* Robert Brown, Eſq. who, without rejecting the ſexual organs as uſeful auxiliaries, regards more particularly the germination of plants, with the number and form of the Cotyledons, as eſſentially characteristic in a ſyſtem founded on a natural claffification.

PLATE
245.

ing the concentric layers of which it is composed

Fig. 20. Perpendicular section of a bulbous root

MINERALOGY.

246. Incribed NATURAL HISTORY, Plate I.

View of Mount Ætna, from Spallanzani's Work.
This is a general view of Mount Ætna, the adjacent country and the sea; and is intended to shew the effects occasioned by the eruption of the volcanic matter at different times. A points out the loftiest summit of the Mount. H is Nicolofi, and marks the Mount Rosso or Red Mountain, formerly a plain, but in 1699, a new vertex opened in it, and discharged the dreadful torrents of lava which overflowed the land, till reaching the sea, it formed the promontory of lava in the sea extending as far as letter Y. G, near this new opening of Ætna, is the mountain Montpelieri or Montpileri
Various other interesting spots are marked in the plate, for which consult the article ÆTNA, *Mount.*

246. Incribed NATURAL HISTORY, Plate II.

A View of the Crater of Mount Ætna.
A A A One edge of the lava of 1787, which issued from the upper crater. B B B the circumference of the crater, with its cleft C C through which the internal part is discernible. D the flat bottom of the crater. E the aperture in the bottom through which the larger column of smoke F F arose. G G is that part of the edge of the crater from which its internal part is best seen. H H is the smaller column of smoke to the north-east. *vide article Mount ÆTNA for further explanation*

247. Incribed NATURAL HISTORY, Plate V.

View of Mount Vesuvius, as seen from the Bay of Naples. From an original sketch made in the year 1797, by R. Duppa, Esq.

248. Incribed NATURAL HISTORY, Plate IV.

View of the Crater of Mount Vesuvius. Drawn by the same hand, and at the same time as the preceding.

249. MINERALOGY, Plate II.

Basalt. The Mountain of Aïfa, called La Coupe, or the Col d'Aïfa, near the village Entrague, in the Viverrais, above the torrent of Volant

This plate affords an example of the formation of basaltic columns, and illustrates the hypothesis of the Huttonian system, according to which the basaltic matter has been originally of volcanic origin, and while in a state of fusion cast out of the crater of the mountain. In its progress this lava has formed a wavy channel down the mountain side. According to St. Fond, this is the most remarkable and best characterized crater in all the Viverrais. The ends of the columns may be distinctly seen before the basalt reaches the river.

GEOLOGY.

250. GEOLOGY, Plate I.

Fig. 1. The upper figure in this Plate exhibits the

PLATE

dip, dyke, fault, slip, trouble, &c. described and referred to in the article COAL

251. GEOLOGY, Plate II.

Fig. 1—10. Sections of various Strata

252. GEOLOGY, Plate III.

Fig. 1. *Strata*: being a sketch of the arrangement of the strata through England, by Mr. R. Bakewell. Lat. $54^{\circ} 35'$ to $54^{\circ} 45'$.
2. Section of the strata through part of Dorsetshire and Devonshire, by Mr. R. Bakewell
3. Perpendicular strata
4. Horizontal strata
5. Inclined strata, consisting of greywacke, clay-slate, compact felspar, porphyry, sienite, trap, clink-stone and granite, valley of Long Sleddale, Westmoreland
6. Undulate strata: shewing the wavy structure of the beds of slate, called shillet, in Devonshire

253. GEOLOGY, Plate IV.

Fig. 1, 1. Metallic veins exemplified, with a " rider," &c.; and also the interfection (or " cutting-off") of metallic veins
2. Columnar and amorphous basalt, intersected by basaltic dykes
4. Lime-stone broken and inclosed in basalt, seen in a basaltic rock on the coast of Antrim
Whinstone dykes, or basaltic veins, passing through chalk, and changing it into marble—under figure 4.
(See article GEOLOGY. *Suppl.* Vol. XXXIX.)

Addenda to the Geological Illustrations.

254. Plate ICHTHYOLITE, or Ichthyological Remains.

Mineralized remains, or impressions of fishes, on black shistose slate, found at Ilseben, in Germany

255. FOSSILS, Extraneous, Plate I.

Fig. 1. Mineralized remains of an encrinurus, Encrinurus liliiformis, or " itone lily," in relievo, on a slab of stone
2. Transverse section of the lily-head
3. The lily-head half broken through transversely
4. Bottom of the lily-head, shewing the peduncle by which it is connected to the main stem of the encrinurus

CRYSTALLOGRAPHY.

256. Lettered CRYSTALLOGRAPHY, Plate I.

Fig. 1—7. Various forms of the crystals of adamantine spar
8—16. Ditto of felspar

262. Lettered CRYSTALLIZATION, Plate VII.

Fig. 27. The *Octohedron*, regularly formed
13. The *Tetrahedron*, regularly formed

PLATE

262. Fig. 5. The *Hexabedral prism*, or equiangular six-sided prism
 12. The *Rhomboidal dodecahedron*
 14. The *Pyramidal dodecahedron*, or double six-sided pyramid

257. CRYSTALLOGRAPHY, Plate II.

Fig. 17—21. Mechanical dissection of a *hexabedral crystal of calcareous spar*, and extraction of the primitive crystal, or nucleus

Obf. Lettered fig. 17—21. Plate II. *Crystallography. Described in article CRYSTAL, Vol. X. Part II. but erroneously referred to as fig 1—5. Plate I.*

22, 23. Mechanical division of the *dog's-tooth spar*, erroneously fig. 6, 7. Plate I.

Fig. 24. *Rhomboids of calcareous spar*, a secondary crystal, with the primitive nucleus

260. CRYSTALLOGRAPHY, Plate V.

Fig. 56. The base of the *six-sided prism*, divided by sections parallel to each of its sides, and producing the *triangular prism*, the ultimate form obtained by mechanical division

259. CRYSTALLOGRAPHY, Plate IV.

Fig. 48, 49. The *cube* divided by sections parallel to the sides, and producing a series of smaller cubes, considered as the form of the integrant molecule

257. CRYSTALLOGRAPHY, Plate II.

Fig. 26. The *primitive rhomboid* of the tourmaline, with its dissection. This crystal is divisible both in the direction of the six faces, and in that of the short diagonals; by which latter sections the rhomboid is reduced to six tetrahedrons, surrounding the nucleus, as here represented

Decrements of the Edges of the Crystals.

257. & 258. CRYSTALLOGRAPHY, Plates II. & III.

Fig. 27, 28. The *rhomboidal dodecahedron*, which figure may be formed from a cubic nucleus, by the superposition of decreasing laminae

258. CRYSTALLOGRAPHY, Plate III.

Fig. 29. Congeries of cubes, consisting of integrant molecules, forming the cubic nucleus, with the pyramids raised on three of the faces

257. CRYSTALLOGRAPHY, Plate II.

Fig. 27. The form of the crystal, produced by the combination of these integrant molecules, when complete

Decrement in Breadth and Height.

258. CRYSTALLOGRAPHY, Plate III.

Fig. 30. A crystal of *iron pyrites*, with twelve pen-

PLATE

258.

agonal faces, in which the two kinds of decrement are combined

Fig. 31. The cubic nucleus of this variety is shewn

32. The formation of the crystal by decrements

33. Decrement of the *dog's-tooth spar*, (the metallic crystal of Haüy,) represented complete in Plate 257. fig. 22. The present figure supposes the hypothesis of a decrement by two ranges in breadth. It represents the upper pyramid of this crystal placed on the upper planes of the primitive nucleus, which being partly visible, discloses more clearly the progressive effects of the decrement by two ranges

34. A secondary crystal, which is a rhomboid much more obtuse than the nucleus, is represented as surrounding the nucleus in the variety of calcareous spar, called by Haüy, *equiaxe*

The nucleus (supposed to be the primitive rhomb of carbonate of lime) progressively dissected to explain its structure

The face at letter A, fig. 35, shews the same face of the rhomb as is represented in fig. 34, but symmetrically divided, and the figure shews the gradual division of the rhomb, by mechanical separation down to letter I d

258. CRYSTALLOGRAPHY, Plate III.

Fig. 36. *Decrements on the angles of a crystal*, shewn in the regular *octohedron* formed on a cube

259. CRYSTALLOGRAPHY, Plate IV.

Fig. 37. The arrangement of the integrant molecules on one of the triangular faces of the octohedron

259. CRYSTALLOGRAPHY, Plate IV.

Fig. 38. Rhomboid crystal

39. Another example of the decrements on the angles, exemplified in the dissection of the *rhomboid*, fig. 38., which differs somewhat from that of the cube, producing a very obtuse rhomboid, encircling the nucleus; found among the secondary crystals of oligite iron ore

Further illustration of the different variations, of which the decrements of the *rhomboid*, both of the superior and inferior angles, are susceptible. The rhomboid is shewn at fig. 45.; the dissections at fig. 46, 47.

Intermediate Decrements.

Fig. 48. A parallelepiped undergoing a decrement, by two ranges on the angle of its base

49. A crystal, in which all the three decrements round the same solid angle are intermediate

50. Another example of intermediate decrement in one of the faces of a cubic nucleus, taking place on the angles, by the subtraction of double molecules

51. The cubic nucleus, marking the decrements parallel to the lines *k m*, &c. by subtraction

tion of double molecules, in such a manner as that three ranges be taken away in the breadth, and one in height; so that the decrements will be both intermediate and mixed

52. A polyhedral crystal of thirty faces, produced by the cessation of decrementation, before the formation of the pyramid round each face of the nucleus
53. Example of intermediate decrements on the two lateral angles of a rhomboid, (as at fig. 47.), the decrements taking place by ranges of double molecules, producing in the complete result a solid of twelve faces, disposed six and six towards each summit, as in one variety of calcareous spar, or double-pointed dog's-tooth spar

Compound secondary Forms of Crystals.

- Fig. 54. A secondary crystal, an *icohedron* bounded by eight equilateral triangles, and twelve isosceles triangles. Occurs in iron pyrites
55. A calcareous spar (*Analogique* of Häüy), composed of twenty-four trapezoidal faces, six of which are vertical, and twelve others disposed six and six. The different trapezoidal faces are shewn in the figure

260. CRYSTALLOGRAPHY, Plate V.

- Fig. 56. The end of the regular six-sided prism, which, for its molecule, presents us with the triangular, or three-sided prism
57. A cubic nucleus divided into its cubic molecules
59. Superior face of the second lamina, A Ditto, further mechanical division of the integrant molecules, B Ditto, ditto, C
58. Explanation of vacancies on the edges of a crystal, given by Häüy
60. An oblique prism with rhomboidal bases, so situated that the faces A D, *ad*, and C D, *cd*, are vertical; and B D are the acute angles of the base, and that the latter proceed in an ascending direction from A to C
Intersect this prism into halves, by means of a plane passing by the diagonals, drawn from B to D, and from *b* to *d*, so that the half situated on the left remaining fixed, the other is reversed without being separated, and the figure presented will be as shewn at fig. 61.
62. Another example of grouping, in which crystals are inserted into each other, is extremely common. This combination is illustrated by a cube, and M N r, an equilateral triangular facet, produced by a decrement of one range round the angle A
63. A second cube modified in the same manner, and affixed to the other by its correspondent facet, will afford the double crystal represented

To illustrate the Notation of Crystals.

- Fig. 64. Represents an oblique parallelepiped, the faces of which have angles of different measures
65. The effect of decrement shewn
66. An oblique parallelepiped
67. Primitive molecules
68. BINARY felpar of Häüy
69. Primitive form of a rectangular prism, which has oblique-angled parallelograms for its bases, one of which is longer
70. The oblique prism, with rhomboidal bases
71. The rectangular prism, with rectangular bases
72. The rectangular prism, with rhomboidal bases
73. The rectangular prism, with square bases
74. The cube
75. The most common variety of chrysoberyl, or cymophane, the nucleus of which is a regular parallelepiped, as represented at fig. 71.
76. The prism

261. CRYSTALLOGRAPHY, Plate VI.

- Fig. 77—84, &c. Several figures inserted to illustrate the manner in which the symbols employed in the definition of the various modifications of crystals, by Häüy, and other crystallographers are expressed
80. Octohedron, with scalene triangles
81. Octohedron, another variety
82. The regular octohedron
- 83, 84. The primitive octohedron, composed of eight isosceles triangles similar, four and four each
85. The tetrahedron when become a primitive form
86. The regular six-sided prism
87. The same, in which three solid angles, taken alternately, are replaced by faces, whilst the intermediate angles remain untouched
88. Rhomboidal dodecahedron, in which each solid angle is composed of three planes, and may be assimilated to a summit of the obtuse rhomboid
89. Primitive form of the tourmaline
90. One variety of the tourmaline

Supplemental Plate, lettered CRYSTALLIZATION, Plate VII.

262. CRYSTALLIZATION. See MINERALOGY, Appendix.

- Fig. 1. Cube
2. Rhomb
- 3—5. 29. Varieties of the Prism
6. Pyramid
- 7, 8. Table
9. Icohedron
10. Pentagonal Dodecahedron
11. Lens
12. Rhomboidal Dodecahedron
13. Tetrahedron
14. Double six-sided Pyramid

PLATE

262. Fig. 27. Regular Octohedron
 16. *Truncation* on the angles
 17. on the edges
 18. *Bevelment* on all the edges
 19. 30. on all the lateral edges
 28. on the angles
 Acumination, the acuminating planes
 20. at each angle let on the lateral planes
 21. 26. on the lateral edges
 22. 24. on the lateral planes
 23. on the lateral angles
 25. on the alternating lateral planes
 29. double eight-sided pyramid, four planes at each extremity set on the alternate lateral edges
 31. double six-sided pyramid, with the planes joined obliquely, or metallic crystal

The primitive Forms of Crystals are,

- Fig. 1. The Cube
 2. Rhomb
 7, 8. Rectangular Table
 27. Octohedron
 13. Tetrahedron
 5. Hexagonal Prism
 12. Rhomboidal Dodecahedron
 14. Dodecahedron with triangular faces

The integrant Molecules are,

- Fig. 13. The Tetrahedron
 29. Trihedron
 1. Cube

Instruments employed in the Study of Crystallography and Mineralogy.

261. Fig. 91. Nicholson's instrument for determining the weight or specific gravity of solid bodies
 92. B. An instrument for determining the electricity of minerals
 92. A. An instrument for determining the electricity of the tourmaline
 93. Goniometer for measuring the angles of crystals
 (*Vide MINERALOGY, Appendix, Vol. XXXIX. —Vide also article CRYSTAL, Vol. X.; and CRYSTALLIZATION, Supplemental Vol.*)

Appendix to Geology, Mineralogy, Mining, &c.

263. Plate MINERALOGY, MINING.
 Fig. 1—10. Mining—construction of the shaft or passage leading to mines, mode of descent, manner of closing or stopping them up, &c.
 253. Represented on Plate IV. GEOLOGY.
 Fig. 6. Plan of a Coal Mine, and mode of ventilating
 250. Mining Lamps, Plate I. GEOLOGY.
 Fig. 5, 6. Sir Humphrey Davy's Wire Gauze

PLATE

- Safety Lamp, as made by Mr. Newman, Life Street, Leicefter Square
 (*See WIRE GAUZE*)
 250. Fig. 2, 3. Dr. Clanny's Safety Lamps
 4. Steam Safety Lamp

* * * By attending to the above classification, the whole of those Plates of Natural History, which the proprietors have allotted to this Cyclopædia, may be readily reduced to numerical order, and be by that means, it is presumed, more easily distinguished when required for reference than by the original plan, in which the plates of each section were lettered separately from the rest. They now follow each other, not only in numerical order throughout their whole extent, but also in the order of the Linnæan System, as nearly as the number of plates appropriated to the respective Sciences would conveniently allow. The miscellaneous nature of some few plates, which it has been lately thought desirable by the proprietors to introduce, renders it impossible to place them strictly in the order of system.

ERRATA

ON THE

PLATES OF NATURAL HISTORY.

Some few errors having been committed by the writing engravers in lettering the names upon the plates of Natural History, which it will be very desirable to correct, the reader is requested to observe, that wherever the names upon the plates are found at variance with those inserted in this printed index, the preference is to be invariably given to the latter; and that the names upon the plates may be corrected by a reference to this index. The following errors occur to us in passing over the plates for the purpose of composing the present classification.

QUADRUPEDS.

19. For Brasilian Weefel, read Brasilian Weefel
 26. Taguan Squirrel, r. Taquan S.
 29. Mospymæus, r. Mos pygmæus
 31. Antilope Grümmea, r. Ant. Grimmia

BIRDS.

46. For Ramphastos Aracani, read R. Aracari
 G. Crotophagi, r. G. Crotophaga
 52. Merops Novæ Zelandiæ, r. Novæ Selandiæ
 53. Certhia coccinea, r. C. coccinea
 Certhia cærulea, r. C. cærulea
 54. Anas Olot, r. A. Olor
 56. Anas Creca, r. A. Crecca
 Mandarine Drake, r. Mandarin Dr.
 57. Genus Aptenodytes, r. G. Aptenodyta
 58. Gen. Diomedea, r. Diomedea
 D. Chiororynchos, r. Chlororhynchos

NATURAL HISTORY.

PLATE

61. For Gen. Laurus, read Gen. Larus
 62. G. Phœnicopterus, r. Phœnicopterus
 67. Charad. africanus, r. C. apicarius
 68. Fulica porphyris, r. F. porphyrio
 71. Genus Dodo (*Latin name*), r. G. Didus
 73. Meleagris gallipavo, r. M. Gallopavo
 78. Tetrao ferruginus, r. T. ferrugineus
 79. Columba Crythroptera, r. C. erythroptera
 81. Turdus peripicalatus, r. T. peripicillatus
 82. Ampelis Pompodora, r. A. Pompodora
 88. R. headed Swallow, r. Rufous-headed Swallow
 Acculeated Swallow, r. Aculeated Swallow

REPTILES.

101. For Anguis Coraline, read A. Corallinus
 A. Jamaicensis, r. A. Jamaicensis
 102. Amphibæna fuliginosa, r. A. fuliginosa
 103. Snowted Langaya, r. Snouted L.

FISHES.

105. For Genus Stromateus, read Gén. Stomateus
 Sternoptyx diaphæna, r. Sternoptyx diaphana
 Genus Anarhicas, r. Gen. Anarhichas
 112. Sparus Surinamensis, r. Sparus Surinamensis
 Sparus fasciatus, r. Sparus fasciatus
 116. G. Scomber Mackerel, r. G. S. Mackerel
 117. Ditto r. Ditto
 119. Platyftachus anguilaris, r. Platyftachus an-
 guillaris
 120. Salmo bimaculatus, r. S. bimaculatus
 S. Gasteropelecus, r. S. Gasteropelecus
 121. Fiftularia tobaccaria, r. F. tabacaria
 122. Genus Atherine (*Latin name*), r. G. Atherina
 123. Clupea Triffa, r. C. Thriffa
 C. Phoxinus Minnew, r. C. P. Minnow

PLATE

124. For Headlines for Order Branchioptegi, read Order
 Branchioptegi
 126. Pegafus draco, r. P. draconis
 129. Headlines for Order Chondrophrygii, r. O.
 Chondropterygii

INSECTS.

136. For Bostrichus pubescens, read B. pubescens
 Ptinus scotias, r. Ptinus scotius
 P. affelatus, r. P. tefellatus
 P. faccinicornis, r. P. pectinicornis
 137. Anthrenus fchrophulariæ, r. A. fchrophulariæ
 138. Caffida graffa, r. C. groffa
 141. Pausus fichteli, r. P. Fichtelii
 160. S. gigas, r. Sirex gigas
 S. juveneus, r. Sirex juvenicus
 S. lobata, r. Spheg lobata
 163. No. 13. Tipula ichneumonea, r. Diopfis ich-
 neumonea
 164. Rhagis fecolopacea, r. Rhagio fecolopacea
 168. Headlines G. Trombidium, r. G. Trombidium
 12 F. aquaticum, r. 12 Trombidium aquaticum
 13 F. abitargens, r. 13 Trombidium abitargens

WORMS.

178. For Headlines for Vermes, Order Intefata, read
 Order Intefina

SHELLS.

192. For Tellina fabulata, read Tellina fabula
 Tellina bimaculatu, r. Tellina bimaculata
 202. Headlines for Conchology, Order Volutæ, r.
 Conchology, Genus Buccinum — Genus
 Strombus
 226. Paramœcium, r. Paramecium
 Rolipoda pyrum, r. Kolpoda pyrum

ANCIENT AND MODERN ATLAS.

PLATE

I. Ancient Geography—Imperium Car. Mag. ad finem sæculi post Christ. VIII.

A few copies, only, of this Map were published with the parts of the Cyclopædia. The proprietors having afterwards determined to engrave the maps on a larger scale, it was cancelled, and a Map of the World, as known to the ancients, substituted in its stead as the first of the Ancient Atlas.

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- III. Britannia Romana, cum Hibernia et insulis adjacentibus
- IV. Peloponnesus, quæ antea Apia, Pelasgia, et Argos, antequam Romanæ ditionis fuit, &c.
- V. Hellas, five Græcia Propria, Thessalia et Epirus, antequam Romanæ ditionis fuerunt
- VI. Macedonia et Thracia, antequam Romanæ ditionis fuerunt
- VII. Asia Peninsularis, cum Insulis adjacentibus
- VIII. Ægyptus, provincia Romana Imperialis
- IX. Lybia, vel Africa, ora borealis
- X. Italiæ Regio Alpina, quæ vulgo dicitur Gallia Cisalpina
- XI. Italia Media, vel Italiæ propriæ pars borealis, ante divisionem ab Augusto factam
- XII. Italia Ulterior, cujus pars Australis Magna Græcia, ob Græcorum colonias, dicta, ante divisionem ab Augusto factam
- XIII. Sicilia, provincia Romanorum, cum Insulis adjacentibus
- XIV. Italia in regiones undecim ab Augusto descripta, cum Insulis Corsica et Sardinia
- XV. } Imperium Romanum
- XVI. }
- XVII. Hispania Romana
- XVIII. Gallia, sicut ab Augusto divisæ, pars meridionalis
- XIX. Gallia, sicut ab Augusto divisæ, pars septentrionalis. Additur, Gallia qualis fuit in eunte sæculo quinto Æræ Christianæ in 17 provinciis dispersita
- XX. Rhætia et Noricum, provinciæ Romanorum

TABULA

- XXI. Germania Magna, quæ nunquam Romanis paruit
- XXII. Terra Filiorum Israelis, antequam in duo Regna dispersita fuit, cum Terra Philistæorum, parte Phœnicæ, &c. Etiam, Judæa et Regiones finitimæ circiter initium Æræ Christianæ.

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INDEX OF THE PLATES.

Containing a List of all the Subjects represented on the Plates, arranged in alphabetical order, and classed under the several Sciences or Departments to which they pertain; together with References to the particular Plate and Figure where each Subject is delineated.

The Roman Numerals denote the *Plate*; the Arabic Numerals, the *Figure*.

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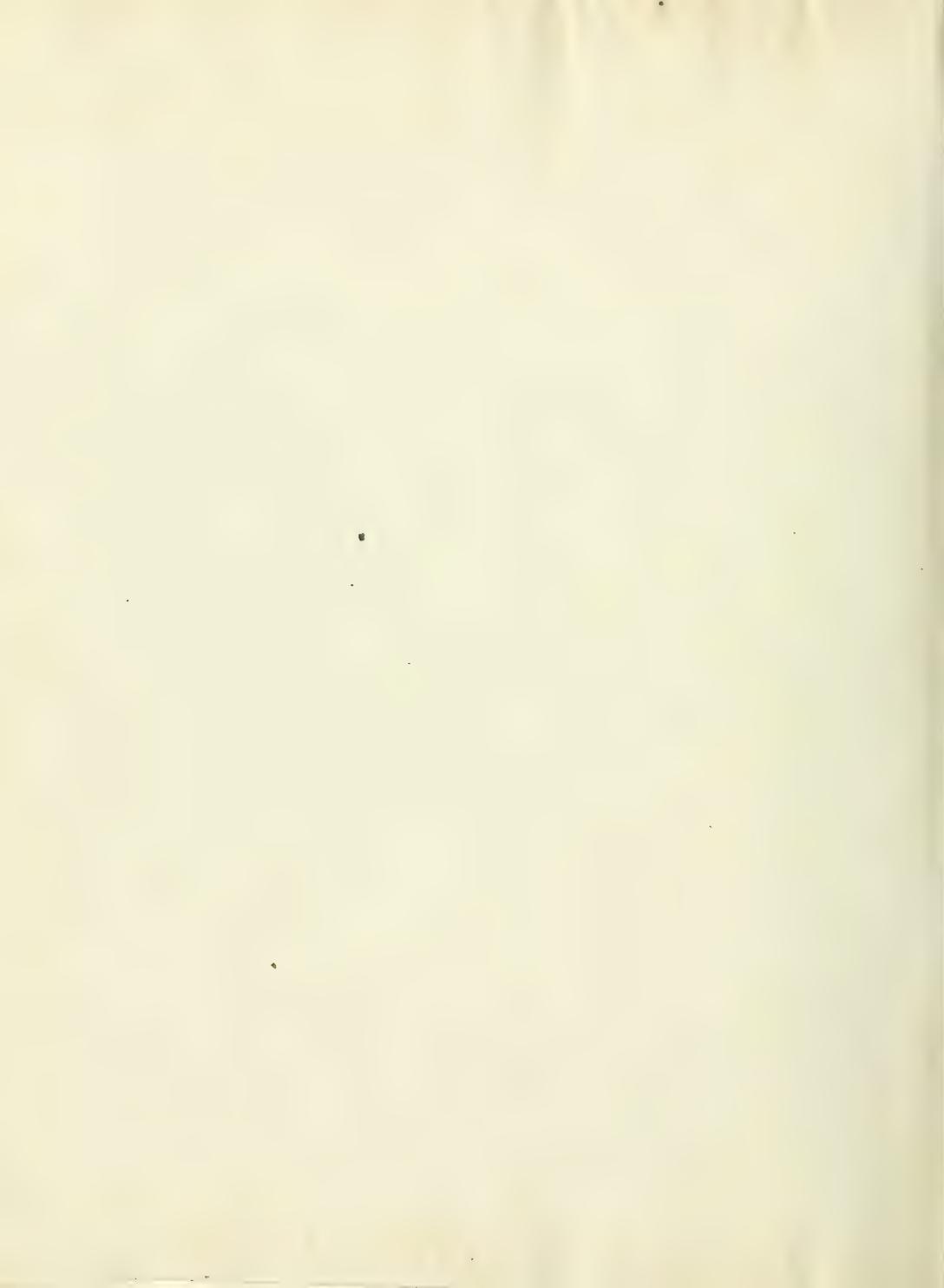
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