The Bengal dispensatory and pharmacopoeia. Chiefly compiled from the works of Roxburgh, Wallich, Ainslie, Wight and Arnot, Royle, Pereira, Lindley, Richard, and Fee, and including the results of numerous special experiments / by W.B. O'Shaughnessy.

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PUBLISHED BY ORDER OF GOVERNMENT.

Valerianeæ TO **Convolvulaceæ,** INCLUSIVE.

CALCUTTA:

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MDCCCXLI.

This Book may be kept for one Month by a Professor, and 14 days by a Student.—

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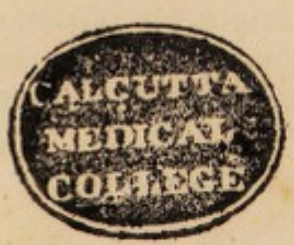

Stem woody, twining when young, round and smooth, leaves opposite, long stalked, oblong cordate, pretty smooth, entire, stipules broad, cordate. Panicles axillary and terminal, brachiate ; flowers numerous, deep pink, bracts ovate, calyx five-toothed, corolla with the tube long, somewhat gibbous and woolly inside, the limb narrow, divided into five cordate crenulate segments. Filaments short, inserted irregularly about the middle of the tube, anthers erect within the tube, ovary turbinate, two-celled, cells containing one ovule, each attached to the bottom of the cell, style single, stigma two-cleft, with the lobes bent amongst the anthers, berry dry, compressed, smooth, with five lines on each side, one-celled, two-seeded, seeds compressed, smooth, enlarged with a somewhat membranous ring all round. *Roxb. Fl. Ind.* i. p. 683.

The leaves are very fœtid and alliaceous, are used in baths, and given internally in retention of urine and in some fevers. The root Roxburgh states is used as an emetic by the Hindoos.

Two other species are described by Roxburgh.

Gen.—Canthium.

Sp. Canthium parviflorum.

Vern. Balusoo-kura, *Tamul.* Naga valli, *Sans.*

A common thorny bush through India, especially on the Coromandel coast.

A decoction of the leaves or root is prescribed in India in dysentery, and is also given in worm cases. About three ounces are given daily. The fruit and leaves are eaten.

Gen.—Chiococca.

Sp. 1. *C. anguifuga.*

A native of Cayenne, Brazil, Peru, and some of the West Indian islands.

Sp. 2. C. densifolia. Native of Brazil.

The roots of these two species are deemed in Brazil certain remedies in snake bites. The infusion of the bark of the root is a powerful emetic and cathartic, and these effects are followed by perspiration and sleep. This remedy has been used in dropsy by several regular and highly informed practitioners, and with excellent results.

Gen.—Coffea.

Sp. Coffea arabica.

This celebrated plant is inserted here only to shew its place in classification.

Gen.—Palicourea.

Sp. Palicourea Marcgraavii.

A poisonous plant of Brazil, the properties of which are but little known.

Several other species are mentioned by Lindley, some of which are diuretic.

NAT. ORDER LXXVII.—VALERIANEÆ.

The valerians are herbaceous, with leaves opposite, entire, or divided; flowers in terminal bouquets. The order is found only in temperate climates, being absent from the plains of India, and one species only being found in Deyra-Doon.

Dr. Royle informs us that the valerians extend from Sylhet to Sirmore and Cashmere, the V. Hardwickii, villosa, and alata, being the prevailing species.

The annual valerians are devoid of smell in all their parts, while the perennial species have perfumed flowers and roots, which contain a very strongly scented volatile oil.

Gen. 1.—Valeriana.

Sp. 1. *V. officinalis.* Valerian.

Off. The roots.

Found in wet places all over Europe. The roots are white, small, with a short truncated neck with long thick cylindrical filaments, covered with short hairs of brownish or olive colour; substance white. The odour is very strong and penetrating, and increased by drying the roots. The taste sweetish and bitter. Roots of various other species and of some poisonous Ranunculaceæ have been fraudulently mixed with this article.

According to Tromsdorff's experiments, 381 parts of valerian root contain 48 peculiar matter soluble in water, 24

black resin, 1 volatile oil, 36 gum, 6 fecula, and 266 woody fibre.

The volatile oil is pale yellow tinged slightly green, lighter than water, thickens considerably by the action of the air; its odour is camphor-like, and very penetrating; its taste acrid, and bitter. Cats are remarkably affected by, and attached to, the odour of this oil. It seems to intoxicate them with pleasure. Feé considers the odour to resemble that of the urine of the animal, and thus attempts to explain the effect produced on their system.

Valerian given in infusion has long been deemed a very valuable remedy in the treatment of the atonic forms of hysteria, hypochondriasis, chlorosis, and amenhorrea; it has also been used in epilepsy, but with very doubtful advantage. For formulæ for the infusion and tincture, see the Pharmacopœia.

Sp. 2. V. celtica. Ναρδος χελτιχη, Celtic valerian.

A native of Piedmont and the Tyrol, found also in other mountainous countries. The roots are cylindrical, the thickness of a goose quill, fibrous, surrounded with membranous, linear, oblong, smooth, and loosely imbricated scales. In odour and taste this root resembles, but is weaker than the first species. The aqueous infusion smells of saffron, and is rendered brown by the addition of salts of iron.

These roots are annually exported from the Austrian states to Egypt, to the amount of about 60 tons weight. They are much esteemed in the Levant as a perfume and cosmetic; in Europe they are no longer employed.

Gen. 2.—Nardostachys.

Sp. Nardostachys Jatamansi, (see Royle's Illust. p. 243. t. 54.)

Syn. Valeriana Jatamansi, (Jones As. Rs. ii. p. 405. iv. p. 109.) Patrinia Jatamansi, *Don.*

Ναρδος ινδικη. Dioscorides—*Indian spikenard.*

Vern. Sumbul Hindee. Sumbool-ul-teb, *Arab.* Balchur, *Hind.*

A native of the mountains of the north of India, at very great elevations.

A dwarf herbaceous plant, with a long hairy tap root, stems perennial, very short, simply divided into a number of shaggy scaly crowns from which the leaves proceed; branches erect, a few inches high, downy, leaves obovate, lanceolate, three ribbed, downy, those next the root acute, the upper ob-

tuse. Flowers pale pink, clustered in the axils of the upper leaves, which serve as a kind of involucre. Limb of the calyx five-parted, lobes ovate oblong, acute, leafy, somewhat toothed, permanent, corolla regular, ecalcarate, obtusely five-lobed, bearded in the throat. Stamens four, attached to the bottom of the corolla, stigma capitate, capsule three-celled, crowned by the lobes of the calyx, and almost shorter than they are; not adnate to a bract. D. C.

The roots of the Jatamansi are brought down from the mountains in large quantities. Considerable discussion has arisen as to the true origin of the celebrated spikenard of the ancients, but the labours of Sir William Jones and Professor Royle leave no longer any reasonable doubt as to its being truly referrible to this article. The root is of blackish colour, and resembles the bushy tail of the ermine. Its odour is strong and fragrant, and is much esteemed by all Eastern nations.

For medicinal purposes our experience leads us to believe that this species is a perfect representative of the valerian of the English Pharmacopœia.

NAT. ORDER LXXVIII.—DIPSACEÆ.

The Dipsaceæ are generally herbaceous, with opposite and rarely verticillated leaves; the flowers are seldom distinct, but usually combined on a common receptacle. Their interest to the medical practitioner is but trifling; some are slightly bitter, and have been deemed antiherpetic, but apparently on inadequate grounds.

The *Dipsacus fullonum*, teasle, or fuller's thistle, is, according to Royle, the *Dunsakoos* of the Indian Materia Medica.

NAT. ORDER LXXIX.—SYNANTHEREÆ.

A great and very natural order, usually termed *Compositæ*, and named as above from their anthers being collected into one adherent mass. They have been also named *Syngeneseæ* from the same cause.

It is composed of herbaceous, rarely woody plants, with compound flowers, that is, bearing a variable number of flowers, sometimes unisexual, and sometimes hermaphrodite, united together on a common receptacle. They occur in all parts of the globe; in France they constitute as much as

one-seventh of all the phanerogamic division; at the Cape one-sixth; in Germany one-eighth; in America one-sixth.

Dr. Wallich enumerates 426 Indian species from the plains and mountains.

The prevailing colour of the flowers is yellow, those which blossom in the spring are usually blue, white, or rose-coloured.

The order has been divided into 19 tribes by Cassini, and these have been adopted by Feé. Lindley has made three separate orders of it, namely, *Asteraceæ*, *Cynaraceæ*, and *Cichoraceæ*. We shall adopt Feé's arrangement of genera as most convenient for the purposes of this volume.

A bitter principle abounds in several of this order, for example in the Absinthiums, or wormwoods; essential oil exists plentifully in the camomiles and pellitory, and these species are at the same time exceedingly bitter; the seeds of many possess a fixed oil in such quantities as to render its manufacture economical; for example, the seeds of the sunflower, and ramtilla. The essential oil resides in the perisperm, the fixed oil in the almond.

The proper juice of some Synanthereæ is milky and rather narcotic, still but few are justly suspected of dangerous properties. Starch is but in very small proportion in any of the species, hence few can be deemed alimentary, though from the presence of mucilage, saccharine matters, and extractive or modified bitter principles, some are used as table vegetables, such as the artichoke, lettuce, and endive; no peculiar principle of much importance has been detected in the plants of this order.

In their medical uses these plants are tonic, febrifuge, vermifuge, or emollient. The properties of one species generally co-exist in all the congenerous individuals, and thus the research for substitutes is much facilitated.

Gen. 1.—Lactuca.

Europe produces a great number of lettuces, and a few occur in Asia. They are generally herbaceous plants containing a very abundant watery juice; they grow rapidly; the roots are fibrous. The roots and stalks often abound in a milky juice, which is rather astringent and sometimes slightly narcotic. The seeds contain fixed oil easily obtained by expression; no essential oil occurs in any of these plants hitherto examined. The Lactuceæ are generally innocent, by cultivation their tenderness is increased, and their bitterness diminished.

Sp. 1. *Lactuca virosa,* Strong scented lettuce.
θριδαξ αγρια, *Diosc.*

A native of Europe, of disagreeable and virose smell, acrid and bitter taste; on analysis yields a bitter principle and a peculiar acid, resin, caoutchouc, wax, gum, albumen, and salts.

The inspissated juice of this lettuce produces symptoms like those caused by opium, but it requires to be administered in at least a sixfold dose; neither morphia nor anarcotine have been detected in this substance.

Sp. 2. *Lactuca sativa.* Garden or Roman lettuce.
Vern. Kahoo, *Hind.*

A well known garden vegetable, inodorous, of scarcely sensible taste, or slightly bitter; at the flowering time it contains a milky juice, which has acquired some celebrity under the name of—

Lactucarium, or Thridace.

A resinous looking substance in irregular masses, colour brown, imperfectly soluble in water, destitute of morphine or anarcotine, containing resin, malate of lime, and an azotized extractive substance; odour strong and virose, taste bitter, analogous to the smell.

Lactucarium is obtained by cutting off the tops of the full grown lettuce, collecting the milky juice which exudes, and inspissating it by a moderate heat.

We are indebted to Dr. Cox of Philadelphia, Dr. Duncan of Edinburgh, and M. Francois for the first experiments on the sedative and anodyne influence of this preparation. It is stated to produce sleep without determining narcotism; to prove sedative without any previous stimulation, and thus to afford an excellent substitute for opium in many cases in which the latter drug is inadmissible.

In the Transactions of the Medical and Physical Society of Calcutta, Dr. Graham has published a valuable paper on this subject.

Dr. Graham's lactucarium was prepared under his own care. He describes the cultivation of the plant as being attended with no difficulty, and resembling that of the poppy. Eight or ten inches radius is given in all directions to the growing plants to permit them to grow large. When about to flower the juice is most abundant, and is to be collected by making a clean oblique division of the stem about an inch and a half from the top, when the milky secretion

instantly exudes from both extremities, and is removed with a knife about two inches long and ¾ broad, with a blunt edge. The collected juice rapidly turns brown and granular, like opium. From four to twelve grains are recommended as a dose. Dr. Graham cites some interesting cases in proof of its valuable sedative action.

We are indebted to Mr. Porteous, of Calcutta, for a very fine specimen prepared in his own garden at Howrah. We could not detect in it the least vestige of morphia, anarcotine, or meconic acid, but found it distinctly sedative in six grain doses. It did not seem to affect the bowels in any degree either as an astringent or aperient.

In the Appendix to the Vol. of the Calcutta Transactions above quoted, the late Mr. Twining details the particulars of six cases in which lactucarium prepared by Dr. Graham was given to the extent of 12 grain doses. The remedy appeared to produce very little effect, except under circumstances rendering the results but doubtful. In a note it is added however that it was given in several cases in the European Insane Asylum with decided advantage; the dose was 12 grains at bed time, repeated daily till amendment was produced.

Gen. 2.—Taraxacum.

Sp. T. officinale, Dandelion.

Syn. Leontodon Taraxacum.

A native of Europe and the Himalayas; root tap-shaped, very milky, externally black, difficult of extirpation, leaves numerous, spreading, of a bright shining green, quite smooth, tapering downwards, sessile, pinatifid with sharp unequally toothed lobes pointing downwards, or *runcinate* as it is termed by botanists. Scapes one or more, longer than the leaves, erect, smooth, brittle, naked. Flower heads 1½ inch wide, of a uniform golden yellow colour, expanded only in the morning and in fine weather; outer scales of the involucre several, linear, oblong, loosely recurved and wavy. As the fruit ripens the involucre becomes reflexed close to the stalk, leaving the light globe two inches in diameter formed by the radiating pappi, quite exposed till dispersed by the winds.

The inspissated juice of the plant, the infusion, decoction, and extract of the root, are strongly bitter, and prove tonic and diuretic, in large doses aperient. It is a favourite, and we believe useful remedy in the old hepatic diseases of per-

sons who have long resided in India, and returned to a cold climate. The dose of the extract is 3 to 10 grains, thrice daily. For formulæ for infusion and decoction, *see Pharmacopœia.*

Gen. 3.—Cichorium.

Sp. C. Intybus. Wild succory, Κιχωριον, Diosc. Europe. Leaves radical, oblong, deep green, deeply lobed, lobes toothed, cauline leaves small, sessile, and very entire; inodorous, taste very bitter. Roots fusiform, cylindrical, the thickness of the finger, 8 to 10 inches long, descending, fibrous, whitish or yellowish externally, very white within. Bark of root fleshy and lactescent, root inodorous, taste at first sweetish and mucilaginous, then very bitter, the bitterness greater in summer than in spring.

An Indian species called *Kasni*, scarcely differs from this article.

The roots contain nitrate and sulphate of potash, mucilage, and some bitter extractive principle. An infusion of succory mixed with syrup causes a thickening of the liquid, and a substance is formed termed by the discoverer, M. Lacarteria—

Saccho-Cichorine Gum.

This substance is solid and elastic, grey, heavier than water, in which it is imperfectly soluble at common temperatures, but is dissolved at 212; it is destitute of smell, is of somewhat bitter taste, and is not applied to any useful purposes.

When succory is cultivated in a dark place it remains colourless, the root lengthens remarkably, loses its bitterness, and becomes very tender.

The roots roasted and ground have been proposed as a substitute for coffee, and were much employed in France during the suspension of the foreign trade of that country.

Under this group we find several plants noticed by Feé possessed of great bitterness, and probably deserving of further examination. The chief are the following genera:—

Hieracium, ...	Bitter and milky.
Sonchus, ...	Very bitter.
Lapsana, ...	Bitter and milky.
Picris, Picridium, Crepis, Barkhausia, ...	Bitter and milky.

The Picris repens is used in Cochin China as a bitter tonic.

Gen. 4.—Centaurea.

Bitter, not lactescent plants, the majority of which are European; they are distinguished by a peculiar, somewhat musky odour.

Sp. 1. *Centaurea benedicta.* Blessed thistle, south of Europe. Ακορνα, Theoph.

Stalks reddish, woody, branched, 12 to 18 inches high, elongated, toothed, velvety, having one nerve; the inferior leaves deeply lobed, flowers yellow, with a double calyx, the external one armed with yellow branching prickles, inodorous, leaves intensely bitter; the seeds contain an oily kernel. The entire plant by incineration yields a large proportion of carbonate of potash.

Sp. 2. *C. Cyanus*, Μηκων Ηεραχλεια, *Theoph.* Casse lunette, *French.*

Flowers a lovely azure blue, taste slightly bitter. The distilled water was once so esteemed as an application to weak eyes, that the plant received the popular name of *casse lunette*, or "*break your spectacles.*" A fine azure colour is prepared from the petals, and is much used by miniature painters.

In the French Codex, with the preceding species we find, as enumerated by M. Feé,

Sp. 3. *C. Centaurium*, or great centaury, common in the Alps, three to five feet high, root very bitter, and rather aromatic.

Sp. 4. *C. Jacea*, Europe, bitter and astringent.

Sp. 5. *C. Calcitrapa*, Star thistle, caltrop—bitter, and asserted to be febrifuge.

Sp. 6. *C. lanata*, (Carthamus lanatus, Lin.) bitter.

Sp. 7. *C. Behen*, white Behen, white Rhapontic, *Behmen Abiad* of the Arabs.

An annual plant which abounds on Mount Lebanon, with lyre-shaped radical leaves, and opposite lobes, the stem leaves amplexicaul, roots the thickness of the finger, rugose,

grey externally, whitish within, with an agreeable aromatic odour, and glutinous, slightly styptic taste. It is a bitter tonic, and used for seasoning among the Persians.

Gen. 5.—Arctium.

Sp. A. Lappa, Burdock or Clit-bur. Απαρινα, *Theoph.* Αρκτειον, *Diosc.*

Syn. Lappa minor, D.C.

Common everywhere in Europe.

Root cylindrical and spindle-shaped, large, a foot and a half long, descending, with thready fibres, ash-brown externally, white and spongy within; near the neck there are traces of withered scales; odour weak and unpleasant, taste mucilaginous and bitter. The seeds are exceedingly bitter when fully ripe.

The leaves have been used as a local application in medicine, the seeds are deemed diuretic. The roots are given in decoction as a tonic and alterative in Ireland, where we have witnessed effects from the remedy quite equal to those of sarsaparilla.

The root deserves extensive trial; the seeds also are very likely to prove of value on further examination of their properties; in Ireland they are used as a popular remedy in ague.

Feé alludes to three varieties of this plant—the downy, great, and dwarf burdock. The generic name is derived from αρκτος, "a bear," on account of the thorny nature of the fruit.

A closely allied species is found in the Himalayas.

Gen. 6.—Carthamus.

Sp. C. tinctorius, Safflower, or Bastard saffron.

Κνηκος, Hippocr.

Vern. Koosumbha, *Sans.* Koosum, *Beng.*

A native of the south of Europe, of Egypt, and of India, cultivated especially in Behar and Dacca.

The Carthamus is an annual plant, with an upright, firm, smooth stem, of a colour approaching to white, and about 3 feet in height. Leaves oval, and edged with small spines; each branch bears a flower-head composed of several florets, all of which are furnished with stamens and pistils. The flowers are of a deep red colour.

The plant is propagated by seeds sown in drills at 1½ feet distance from each other. The young plants appear in about a month, and after the second month are hoed and thinned, each plant being left a foot from the other. The richer the land, the larger the proportion of colouring matter afforded by the flower.

On the opening of the flowerets they are rapidly gathered without being allowed to expand fully. They are then dried in the shade with great care.

The flowerets are red, funnel-shaped, with elongated filiform tube, and 5-parted limb; they are nearly tasteless, but have a strong saffron-like odour. The fruits are white, brilliant, conical, slightly incurved, sub-quadrangular with enlarged base, obtuse towards the summit, nucleus oily, covered with a cartilaginous episperm, taste sweetish and somewhat acrid.

According to the experiments of Dufour, Marchaco, and Dobereiner, the petals of the safflower contain in 100 parts moisture 6, dust 3, vegetable albumen 5, yellow colouring matter 24, extract and saline matter 5, resin 0.3, red colouring matter 5 (per 1000) with wax, fibre, oxide of iron, &c.

The yellow principle is worthless as a dye. It is soluble in water, is removed by washing, and thrown away as the first step, in the preparation of the valuable red product.

The red dye is an acid resinous substance of superb colour, insoluble in water and in acid solutions, little soluble in alcohol, and not at all in ether. It is dissolved freely by aqueous alkaline solutions, which it neutralizes. Its salts (carthamates) are crystallizable, and quite colourless; acids precipitate the carthamic acid from solutions of these salts. To obtain it on the large scale after the separation of the yellow matter, the dried flowers are treated by a solution of carbonate of soda, and lemon juice added; the carthamic acid precipitates, is collected by subsidence, washed, and carefully dried at a gentle heat.

The most lovely tints are imparted by this dye to silk and cotton; *rouge* is a mixture of the dry carthamic acid, and finely powdered talc. The *pink saucers* used for giving a flesh tint to silk are prepared from this dye with a small portion of soda. 8 oz. of the prepared petals, and 2 oz. carbonate of soda are acted on by 2 gallons of water, 4 lbs. of prepared chalk are added, and the colour precipitated upon this by citric or tartaric acid.

The Chinese card-rouge is a carthamate of soda, colourless when rubbed on, but the salt being decomposed by the acetic acid secreted by the skin itself, the carthamic acid

separates in the most perfect rosy tint, which can be imagined.

The seeds are said to be purgative and emetic in moderate doses.

It is certain, however, that paroquets feed on them with great avidity, and without experiencing any ill effect. They yield abundance of fixed oil.

In 1837—38, the trade in safflower from Calcutta stood as follows :—

Exported to		Bazar Maunds.	Value.
			Rupees.
Safflower,	Great Britain,.....	10,052½	2,01,349
	N. America,.....	288	5,760
	France,.....	456	8,750
	Pegu,...	6¼	120
	Singapore, ...	140¾	2,185
	Gulphs,...	12¼	248
	Total,.....	10,956	2,18,412

Or 18 rs. 7 as. per Bazar Maund.

Gen. 7.—Anthemis.

This remarkable genus exists chiefly in the ancient continent. All its species are bitter and aromatic ; they abound in essential oil, and the bitterness is accompanied by a nauseating principle which has not as yet been separated. From the essential oil crystals of camphor are deposited by long keeping. The taste of the roots is sometimes very pungent, and determines copious salivation.

Sp. 1. *Anthemis nobilis.* Camomile.
Vern. Baboone phool, *Pers.* and *Hind.*
Off. The flowers.
A native of Europe and Persia.

The flowers are radiated, receptacle nearly flat, paliaceous, florets tubular, yellow; demiflorets numerous, short, white, three-toothed, calyx composed of whitish sepals.

Odour strong, balsamic, agreeable, taste analogous to the smell, bitter and rather hot, both dissipated by time ; cultivation causes the demiflorets to disappear, when the flower becomes globular and large, but its aroma and bitterness diminish.

Besides essential oil and bitter matter, camomile flowers contain gum, resin, and traces of tannic acid.

The essential oil is azure blue, passing to yellow by contact with the air, consistence rather thick, lighter than water, odour and taste like those of the flowers. By keeping it deposits camphor in crystals; 82 lbs. of the flowers afford only 13 drachms of the oil.

An extract and tincture of these flowers occur in most Pharmacopœiæ.

Medical uses. Camomile flowers afford in Europe a cheap and efficient antispasmodic and bitter tonic. They are much used in infusion as the vehicle for other medicines employed in the treatment of hysteria, colic, suppressed menstruation, &c. The warm infusion taken freely after tartrate of antimony and ipecachuana much facilitates the action of these emetics. The powder has been employed to the extent of two drachm doses as a preventative of ague, and it is stated, on good authority, with much success.

The essential oil is in proportion more powerful as an antispasmodic than the other preparations, but is destitute of tonic or emetic properties.

Sp. 2. *Anthemis Pyrethrum*, Pellitory.

Syn. Anacyclus Pyrethrum, D. C. Πυρεθρον, Diosc. iii. p. 86.

Vern. *Akurkura.*

A native of the south of France, Barbary, &c.

Off. The roots.

The roots are descending, the length of the finger, and the thickness of a swan quill, of ash-brown colour, with capillary scattered fibres; they terminate superiorly in silky filaments, or remains of leaf stalks. Internally the roots are white, a little fleshy while fresh, the medullary centre orbicular and starred. When dry they are hard and brittle, when recently collected the smell is heavy and disagreeable, but this ceases on perfect drying. The taste is peculiar and saline, tenacious, acrid, determining profuse and immediate salivation. It is worthy of remark, that like the blistering fly, notwithstanding its acridity this root is rapidly devoured by worms.

100 parts of the Pyrethrum root give traces of volatile oil, 5 of fixed oil, 14 yellow colouring matter, 11 gum, 33 inuline, 35 lignine, muriate of lime and loss 2. The stimulant principle appears to be a compound of the oil and resin.

Pyrethrum root is used as a masticatory to relieve toothache, enters into the composition of certain snuffs, and the

powder is used in large quantities by the Mahommedans to excite transpiration, being rubbed upon the skin; it is used internally also as a cordial and stimulant in lethargy and palsy, and in certain stages of typhus fever. *Ainslie*, vol. i. p. 301.

We are acquainted with two remarkable cases of spontaneous salivation of the most obstinate form, which after resisting every other treatment for more than three months were effectually cured by this root.

Gen. 8.—Artemisia.

Sp. 1. *Artemisia Absinthium*, Wormwood, Αψινθιον, Hippocr. and Diosc.

A native of hilly and uncultivated situations in Europe. The stalk is erect, about 2 feet high, rather pubescent, the leaves inferior, tripinnate, with oval segments, lanceolate, silky, and sometimes confluent; the cauline leaves are twice pinnatifid, the floret ones simple. Flowers yellow, small, pedunculate, drooping, disposed in axillary clusters. The odour strong and disagreeable, taste so intensely bitter, that it has become proverbial.

According to Braconnot's analysis in the 5th vol. *Bul. de Pharmacie*, p. 549, the Absinthium contains a very bitter and azotized matter 18, insipid substance 8, resinous bitter 1.4, green volatile oil 0.09, chlorophyle a trace, albumen 7.5, fecula 1, salts of potash 7.5, ligneous fibre and water 55, in 599.3 parts.

The Absinthium is still much used in medicine, and affords an extract, a tincture, tonic syrup, &c. The volatile oil is green, camphoraceous, lighter than water, of repulsive bitterness; it has been used as a vermifuge, but requires to be employed with caution.

The flower is sometimes substituted for the hop in beer. A liqueur is prepared from it in Switzerland, which is a general favourite, despite of its bitter flavour. It has been remarked that the milk of animals under the influence of absinthium is nearly as bitter as the plant itself.

Sp. 2. *Artemisia indica.* Indian Absinth. Native of Nipal. *Vern.* Afsunteen, *Arab.* Mustaroo, *Duk.* Duna, and Murwa, *Hind.* Dana, *Sans.*

Substituted for the former, but weaker.

Sp. 3. *Artemisia Abrotanun*, Αβροτανον, Diosc. iii. p. 29. Abrotanum, *Pliny.*

A native of the south of France. Stalk woody, two to three feet high, the thickness of the finger, brittle, brown,

branching, and resembling a little tree; leaves petioled, greenish, divided into linear leaflets. Flowers yellow, sessile, racemiform, thin and terminal, odour strongly that of the lemon, taste bitter, and very acrid.

Extravagant notions were once entertained of its virtues, which however do not surpass those of the other congenerous species.

Sp. 4. *Artemisia vulgaris.*
Vern. Nagdowna, *Hind.*
A native of Europe.

Stalks woody at their bases, channelled, vertical, 3 to 6 feet long, leaves whitish below, and green above, pinnatifid with linear incisions towards the summit of the stalk. Flowers in loose sheaths, lateral, small, and whitish. Inodorous, slightly bitter. Inferior in power, but of similar properties to the preceding species.

The Moxa of Japan is prepared with the leaves and stalks of a neighbouring species.

Sp. 5. *Artemisia Dracunculus.* Ταρχον. Diosc.
A native of Siberia, cultivated in gardens in Europe.

Stalks thin, branching, several feet in height, leaves simple, very entire, linear, lanceolate, the surface scattered over with an infinity of minute glandular pores containing essential oil. Flowers small, yellowish, and terminal.

Odour of the leaves smart, pungent, and agreeable; taste pungent, a little acrid and aromatic. The inspissated juice of the leaves is by many practitioners considered a powerful sudorific. It owes its name Dracunculus, or dragon, to the numerous snake-like twistings of its root.

Sp. 6. *Artemisia rupestris.*
A native of the rocks and ravines of Auvergne, Switzerland, Siberia, &c.

Stalk not higher than 4 or 5 inches, covered in common with the rest of the plant with a silky down. The flowers form terminal spikes, the leaves are divided and petioled. The whole plant evolves a sweet aroma; its taste is bitter and camphor-like. It is much esteemed as an application to injured parts, and also taken internally, and supposed to be tonic and diaphoretic.

Sp. 7. *Artemisia Contra.* Semen-contra of the Levant, Aleppo, and Alexandria. A native of Persia.

The unopened flowers and calices (worm-powder, semen-contra, semen-sanctum, &c.) are small, globular, turbinate, subaggregate, obtuse, greenish, very slightly pubescent, or smooth and scaly. The scales oval, obtuse, concave, very slightly ciliate, the lower smaller than the superior.

Floral peduncles short, stiff, and cylindrical. Leaves green, small, subulate, obtuse, compressed at both extremities, keeled, smooth.

Odour strong, nauseous, and balsamic, taste analogous, rather bitter, hot, durable, and very disagreeable; on chewing this substance a most distinct sensation of coolness is experienced.

The vermifuge properties of this celebrated medicine reside in a volatile oil, and resinous extract; 500 parts of *semen-contra* furnish two of essential oil, of light lemon-colour, of bitter and burning taste, of smell resembling that of peppermint.

Sp. 8. *Artemisia judaica*, worm seed. Saheba, *Avicenna.* Indian Semen-contra. A native of Judea, Arabia, Cochin-China. Undeveloped calices affecting two forms—linear, striated, obtuse at both extremities, or at one only, of yellowish white colour, and downy. Odour and taste as in preceding species.

The semen-contra of Barbary is more coloured than that of the East; it is cheaper, and of more certain origin. Both varieties resemble each other in quality; one only being smooth and green, the other downy and grey. Semen-contra was long attributed to the Zedoary plant.

M. Merat in his *Dictionnaire des Sciences Med.* p. 50, recognised three varieties of this drug. M. Feé believes that two of the sorts alluded to proceed from the same source. The *Artemisia palmata* has a similar taste and smell. According to Batké the *A. glomerulata* has equal virtues.

Sp. 9. *Artemisia moxa*, a native of China and Siberia.

Stalks herbaceous, simple, about two feet high, straight, branching, covered with very thick leaves, the inferior obtuse, 3 lobed, superior, leaves lanceolate, linear, very entire, all are sessile and downy, flowers small, pale, terminal, and turned upwards; all parts of the plant are alike nearly inodorous and tasteless.

The moxa, a slow caustic, is prepared from the down of this plant. It is made into conical masses, and burns like tinder, when touched by a spark or any red hot body.

Besides the preceding species, Feé enumerates and gives very brief notices of the following :—

A. maritima, Bitter.

A. procera, like the last.

A. campestris, do. do.

A. zeylandica, or *biennis*, used in beer by the celebrated Captain Cook for his crew when labouring under scurvy.

A. annua, esteemed a febrifuge in Cochin China.

A. arborescens common in Italy and all the East; employed for the same purposes as the "greater absinth" of our article.

[*Medicinal uses of the Artemisiæ.*]

The *Semen-contra* is a well known, and much esteemed anthelmintic, especially in the round and long worm of children, *(lumbricus teres.)* The action is heating and stimulant, dose 10 grs. to ½ a drachm finely powdered, in electuary with honey, or diffused through milk, and taken when the stomach is empty. In infusion or decoction the bitterness is quite disgusting; cathartics should either follow or accompany its use.

The leaves and flowering heads of the common wormwood, or mugwort, are used chiefly as a stomachic tonic; a cold watery infusion is applied to bruises, but with very questionable benefit. The roots have been strongly recommended by Drs. Burdach, Hufeland, and Loewenhoeck in the treatment of epilepsy, the dose being from 50 to 70 grains given in warm beer half an hour before the expected paroxysm, and the patient put to bed, and warm diluents given so as to excite free perspiration. We are told that the remedy is to be persevered in as long as the disease remains.

The extract of wormwood is a mere bitter, and like many others used with great benefit in some forms of dyspepsia, intermittent fevers, dropsies proceeding from debility, scurvy, and similar diseased conditions. Hufeland prescribed it in ten cases of epilepsy, of which three were completely cured, three much relieved, and four received no benefit; the operation in these cases was tonic, diaphoretic, and diuretic; in plethoric cases its use should be preceded by cathartics and depletion of blood.

The use of moxa, or of actual fire, to the surface of the body is a favourite practice in all savage and even half civilized nations. In China the down of the Artemisia Chinensis is set on fire, and the burning end applied directly to the part. In India a red hot *gool*, or hookah pastille, is usually employed. In Italy a small flame of hydrogen has been lately tried, and in Germany it is a common practice to place a particle of phosphorus on the skin, and then ignite it. The object in all is to effect counter-irritation, and the usual cases in which it is applied are chronic rheu-

matism, sciatica, neuralgia, deep seated diseases of the bones, cartilages, or ligaments. In India *gools* are used by the native empirics for almost all diseases, especially for enlargements of the spleen and liver.

The most disastrous effects often succeed the application of the cautery in this or any other form to the tendinous parts, such as the wrist, back of the hand, temple, &c. We have witnessed three fatal cases of lockjaw induced by the cauterization of the wrist by an ignited gool.

To prepare an excellent substitute for Chinese moxa, take fine cotton, soak it in a solution of saltpetre in cold or tepid water, dry it before the sun, when dry press it into cones of various sizes from ½ an inch to 1½ inch in diameter at the base, and about two inches high. To apply these cones press one on the part by a wire ring or a pair of forceps, ignite the apex of the cone, and blow gently on it through a reed, to facilitate the combustion. The moxa should be removed before it has burned quite down to the skin; a blistered surface is thus at once formed which usually sloughs, leaving an open suppurating sore, rather difficult to heal.

Gen. 9.—Achillea.

Sp. A. Millefolium. Europe.

Contains a bitter principle and essential oil, is of very little value. The *A. herba-rota*, common in the Alps of Piedmont and Dauphiny is bitter, acrid, and aromatic, contains much essential oil, and deserves experimental trial.

Gen. 10.—Tanacetum.

Sp. T. vulgare. Tansy. Europe, everywhere.

An herb of very strong and fragrant odour, aromatic and bitterish taste, containing much essential oil with bitter extractive and resin. The leaves are generally employed for seasoning in Europe, and the whole plant enters into numerous popular receipts for producing sweating and curing colds.

Besides the preceding articles Feé quotes under the tribe of the Anthemideæ the *Santolina Chæmycyparissia* (*citronelle,*) as a powerful bitter and stimulant, and the *Diotis candidissima,* employed in the East as a diuretic; he also mentions others of no importance.

Gen. 11.—Inula.

Sp. Inula Helenium. Elecampane. Europe.
Off. The root.

Roots white, very large, branched superiorly, branches cylindrical, shortened, covered with filiform fibrils, parenchyma fleshy, a transverse section of which presents radiating streaks. Smell strong and camphor-like, taste bitter, disagreeable, and tenacious, not unlike the Acorus calamus, or *butch;* when chewed it excites copious salivation. Powder yellowish white. According to Finke's analysis these roots contain a white solid matter, apparently intermediate between essential oil and camphor, a bitter extractive, free acetic acid, crystallizable resin, albumen, fibrous matter, &c. also a variety of starch termed *inuline.*

Inuline is insoluble in cold water, or merely suspended and soon thrown down. Soluble in hot water, but deposited unaltered on cooling, insoluble in alcohol, decomposed by nitric acid, oxalic acid being formed. It is inodorous and insipid, and not rendered blue by iodine.

Although first detected in this root, inuline has subsequently been found in the pellitory, in gall nuts, and in many other vegetable substances.

A decoction of the root is much praised as an application in several cutaneous diseases, especially those in which itchiness is a troublesome symptom. In decoction, and applied externally, it is a gentle stimulant; the extract is merely a weak bitter.

I. dysenterica is astringent, and therefore used in some countries, as its name imports.

Gen. 12.—Conyza.

Sp. 1. *C. anthelmintica,* India.
Syn. Vernonia anthelmintica, D. C.
Vern. Bukchie, *Hind.*

All parts of this plant are bitter. The powdered seeds are used as a worm medicine.

Sp. 2. C. balsamifera, India. *Soomboong* of the Javanese.
Syn. Blumea balsamifera, D. C.
A substitute for sage.

Sp. 3. C. alopecuroides. Martinique, diuretic.
Syn. Pterocaulon alopecuroideum, D. C.

In this order is included by Feé and several other writers the tribe Asteraceæ, which has been separated by De-

candolle into a distinct family. Though few are quite inert, none are of much value. Some are acrid, others afford considerable quantities of potash on incineration. The only species quoted by Feé is the *Solidago virga-aurea*, (golden rod) Europe, reputed to be astringent and diuretic.

The tribe SENECIONEÆ, are also generally unimportant. The following are specified by Feé :—

S. vulgaris, France, emollient, a popular but useless vermifuge.

S. Jacobaea, of the same qualities.

Feé however notices, though with extreme brevity, some species of Cacalia, which as well known, and we believe useful Indian remedies, we find it necessary to advert to.

GEN. 13.—CACALIA.

Sp. 1. *Cacalia sonchifolia.*

Syn. Emilia sonchifolia, D. C.

Vern. Shudimudi, *Beng.* Udiram panum, *Sans.* Palla camudie, *Malay.*

A decoction of this plant is deemed antifebrile on the Malabar coast.

Sp. 2. C. Kleinia.

Vern. Lisan ulsaur, *Arab.* Gao Zuban, *Pers.*

The leaves resemble the tongue of the buffalo, and the stalks are prickly and covered with white spots. While fresh the leaves have a strong smell like hemlock, they are given in decoction in rheumatism, syphilis, and lepra, indeed in the class of cases in which sarsaparilla is usually employed by European practitioners. In Bombay they seem to be highly esteemed (*see* Bombay Committee's report in the Journal of the Medical and Physical Society of Calcutta.) We find the article common in the Bazars, and think it deserving extensive trial from a few experiments we have made with it ourselves.

The tribe TUSSILAGINEÆ are European plants of little or no energy. The following seems the only article worth notice.

GEN. 14.—TUSSILAGO.

Sp. T. Farfara. Coltsfoot.

Βηχιον, Diosc.

Europe. Inodorous, slightly styptic and bitter. The leaves and flowers are bitter and mucilaginous. A popular remedy

for cold as a sudorific in infusion or decoction; hence its name *tussilago*, or cough resolver.

The tribe ARNICEÆ are European plants, chiefly found in hilly regions, and having usually splendid yellow flowers. Their properties are very active, and they produce violent effects on the stomach and nervous centres. The roots of the *Doronica* are poisonous, and in the leaves of the Arnica has been detected the poisonous principle *cytisine*, first found in the *Cytisus Laburnum*.

GEN. 15.—ARNICA.

Sp. Arnica montana. Wolfsbane.

Syn. Doronicum montanum.

A native of mountainous pasturages in Europe. The stalks are cylindrical, velvety, about 15 inches high, simple and unifloral, or branched, and with several flowers. Roots horizontal, brownish, vivacious, the size of small quills, very fibrous. Leaves oval, entire, obtuse, sessile, or attenuated into linear petioles, very finely ciliated in the margin, smooth and trinerved above. Flowers terminal, solitary, pedunculated, erect, yellow and very large; calyx common, imbricated; scales linear, lanceolate, sessile, corolla radiated, florets ligulate, lanceolate, treble the length of the calyx, spread out, limb toothed.

The whole plant has a strong irritating smell, especially just before drying, and which causes violent sneezing. The taste is herbaceous, acrid, and rather bitter. Powder a violent sternutatory. The flowers are blanched by time, and attacked by insects. Other synanthereous plants afford flowers so like those of the arnica that they are often mixed in the druggist's shops in Europe.

According to Chevallier and Lassaigne (*Journ. de Pharmacie*, t. v. 248.) the flowers of the arnica contain odorous resin, *cytisine*, gallic acid, yellow colouring matter, albumen, gum, and saline and earthy matters of no importance. The medical properties of the article are due altogether to the presence of cytisine. This principle is nauseous, bitter, brownish yellow, neutral, and uncrystallizable. Small doses in Chevallier's experiments killed various animals with vomiting and convulsions. Eight grains taken by a man in four doses brought on giddiness, violent spasms, and frequency of the pulse, lasting for two hours, and followed by exhaustion, (Christison on Poisons, p. 842). The same principle

exists in the seeds of Cytisus laburnum, and Dr. Christison details two very serious cases of poisoning produced thereby in boys who had swallowed the seeds.

An *unfiltered* infusion of the arnica flowers causes violent vomiting through the mechanical irritation of little particles of down suspended in the fluid. On filtering these are removed, and vomiting is no longer occasioned by moderate doses. The powdered root, in five to ten grain doses, almost certainly occasions vomiting.

In small doses the various parts of this plant, especially the flowers, are stimulating, and somewhat astringent. In paralytic cases the remedy is described as producing effects analogous to those of nux vomica. In excessive doses all the symptoms of acrid poisoning are induced, accompanied or followed by deep coma, or extreme anxiety, convulsions, and death. Vinegar is said, on doubtful grounds, to be the best remedy for these symptoms. In Dr. Trail's dangerous cases, quoted by Christison, emetics and stimulants were resorted to with success.

Paralysis, rheumatism, and amaurosis are the diseases in which the arnica has been most usefully employed. It has been given, but with very questionable results, in fevers, dysentery, uterine inaction, and many other diseases.

Dr. Duncan recommends the infusion of two scruples in a half pound of water, and taken in divided doses. For the reason above specified the infusion should be carefully filtered.

The *Doronicum Pardalianches*, or leopard's bane, produces very powerful effects, resembling those of the arnica. The *D. plantagineum* has similar properties. Both are natives of the Alps, but have not been employed in medicine in Europe.

Of the tribe, EUPATORIEÆ but one species has been found in Europe, the majority of the genus being American. In general they are odoriferous and bitter, especially the *E. Aya-pana* and *perfoliatum*; the latter much used at New York as a febrifuge remedy.

GEN. 16.—EUPATORIUM.

Sp. 1. *E. cannabinum*, a native of Europe. Taste bitter and aromatic, roots purgative.

Sp. 2. *E. Ayapana*—Brazil and Bengal.
Vern. Aya-pana, *Beng.*

Stalks straight, firm, nearly simple or slightly branched, brown, slender, about three feet high—leaves almost sessile, lanceolate, very entire, smooth, contracted into a petiole at the base, nerves little prominent, loosely reticular, nearly longitudinal, inferior leaves opposite, superior alternate. Flowers purple in a terminal corymb.

Odour slightly aromatic, agreeable, and balmy. Taste aromatic, astringent, and bitter. By Cadet de Gassicourt's analysis the stems and dried leaves appear to yield brown aromatic extract, volatile oil, gallic and benzoic acids.

The infusion is very agreeable, resembling that of the coarser varieties of tea. The plant has had immense celebrity, and has been used in fever, cholera, tetanus, snake bites, and other most dangerous cases. All the romances about its extraordinary virtues are now however exploded; and we know it only as an agreeable and useful diaphoretic and gentle tonic.

The *E. perfoliatum*, or *bone-set*, possessed of greater bitterness and less aroma, is stated to be employed with much success as an antiperiodic in the intermittent fevers of the United States of America.

NAT. ORDER LXXX.—CAMPANULACEÆ.

Includes only herbaceous plants of sweet taste, and destitute of medicinal properties.

NAT. ORDER LXXXI.—LOBELIACEÆ.

Some of this family are acrid and narcotic, especially those of warm and hilly climates. The juice sometimes yields caoutchouc of great purity.

GEN. 1.—LOBELIA.

Sp. 1. *Lobelia inflata*, Indian tobacco.

A native of the United States; an acrid narcotic, and violent emetic; in small doses diaphoretic and expectorant. A popular remedy in the United States, where from incautious use it has often proved fatal. Its chief employment is in asthma, and in the form of enema in strangulated hernia. It is emetic in doses of 10 grs. to 1 drachm of the powdered leaves and capsules; of the tincture 1 to 4 drachms; as an expectorant 1-10th of these doses is given, and repeated every second or third hour.

It is unquestionably a remedy of very great power, and though of recent introduction is now very generally used in Europe and America.

Sp. 2. L. syphilitica, United States.

Action similar to that of L. inflata. The root has been used in the treatment of syphilis, but its utility is not decidedly proved.

Two closely allied plants, the *Lobelia longifolia* of Linnæus (Hippobroma longif. Don) and the *Lobelia Tupa*, Lin. (Tupa Feuillæi, Don), are possessed of still more potent qualities, and may be classed among the most violent of acrid poisons. Both are natives of the West Indies.

Roxburgh describes three Indian Lobeliæ. The generic character is as follows:—

Calyx 5-cleft, corolla 1-petalled, irregular, anthers united, capsule inferior, 2 or 3-celled.

Sp. 1. *L. nicotianifolia.* Erect, leaves sub-sessile, lanceolar, acute, entire, raceme terminal. A stout tall species, occurring in the vicinity of Bangalore.

Sp. 2. L. trigona. Annual, base creeping, erect parts three-sided, leaves sessile, cordate, serrate, peduncles axillary, longer than the leaves, one-flowered. A small annual ramous plant which delights in wet pasture ground, and appears during the wet and cold seasons. Stems near the root creeping, above erect, ramous, three-sided, smooth, the whole plant is from six to twelve inches high, leaves sub-sessile, cordate, grossly serrate, smooth. Peduncles axillary, solitary, erect, the length of the leaves or longer, two bracted at the base. Flowers small, blue, corolla inserted in the mouth of the calyx.

Sp. 3. L. radicans. Annual, creeping, smooth. Leaves sessile, lanceolate, remotely serulate. Peduncles axillary, solitary, twice the length of the leaves, one-flowered. Accidentally introduced from China into the Calcutta Garden, where it flowers during the rains; small, much branched, spreading over the ground, and sending forth roots from each branchlet. Flowers large, pink coloured, segments of corolla unequal, unilateral and narrow, lanceolate, with two green glands under the two middle sinuses opposite to the long green two-lobed stigma.

We have instituted numerous experiments on the last species, but found it to be altogether inert.

NAT. ORDER LXXXII.—VACCINIEÆ.

Small shrubs with alternate leaves, simple and axillary flowers; stalks and flowers usually astringent, and rich in tannic acid. Fruits generally acidulous and agreeable. The leaves of some species are provided with glands secreting resin, and in these the leaves are also bitter.

NAT. ORDER LXXXIII.—RHODORACEÆ, OR RHODODENDRA.

Plants allied to the heaths (Ericeæ), shrubs, rarely trees, with simple, alternate, rarely opposite leaves, the edges of which are rolled up during immaturity. The family is suspected of possessing dangerous properties.

GEN. 1.—KALMIA.

Sp. K. latifolia. A poisonous plant, native of Virginia and Carolina. The flowers exude a secretion on which bees and wasps feed, and which renders the honey of the former powerfully intoxicating.

GEN. 2.—RHODODENDRON.

The *R. ferrugineum* is common in the Alps, where it often proves a poison to goats and sheep; several other species are enumerated. The leaves of all have been used in small doses in chronic rheumatism, gout, and syphilis. The effect is stimulant and narcotic. The *R. arboreum* of the Himalayas has doubtless similar properties.

The leaves of *R. campanulatum* are imported from Thibet and Cashmere, under the names *Burg-i-tibbut* and *Hoolas Cashmeree*, and used by the natives as a snuff. The leaves of *R. aromaticum* (of Royle), are highly fragrant and stimulating; they are brought from Cabul, and called *Talesfur*. (*Royle's Illustrations*, p. 259.)

The brown dust found adhering to the petioles and seeds of the kalmia and rhododendra of the United States is also used as a medicinal snuff.

GEN. 3.—AZALEA.

The *A. pontica* of Colchis and Mingrelia yields a dangerous honey, celebrated in Grecian history.

Gen. 4.—Ledum.

Sp. L. latifolium (Labrador tea) a little shrub, a native of the cold provinces of North America. Its odour is aromatic and resinous, the infusion of the leaves stomachic, but induces giddiness if too strong. The Ledum palustre has in every respect similar properties.

NAT. ORDER LXXXIV.—ERICACEÆ. (*Heaths.*)

Lovely shrubs, most abundant at the Cape. All seem inactive, or at most but of slightly astringent and diuretic properties. Still the following species are entitled to attention.

Erica vulgaris, common heath of the north of Europe, diuretic, and used in tanning leather.

Andromeda polifolia, used instead of gallnuts in the silk factories of St. Petersburgh.

Pyrola rotundifolia, astringent.

Pyrola umbellata, Winter-green.

Syn. Pipsissewa, Chimaphila corymbosa.

A perennial evergreen found from Canada to Georgia, taste bitter and astringent, contains tannic acid, gum, and resin. Astringent, tonic, sudorific, and diuretic.* It is described as especially active in the last named property, combining a speedy diuretic with much tonic power. It is given in the same mode as the plant next described.

Gen.—Arctostaphylos.

Sp. Arctostaphylos Uva ursi. Bear's whortle berry.

Syn. Arbutus Uva ursi.

Common in France and Ireland. The infusion is astringent and aromatic, and is used with excellent effect in the treatment of chronic gleet and catarrh of the bladder, in some kinds of gravel, and in diarrhœa. It is much used by British practitioners; the powdered leaves are also employed in doses of five grains to a scruple, every second or third hour, taken with water.

Under the head of "*doubtful,*" Feé here inserts the *Penæa Sarcocolla,* Lin. now of the (*Natural order* Penæaieæ.)

* See *Bigelow's American Botany,* ii. p. 15. t. 21. for an excellent account and figure of this plant.

A native of Ethiopia and of the Cape of Good Hope, which produces the peculiar substance called—

Sarcocolla.

Sarcocolla (Ungeroot, *Arab.* Runjudeb, *Pers.* Dioscor. lib. iii.) is yellow, or reddish, like gum arabic, in oblong globules, the size of a pea or of grains of sand, friable, opaque or demitransparent, softening, but not melting by heat; sp. gr. 1·268. According to Pelletier it contains pure sarcocolline 65·30, gum 4·60, gelatinous matter 3·30, woody fibre 26·80 per 100. Sarcocolline is half transparent, crystalline, brittle, like gum, soluble in 40 parts of cold water and 25 of boiling water, soluble also in alcohol. Odour weak and peculiar, taste saccharine and slightly bitter; composition, carb. 22, hyd. 19, oxy. 10, atoms.

Sarcocolla was once deemed a powerful healer of wounds (σαρξ flesh, and κολλα glue), but this idea has been long abandoned.

It is rarely met with in India, and then only brought from Persia and Arabia. Mesue regarded it as cathartic.

We have now reached the third sub-class Corolliflorae, distinguished by the corolla being monopetalous, bearing the stamens, and inserted into the receptacle. The *Ternströmiaceæ* mentioned at page 224, should have been inserted in this subdivision.

Sub-class 3—Corolliflorae.

NAT. ORDER LXXXV.—SAPOTEÆ.

Trees or shrubs, with simple and alternate leaves, flowers solitary, or in fascicles at the axillæ of the leaves, gorged with a milky white juice.

No individual of this order is really dangerous, the juice being devoid of acrid or irritating properties. The barks of many species are astringent, the fruits pulpy, acidulous, and edible. The seeds contain an oil rich in stearine. The butter tree of India, and of Mungo Park, *Bassia butyracea*, is one of this family. It also contains the *Sideroxylon*, or iron wood. The *Achras Sapota*, Sapodilla plum, has delicious fruit with very bitter seeds, believed in Martinique

to be powerfully diuretic. The bark is deemed a substitute for cinchona, (see Lindley Fl. Med. p. 388.)

Gen.—Bassia.

Sp. Bassia longifolia, (Illupei tree,) *Roxb. Fl. Ind.* ii. p. 523. The fruit by expression yields a large quantity of oil, much used in India.

B. butyracea, *As. Res.* viii. 477. *Fulwa*, or *Phulwara* of Nepal and Almora.

B. latifolia, Madooka, *Sans.* (Mowa tree, Roxburgh) both yield oil abundantly.

The petals of the Mowa contain sugar, and are much used for the manufacture of a very intoxicating spirit.

The products of the Bassia trees deserve further investigation. The Fulwa butter is a soft solid at 95°.

NAT. ORDER LXXXVI.—EBENACEÆ.

Trees devoid of milky juice or resin, with alternate, entire, often coriaceous and shining leaves, flowers solitary or united at the axillæ of the leaves, the central system of the stem is coloured, of a deep black.

Gen.—Diospyros.

Sp. 1. *Diospyros Embryopteris.*

Syn. Embryopteris glutinifera. D. glutinosa, *Kön.*

Vern. Sindica, *Sans.* Gaub, *Hind.* and *Bengalee.* Jumika, *Tel.* Toombikai, *Tamul.*

Fruit about two inches in diameter, green when ripe, and farinaceous externally. On being pressed, an excessively astringent juice exudes. This is so powerful that it generally yields on analysis 60 per 100 of pure tannic acid. It is used in medicine as a valuable astringent and styptic, and is employed in Bengal for paying the bottoms of boats. The bark has been given with doubtful results in the treatment of intermittent fevers. See "*Extracts*," Pharmacopœia.

Sp. 2. *D. Melanoxylon*, ebony tree.

Vern. Kendoo, *Beng.*

Coromandel, Malabar, Ceylon, Midnapore jungles. Bark astringent, given by the native doctors with pepper in dysentery.

Sp. 3. *D. virginiana.* United States. Bark said to be powerfully astringent.

NAT. ORDER LXXXVII.—STYRACINEÆ.

Trees of variable elevation, with alternate, simple leaves without stipules, flowers axillary. The genus styrax is the only one in this order the medicinal properties of which have been duly examined. The species of *Symplocos* yield a valuable dye stuff called *lodh.*

GEN.—STYRAX.

Sp. 1. *Styrax officinalis.* Storax tree.

Trunk 20 feet high, branches covered with short down, leaves alternate, petioled, oval, glabrous, green above, cottony and white below; flowers white, large, pedunculate, united in little clusters at the ends of the branches; fruit a drupe, coriaceous, containing one to two kernels.

STORAX.—*Vern.* USTORUK, *Hind.*

This product occurs in three different forms—1. in grains; 2. in soft masses; 3. in brittle masses.

1. *Storax in grains*, the rarest and purest of all, in transparent, yellowish-white or reddish-yellow grains, the size of a small bean, the consistence of wax, and capable of consolidating into a thick mass. Odour strong, penetrating, and very agreeable. Taste aromatic and bitter.

2. *Storax in soft mass*, or amygdaloid storax (*Storax calamite*, Lemery) softer than the preceding species, easily fusible, with brown fracture, displaying almond-like yellowish tears. Odour very sweet, like benzoin, taste sweet and perfumed.

3. *Massive hard storax.* Light brown, yellow, and reddish brown, friable, sometimes slightly tenacious, softens under the teeth. Odour less than that of the two preceding varieties, and resembling balsam of Tolu; flavour sweet. This variety is very impure, being usually adulterated with sawdust, &c.

The better kinds of storax burn with a white flame, and give a light, spongy, carbonaceous residue. It communicates to water a yellow colour and fragrant smell. It is soluble (except the impurities) in alcohol and ether. By analysis storax affords resin, benzoic acid, and empyreumatic oil; from 480 grs. Neumann obtained alcoholic extract 360, watery extract 90, and inversely watery extract 120, alcoholic 240.

Storax is brought to Europe from Turkey in Asia; formerly it was packed in bulrushes, at present it is sent in bladders. M. Feé deems the origin of this drug uncertain; the styrax tree, cultivated in the south of Europe, affords no balsam, but this may be because the soil and climate differ from those of its native country.

The strong resemblance between this product and the balsam copalm produced by the Liquidambar styraciflua, led to the idea that storax might probably be secreted by some congenerous tree, and Bernard de Jussieu pointed out the Liquidambar orientale, a tree common in Syria, as the most likely source of the article. It is now, however, ascertained that storax is in reality produced by the Styrax officinale, a native of the Levant, Syria, Palestine, Greece, and the Peloponesus. Storax or styrax, (Greek στυραξ, Arabic *estorak*,) is a word of unknown origin.

Sp. 2. Styrax Benzoin. Benjamin tree.

Sumatra, Borneo, Siam, and Java.

A lofty tree loaded with rounded branches with whitish and downy bark. Leaves alternate, borne on rounded, striated, and downy petioles, oblong, entire, and pointed, veined, smooth above and downy beneath, flowers in axillary parcels, displayed and velvety, calyx campanulate, short, corolla with 5 linear, obtuse petals, reunited at their base, ovary superior, oval, style thin, stigma double.

Benjamin, or Benzoin.

Vern. Looban.* *Hind.*

In dry and hard grey masses, rather shining, brittle, formed of ovoid, whitish tears, like stripped almonds, and placed as it were in a cement of a greenish red porous mass. Fracture resinous. Sp. gravity 1092.

Odour sweet, peculiar, very agreeable, increased by friction, taste sweetish, subresinous, balsamic, irritating, powder yellowish grey, disposed to cake.

The analysis by Brande represents the composition of 100 parts of benzoin as, benzoic acid 9, acidulous water 5.5, empyreumatic oil 60, carbon and carburetted compounds 25.5. Bucholz' examination of 1500 parts gave, benzoic acid 187, resin 1250, substance resembling Peruvian balsam 25, peculiar aromatic principle soluble in alcohol and water 8, ligneous fibre 3. Bucholz' results correspond as nearly as

* In Upper India this is the name given to the resin of *Boswellia thurifera*, see page 283.

could be anticipated with our own examination of fine specimens of this substance. Undervorben describes three different resins as existing in benzoin. The points of difference are not important in a pharmaceutical point of view. With the resin generally sulphuric acid strikes a deep red colour.

Benzoic Acid.

Benzoic acid is readily obtained from the crude benjamin by either of the following processes—sublimation, or boiling with an alkali.

1. By sublimation—coarsely powdered benzoin is strewed on an earthen pot, a second pot is inverted over the first, and luted on with clay, or a cone of paper is substituted for the second pot, and heat is gradually applied. The benjamin fuses, boils, and the acid sublimes and condenses in fine feathery crystals, soiled by a little empyreumatic oil.

2. By boiling powdered benjamin with lime or carbonate of soda in a large quantity of water, filtering, and adding an acid, benzoate of the base is first formed, and the benzoic acid subsequently precipitated in a pulverulent form. The impure acid given by either of the above methods may be refined by a second sublimation, or by four or five times its weight of sulphuric acid diluted with six times its weight of water; heat, and when the solution is boiling add a very small quantity of pure animal charcoal, filter and allow the liquid to cool. The benzoic acid is deposited in fine crystals, next washed on the filter with cold water, and then dried in the shade.

Benzoic acid when pure is inodorous, melts at 248°, boils at 473°, sublimes readily, and condenses in beautiful satin-like needles and feathers. According to Liebig's analysis benzoic acid contains carbon 14 at., hydrogen 6 at., and oxygen 4 at., the crystals containing one atom of water. Its taste is pungent, and rather bitter. It is soluble in alcohol, and slightly in water.

Benzoic acid is a stimulant and diaphoretic remedy, of considerable power. It is used in the paregoric elixir (*see Pharmacopœia,*) and in several formulæ for the treatment of chronic cough. It is also an ingredient in court plaster. Its principal consumption is for the manufacture of fumigating pastiles, and for incense in religious ceremonies.

The Styrax benzoin occurs chiefly in Java and Sumatra. The balsam is obtained by incisions practised in the trunk of the tree after it has attained the age of five or six years. The resin is white, and transparent at first. About 3 lbs.

are given by each tree, for six years. Benjamin is a word of Hebrew origin. It is most likely that the Hebrews applied the term to some other similar balsam, and that it has in the lapse of time been adopted for the present article.

NAT. ORDER LXXXVIII.—JASMINEÆ.

This order embraces three groups—the Olives, Jasmines, and Lilacs.

Olive Tribe—Oleineæ.

Trees or shrubs, with simple, thick, stiff leaves, flowers usually inodorous, with fleshy fruit saturated with a sweet fixed oil. Some of the trees also afford a peculiar resin; the leaves are rich in gallic acid. The bark of the root in some species is astringent and styptic.

Gen.—Olea.

Sp. Olea europea. The Olive.

A native of Spain, Italy, and Sicily, and generally cultivated extensively along the coasts of the Mediterranean.

The fruit is perfectly oval, rounded at both ends, about one inch long, smooth, shining green, its sarcocarp fleshy, succulent, covering an oval, oblong, rugose, pointed nut, marked with longitudinal furrows of ash colour; almond white, and compressed. Inodorous, taste rough, modified by salting.

Olive Oil.

Olive oil is of pale yellow colour, greenish in one variety (*virgin oil*), freezes some degrees below zero; composed of carbon 77.21, hydrogen 18.36, oxygen 9.43. Specific gravity 0.913; easily saponified, nearly inodorous. Taste sweet, analogous to that of the fruit, if the oil is extracted immediately after the fruit is gathered.

By long exposure to the air it absorbs oxygen, and rancid acids are formed.

Olive oil is often adulterated with the oil of poppies. Poutet describes a test by which he states the adulteration may be detected; 8 parts of liquid nitrate of mercury when mixed with 92 parts of *pure* olive oil solidify completely in a few hours; should the oil contain even one-twentieth of the oil of poppies a soft mass only is obtainable. These experi-

ments are however only available in India during the nights of the cold season. M. Rousseau states that olive oil is inferior to all other bodies in its power of conducting electricity, and proposes an instrument he calls the Diagometer, to test the rapidity with which an electric current traverses the oil. We have frequently tried the method, and find it requires so much care, time, and dexterity, that we do not regard it as one of general utility.

The principal use of olive oil is as an aliment; it is consumed extensively too in soaps, cerates, liniments, plasters, &c.

According to the mode of expression, the quality of the oil varies considerably; *virgin oil*, the product of the perfectly recent fruit, is of greenish colour, and highly esteemed; *common olive oil* results from the expression of the fruits after they have undergone a slight fermentation. It is yellow, sweet, and well suited for culinary purposes. The oils inferior to this are consumed almost exclusively in the fabrication of soap, and are obtained by subjecting to the press a second time the crushed fruits which have already yielded the first and second qualities of oil.

The finest olives and the worst oil are produced in Spain.

The oil of the Sesamum orientale, of the arachis, and of the poppy, are perfect substitutes for the olive oil for medicinal and pharmaceutical uses.

Olive Resin,

occurs in tears, or rather large masses of reddish-brown colour, sometimes containing half-transparent nodules like those seen in benzoin, fracture resinous and conchoidal, becomes highly electric by friction, inodorous, but when burning diffuses an agreeable vanilla-like perfume. According to Pelletier it contains a peculiar substance which he calls *Olivine*, brown resin, and benzoic acid.

Olivine is a white, brilliant, starch-like, sometimes crystalline powder, fusible at 70 *centigr.* into a very transparent mass like resin, in this state it is electric; olivine is more soluble in cold than in hot water; nitric acid dissolves it, acquiring a deep red colour. Inodorous, taste bitter at first, then sweet, and slightly aromatic.

Theophrastus and Pliny state that the olive resin was the basis of an important medicine named Euhæmon.

Sp. 2. Olea fragrans, (Thunberg, Fl. Jap. t. 2,) a native of China and Japan; its flowers evolve a most delicious odour, and are sometimes used to perfume teas.

Tribe Lilaceæ—Lilacs.

Shrubs or trees with simple or compound leaves, dry fruits, flowers in thyrsi, or in parcels at the axillæ of the branches.

The genus Fraxinus (ash) which belongs to this sub-order, affords a saccharine juice which concretes in the air, and is called *manna*. The flowers are fragrant; the leaves of the *lilac* strongly bitter. The *Cantharis vesicatoria*, or blistering fly, finds its favourite pasture on the leaves of some species of this tribe.

Gen. Fraxinus.

Sp. 1. *Fraxinus rotundifolia.* (*Syn.* Ornus rotund :) round-leaved Manna ash tree, a native of Calabria and Sicily.

Sp. 2. *Fraxinus florifera.* (*Syn.* Ornus flor :) flowering ash, mountains of the south of France.

To these two trees, and probably to other species also, we owe the manna of the European druggists.

Manna.

Vern. Shirkisht, *Hind.*

Var. Manna in tears, Calabrian manna.

This occurs in fragments the length of a finger, uneven, wrinkled, brittle, resembling stalactites, light, porous, and pulverizable, white, with traces of bark on one side. Examined by the microscope it is seen to be composed of an assemblage of minute crystals.

Manna is devoid of odour, of sweet, mild, and rather heavy taste, dissolves entirely in the mouth, it becomes yellowish or red by time, is sometimes adulterated with sugar, soluble in thrice its weight of cold water and in an equal weight of boiling alcohol, from which there separate on cooling crystalline stars like flakes of snow. These crystals constitute the peculiar principle of this substance, and are termed *mannite;* manna also contains ordinary sugar, a yellow nauseous and purgative substance, with minute quantities of gum.

Mannite is solid, inodorous, highly crystalline, very soluble in water and in hot alcohol. The watery solution does not undergo the vinous fermentation. Composition—carbon 12 at., hydrogen 14 at., oxygen 12 atoms.

Manna is a mild purgative frequently employed, especially for children and delicate females. It is apt to gripe, however, and requires to be taken in large quantities.

Some authors divide mannas into the Oriental and European. The former are chiefly the produce of the *Alhagi Maurorum* (see Leguminosæ.) The latter include with the ash-manna of the present article another kind called Briançon manna, secreted on the larches and pines of that country by an insect. The ash-manna is called Italian or Calabrian, according to its local source. In commerce we find besides the kind described at the commencement two others, namely the manna in *sorts*, and *fatty* manna.

The manna *in sorts* is the produce of Sicily, and occurs in lumps or irregular masses of the same composition and properties as the first kind, but more liable to adulteration; it generally ferments and spoils in a year.

Fat manna, in soft adhesive impure masses, is of very little use or value.

Besides these the Calabrians specify several other varieties—the *spontaneous* and *forced*, and also manna of the *leaves* and of the *trunk*. The juice exudes from the trees in the hot weather, during June and July, the discharge commencing in the middle of the day, and continuing till evening. During the night the juice concretes, and in the morning the masses are detached. Towards the end of July the natural discharge ceases, and incisions are then practised. The syrup-like juice now flows with more abundance than ever, concretes as before, and constitutes the *forced* manna. The leaf manna is scarce, and resembles much the turunjabin of the alhagi. An ash tree may produce all the above varieties for more than 40 years.

Sp. 3. *Fraxinus excelsior*. Europe.

Bark bitter and astringent, once called European cinchona, but very undeservedly. Its leaves are purgative. A little manna sometimes exudes from the trunk.

The fruits are in England preserved in vinegar as a pickle. The blistering fly feeds with avidity on the leaves of this species.

The genus *Syringa* is remarkable for the beauty and fragrance of its flowers. The seeds are said to be astringent, and to contain also a bitter principle.

The genus *Ligustrum* has bitter and astringent leaves, and coloured berries, used in dyeing wines. The bluish colour they yield is very much admired.

Tribe—Jasmineæ.

These are shrubs with very flexible branches, flowers aromatic, leaves astringent. The perfume is very fugacious, and apparently does not depend on essential oil. It cannot be communicated to water or spirit, but the fixed oils imbibe it readily.

GEN.—JASMINUM.

Sp. Jasminum officinale.

The only use is for the preparation of a perfumed oil, with the fixed oil of the *moringa*, and of which Dr. Jackson has given an interesting account in a paper drawn up for this work, and published by the Editor in the Journal of the Asiatic Society for 1839.

The *Nyctanthes arbor tristis*, (*Vern.* Hursinghar) is well known for the delicious though evanescent perfume of its flowers.

NAT. ORDER LXXXIX.—STRYCHNEÆ.

This order contains but a few trees, but these of high importance, being amongst the most formidable of vegetable poisons; India and the Eastern Islands constitute the residence of the group. Their action on the system is marked by peculiar, and terrible symptoms. These effects are due to the presence of the vegetable alkalies—strychnine, and brucine, and of another substance hitherto not thoroughly examined.

GEN. 1.—STRYCHNOS.

Gen. character. Calyx 4—5 parted, corolla tubular, with a spreading 4—5 cleft limb, and valvate æstivation; stamens 4—5, inserted into the throat of the corolla, which is either naked or bearded; ovary 2-celled, with indefinite ovules attached to a central placenta; style one; stigma capitate; berry corticated, one-celled; many-seeded, or by abortion one-seeded; seeds undulant, and discoidal; albumen large, cartilaginous, almost divided into two plates, embryo with leafy cotyledons.

Sp. 1. *S. Nux-vomica.*

Vern. Yettie cotay, *Tam.* Musada, *Tel.* Culaka, Cutaka, also Veshamoostibeejum, *Sans.* Kuchila, *Beng.* Koodaka doruatta, *Cing.* Koochla, *Duk. Hind.* Khanek ul kelb, *Arab.*

Off. Bark and seeds.

A native of Coromandel, Ceylon, and the Bengal jungles, especially near Midnapore; trunk short, often crooked, but pretty thick. Branches irregular, covered with smooth ash-coloured bark, young shoots highly polished, deep green, wood white, hard, close grained, and bitter. Leaves opposite, short stalked, oval, shining, smooth on both sides, from 3 to 5 nerved, or rather between that, and triple or quadruple, differing in size from 1½ to 4 inches long, and from 1 to 3 broad. Flowers small, greenish white, collected in small terminal corymbs. Calyx 5-toothed, permanent; filaments scarcely any, or exceedingly short, inserted over the bottom of the divisions of the corolla; anthers oblong, half within the tube, and half out. Ovary 2-celled, with many ovules in each cell, attached to the thickened centre of the partition, style the length of the tube of the corolla, stigma capitate, berry round, size of a small orange, with a smooth, hard shell of a beautiful orange colour when ripe, filled with white, gelatinous pulp, in which the numerous seeds are immersed. All parts of the plant, except the pulp and flowers, are exceedingly bitter, especially the wood of the root, and the inner layers of the bark. *Roxb. Fl. Ind.* i. 475.

The *seeds* are plano-orbicular, about a line in thickness, 6 to 8 lines broad, somewhat arched, hard, leathery, marked with a prominent umbilicus on one side and a depression on the other; they are horny and white, and semitransparent, sometimes by age becoming dark and opaque; covered with fine ash-grey or yellowish-grey shining divergent and silky hairs. The seed is inodorous, but its taste insupportably acrid and bitter.

It is very difficult to reduce the seeds to powder; they must be first rasped, the raspings steeped in mucilage, then dried and powdered; or what is preferable, the raspings should be exposed to the steam of water for an hour, and then stove-dried, and powdered in a covered mortar.

The *bark* is of ash-grey colour while young, thin, compressed, inner surface black, outer surface of the larger pieces spotted with red rust-like patches. Fracture brittle, taste intensely bitter; nitric acid gives a blood-red stain to the black parts, and changes the red to a rich grass green. This bark is known to the European druggists under the name of the "*false augustura.*" Its nature was long suspected, but first clearly ascertained by the Editor of this work, (see the Journal of the Medical and Physical Society of Calcutta, Jan. 1837). The same bark is commonly sold in Calcutta, under the name of "*Rohun,*" and substituted for the harmless bark of the *Soymida febrifuga.*

According to Pelletier and Caventou's analysis the seeds of the S. N. vomica contain the alkali strychnine, with traces of brucine, an acid they termed the *igasuric*, since named the *strychnic*, a yellow colouring substance, concrete oil, gum, starch, wax, and bassorine.

Strychnine.

Strychnine crystallizes in minute four-sided prisms, terminating in pyramids with bevelled edges. It is unalterable in the air, neither fusible, nor volatile, carbonized at a comparatively low temperature; 6677 parts of water only dissolve 1 of strychnine at 60° Faht. and this even in this minute proportion renders the solution very bitter. With acids strychnine forms crystalline and neutral salts. By nitric acid it is decomposed, and a deep blood-red solution is formed. It is altogether devoid of odour.

Strychnine is so poisonous that half a grain destroys a rabbit in five minutes in violent paroxysms of tetanus. Dr. Christison has killed a dog in two minutes with the one-sixth part of a grain dissolved in spirit and injected into the chest, and he has seen a wild boar killed in the same manner with the third of a grain in ten minutes. It acts most energetically when injected into a vein.

Brucine.

Brucine occurs in scaly crystals, resembling talc flakes or boracic acid. It is contained in small quantities in the nut, but to the extent of about 2—3 per 100 in the full grown bark. It is soluble in 850 parts of water, combines with and neutralizes acids, forming crystalline salts. It is inodorous and very bitter, but not so much so as strychnine. In action on the living system they are identical in nature, although they differ so much in intensity that strychnine is twelve-fold more powerful than brucine. It is reddened by nitric acid, and the red colour changed to a beautiful violet by a little of the solution of the proto-chloride of tin.

100 parts contain

Strychnine, C. =30. H. = 2. Az. =1. Ox. =3. ats.
Brucine, C. =32. H. =18. Az. =1. Ox. =7. ats.

The *strychnic*, or *igasuric acid*, possesses no important properties.

Effects on the living system.

Strychnine, brucine, the nut, bark, and their extracts, with several of the like products of congenerous species agree in

producing effects on the animal economy, which, when they amount to actual poisoning, Dr. Christison thus succinctly, but most accurately describes.

" The symptoms produced are very uniform and striking. The animal becomes agitated and trembles, and is then seized with stiffness and starting of the limbs. These symptoms increase till at length it is attacked with a fit of violent general spasm, in which the head is bent back, and the spine stiffened, the limbs extended and rigid, and the respiration checked by the fixing of the chest. The fit is then succeeded by an interval of calm, during which the senses are quite entire, or unnaturally acute. But another paroxysm soon sets in, and then another and another, till at length a fit takes place more violent than any before, and the animal perishes suffocated. The first symptoms appear in 60 or 90 seconds when the poison is applied to a wound; when it is injected into the pleura I have known them begin in 45 seconds, and Pelletier and Caventou have seen them begin in 15 seconds; M. Bouillaud has recently found that it had no effect when applied directly to the nerves." *Christison on Poisons*, p. 797, 798.

Death however does not always take place by tetanus, for in some cases the convulsions have totally ceased, and been succeeded by general and fatal collapse.

The chief action of all these poisons is manifestly on the spinal chord. The irritability of the heart seems also to be diminished by their influence.

When taken in very small or medicinal doses, all this class agree in proving at first stimulant and tonic, the appetite is remarkably improved, the powers of digestion increased. The secretions are rendered more copious and regular, sexual feelings are unusually excited, and cheerfulness of spirits often induced. After a variable period tremors, startings, and often cramps of the limbs occur, with a sensation of prickling or creeping, and should the remedy be any longer persisted in, fits of tetanic spasm take place. It is remarked moreover that in patients labouring under paralysis, general or local, that the paralysed parts are the first to experience these effects.

Habit will however enable persons to take very large doses of all these poisons. Mr. Baker, lately a surgeon on this establishment, has published an interesting paper on this subject in the Trans. of the Medical Society of Calcutta; he says—" The natives of Hindostan often take the kuchila nut morning and evening, continuously for many months, beginning with the eighth of a grain, and gradually increasing

the dose to an entire nut, or about 20 grains. If taken immediately before or after meals no unpleasant effect is produced, but if this precaution be neglected spasms are apt to ensue."

The morbid appearances in fatal cases are variable and inconclusive. In some cases portions of the cerebellum and spinal chord have undergone softening. In others, these organs are unusually vascular, in many altogether unchanged. A few instances are on record in which the stomach and small intestines exhibited signs of violent irritation and inflammation. In some individuals the body becomes rigid immediately after death, and seems as it were fixed in the tetanic spasm.

The smallest doses known to have proved fatal to man are three grains of the alcoholic extract of the kuchila nut, and 30 grains of the powdered nut. But from the formidable symptoms occasioned both in man and animals by much smaller medicinal doses, it seems very likely that fatal effects might follow far inferior quantities to those now specified.

Medicinally, nux-vomica and its preparations have been chiefly employed in paralysis, local or general, in rheumatism, and neuralgia, in intermittent fever, in convalescence from acute diseases, as a stimulant in sexual impotency, and to prevent incontinence of urine. It has also been given, with alleged advantage, in atonic dyspepsia, and in amenorrhea.

Before we venture to administer any of the strychnine preparations in paralysis we must first ascertain the absence of inflammatory action in the cerebro-spinal system, and if possible convince ourselves of the non-existence of organic disease or change of structure in these organs. The conditions now alluded to are deemed by all experienced practitioners extremely unfavourable to the use of these agents.

In suitable cases we may commence the treatment with the following doses, repeated thrice daily:—

Powdered nut, (Koochila),...	one grain.
Alcoholic extract of Nut, ...	quarter grain.
Do. do. of Bark, ...	half grain.
Powdered leaf of Strychnos parasite,	one to two grs.
Muriate or other salt of Strychnine,...	one-tenth grain.
Do. do. of Brucine, ...	one quarter gr.

A gentle aperient of castor oil, or extract of kaladana may be advantageously given every third day. It generally happens that within a week twitchings or creepings of the paralysed parts supervene, when we must omit the remedy

for two or three days, and then resume it as before. Under this treatment we have witnessed the perfect recovery of many cases of paralysis, some even of very long duration.

In the disease called amaurosis, or defective vision, proceeding from impaired functions of the retina, when independent of organic disease, much good has been accomplished in a few cases by the use of these preparations, according to what has been called the endermic method. This consists in applying a minute portion, say one-fourth of a grain of a salt of strychnine or brucine, or a grain of the alcoholic extract, with some inert and soft powder (flour) to a surface of the skin made raw by the action of a blister. This surface may be about the size of a rupee, and the dressing should be renewed daily.

The same precepts apply to the doses and use of these remedies in the other diseases we have mentioned. As a febrifuge the strychnine class is possessed of indisputably great power, being often known to cure obstinate agues where every other remedy had failed. But they can only be used with safety and advantage when the patient is free from organic disease, such as of the liver and spleen; they do decided mischief where the stomach and bowels are in an irritable or inflamed state. In the remittent form of fever with cerebral symptoms they have been but seldom tried, and we believe are dangerous in the extreme.

On the whole the physician possesses few remedies of greater value, none of superior power, and scarcely any so formidable, as this class affords. The utmost skill is required in deciding as to the cases in which they should be used at all, and the greatest care in the course of their administration. Should too violent symptoms appear, large doses of opium or extract of hemp, leeching of the temples and a blister to the spine, the warm bath with diluent drinks and aperient enemata are the measures to be most relied on. Emetics are only of use in case of too large doses having been taken, and symptoms of immediate poisoning being induced. In such cases the stomach-pump may sometimes be had recourse to with the best effects.

Sp. 2. S. Sancti Ignatii. St. Ignatius' bean.
Syn. Ignatia amara.
Vern. Papeeta.

A branching tree, a native of the Philippine islands. Flowers white, smelling like jasmine. Fruit large, pear-shaped, dry, one-celled, many seeded, covered with a very

smooth, woody rind, rather like that of some of the gourds. It contains about 20 seeds, applied one to the other.

The seeds are an inch long, (the size of a large olive) irregularly flattened, convex at one side, angular at the other, marked with striæ or rays, usually ash-coloured and spotted, with a whitish, very adherent dust. By close examination they are found to be covered with a yellowish down. Internally they are horny, and remarkably hard, towards the summit they present an umbilicus shewing the point of attachment of the seed. Inodorous, extremely bitter, nevertheless readily attacked by worms.

According to the analysis of Pelletier and Caventou, these beans contain igasurate (strychnate) of strychnia, wax, concrete oil, yellow colouring matter, green starch, bassorine, and vegetable fibre. The strychine is present in three times the quantity of that in the kuchila nuts, but there is no brucine. Its activity is consequently very great, its uses the same as those already mentioned under the preceding head. Besides the symptoms therein described, the papeeta nut purges in small doses, and is hence deemed, and we believe correctly, to be an efficacious vermifuge medicine.

Sp. 3. *S. colubrina.*

Vern. Modira canoram, *Rheede.* Naga musada, *Tel.* Malabar and Ceylon.

Off. The wood, (lignum colubrinum.) Pao de Cobra.

A climber with stem of great size, often from 8 to 12 inches in diameter, wood hard, intensely bitter, and of light grey colour. Bark ash-coloured. Tendrils lateral and simple, leaves opposite, short, petioled, in shape ovate to oblong, entire, obtusely acuminate, triple nerved. Corymbs terminal, small, flowers small, greenish yellow. Bractes one under each division and sub-division of the corymb, tapering, villous, calyx 5-parted, with clammy, glandular pubescence; corolla infundibuliform, smooth, tube cylindrical, border 5-parted. Filaments five, short, ovary superior, ovate, smooth, two-celled, with ovules in each, attached to a fleshy ridge down the middle of the partition, style the length of the corolla. Stigma capitate, berry often as large as an orange, round, the rind hard and brittle, bright yellow to dull brown, pulp gelatinous and yellow, seeds 2 to 12, orbicular, shield-like, about an inch broad. Exterior integument of seed covered with soft short hairs like fine velvet. *Roxb.*

The wood of this plant is the true Pao de Cobra of the Portuguese. That of the root is deemed a powerful remedy for the bite of the cobra capella. Several species of

wood have however received the appellation of *Bois de couleuvre*, (Lignum colubrinum) in different countries, viz. the Ophioxylum serpentinum in Amboyna, the Ophiorhiza mungos in Java, Polygala senega in North America, &c. &c. all for their supposed virtues as antidotes to snake poison.

A very large proportionate quantity of strychnine exists in the wood of this root.

Sp. 4. *Strychnos potatorum*, Clearing nut tree.

Vern. Nirmullee, Induga, Titancotta, *Beng.* and *Hind.*

A large tree found among the mountains of Bengal, flowers during the hot season, occurs in gardens in many parts of India. The leaves are opposite, from ovate to oval, smooth, pointed, corymbs small, in ternary order, with numerous small, erect, fragrant, greenish-yellow flowers; berry shining black when ripe, one-seeded. The wood is hard and durable, pulp when ripe eaten by the natives. The ripe seeds are sold in the Bazars for clearing water. The entire plant is destitute of the poisonous ingredients of the other species.

By rubbing the nuts round the inside of water-pots, the impurities very soon fall to the bottom. This effect is so generally known that the seeds are usually carried by travellers in India. The nature of the action has not been clearly ascertained. It probably depends on astringency in the fruit.

Ainslie informs us that the ripe fruit is deemed emetic by the Tamools of Southern India, when given in powder to the quantity of about half a tea spoonful.

Sp. 5. *Strychnos toxifera.*

A native of Guiana, ascertained to be the basis of the celebrated Woorara poison.

Sp. 6. *Strychnos Tieute.* (Tshellik or Tjettik.)

A native of Java, a large climbing shrub; an exceedingly violent poison, which acts exactly in the same manner as strychnine, is prepared from the bark of the root of this tree. The root is called Upas Radja, but does not belong to the true Upas tree of Java, which is the Antiaris toxicaria of the Nat. Order Urticaceæ.

Sp. 7. *S. ligustrina.*

Caju-alar, Caju-nassi, Caju-badaira pail or laut. Malayan archipelago.

A tree resembling the orange tree; berries globose, yellowish green, two to eight seeded. This yields the *Lignum colubrinum* of Timor, used for the objects already described.

Sp. 8. *S. pseudoquina.*

Brazil, considered by A. de St. Hilaire to be the best febrifuge in Brazil, all parts except the fruit being extremely bitter, and rather astringent. It is universally employed instead of cinchona. It contains neither strychnine, brucine, nor quinine.

Gen. 2.—Carissa.

Sp. Carissa Carandas.

Vern. Kurunda, *Hind.*

This species is a marked exception to the generally poisonous nature of this family, the acid fruits affording the well known and favourite caranda jelly of our tables.

NAT. ORDER XC.—APOCYNEÆ.

This important and very extensive order is composed of trees, shrubs, and even some herbaceous plants. The leaves are opposite or alternate, the inflorescence exceedingly variable. An acrid principle combined with a milky juice containing caoutchouc pervades the family; tannic and gallic acid are also occasionally present. A few species from which the acrid principle is absent or separable are used as articles of food.

While the stalks of the annual plants of this order have little or no activity, the roots of the perennial species, on the contrary, are of great energy. Their chief action is emetic, but the species contain no emetine. The woody stalks and the bark also frequently contain active principles; when the fruit is a berry, it is usually milky, and participates in the general properties of the plant. If the fruit be dry it is generally inert, or at least of inconsiderable energy.

The Apocyneæ usually occur in tropical countries. In India they are chiefly found in the peninsula, and the southern parts of Bengal as far as Sylhet, extending to Burmah and the Malayan peninsula.

Gen. 1.—Nerium.

Sp. 1. *N. Oleander.* The oleander, rose bay, or spurge laurel. Νηριον Ροδοδενδρον, Ροδοδαφνη. Diosc.

Vern. Karzahra, *Hind.*

A native of the warm parts of Europe, of Asia Minor, and the lower Himalayas, common in gardens in Bengal.

The stalks are numerous, 6 to 9 feet high, branches long, straight, leafy, smooth, with greenish bark, leaves ternate linear, lanceolate, pointed, entire, smooth, coriaceous, stiff, green, traversed by a medium, whitish, very decided nerve; flowers large, handsome, purple or bright red (or white) disposed in umbellate cymes. Corolla monopetalous and infundibuliform.

The whole plant is impregnated with a dangerous principle which has not as yet been insulated, though many attempts have been made to procure it. Its activity and volatility are very great; it is even a popular belief that the vapour of the flowers in a close apartment will prove poisonous.

Externally the leaves and bark have been used (and sometimes even internally) as a remedy in herpes and itch. The rasped wood is employed as ratsbane. The wood itself is used by some eastern nations as the best material for gunpowder charcoal.

Sp. 2. *N. odorum.*

Vern. Kurrubee. *Hind.* Common in gardens in every part of India.

Corolla hypocrateriform, the orifice surmounted by lacerated multifid processes, segments of the limb contorted, filaments inserted into the middle of the tubes, anthers sagittate, adhering by the middle to the stigma, ovaries 2, style filiform, dilated at the apex. Stigma obtuse, some teeth at the bottom of the calyx on the outside of the corolla, follicles cylindrical, leaves linear, lanceolate, three together, segments of the calyx erect, anthers bearded at the point, flowers white or red. (*Roxb. Fl. Ind.* ii. p. 2.)

The bark of the root, and the fragrant leaves are used by the native Indian practitioners as powerful repellents applied externally. The root is very poisonous.

The *N. piscidium* of Dr. Roxburgh is used for its tough fibres, and contains a narcotic principle which proves pernicious to fish inhabiting tanks in which the fibres are steeped.

Gen. 2.—Wrightia.

Sp. 1. *W. antidysenterica.*

Syn. Nerium antidys :—Echites antidys : *Roxb.*

Vern. Tiwaj and Lisan ul-asafeer, *Arab.* Anduraroon, *Greek.* Seeds called *Indurjuo shereen*, or the mild, to distinguish them from seeds of *Holarrhena pubescens*, and *Antidysenterica*, called *Indurjuo tulkh*, or the bitter.

A native of the coast of Malabar, of Ceylon, and the Isle of France, and common in many parts of India.

A small shrub, leaves ovate oblong, or exactly oblong, shortly acuminate, smooth, bright green on each side.

Corolla hypocrateriform, throat surmounted by ten lacerated scales, stamens projecting, inserted into the throat, anther 1, sagittate, adhering by the middle to the stigma, ovaries 2 adhering, style filiform, dilated at the apex, stigma narrower, follicles distinct or united, 5 to 10 scales at the base of the calyx on the outside of the corolla; corymb terminal, few flowerets, corolla white, very sweet-scented, with a slender tube $\frac{3}{4}$ of an inch long, limb spreading, flat, with obovate segments, follicles very long and slender. (*Lindley.*)

The bark (conessi bark) is astringent and bitter, and also deemed febrifuge. The seeds, *Indurjuo*, are intensely bitter, and used as a vermifuge.

Conessi bark has been given with much alleged advantage in chronic dysentery. The infusion seems the best form, 4 drachms of the dried and powdered bark being infused in 8 ounces of hot water for an hour :—dose one ounce thrice daily.

W. tinctoria is indigenous over a tract of 1000 miles, its leaves yield the finest indigo. Being perennial, hardy, and luxuriant, this is considered by Roxburgh the best for cultivation of all the indigo-bearing plants.

Gen. 3.—Cerbera.

Gen. char. Calyx permanent, five-parted, leafy, corolla hypocrateriform, tube clavate, throat five-angled, with five scales, limb five-parted, contorted, stamens five, short, in the middle of the tube, drupe with a hard, woody, fibrous half seeded putamen. (*Lindley.*)

Sp. 1. *C. Tanghin*, Madagascar.

Nut filamentous and woody, albumen none, the kernel said to be a formidable poison; it was used in Madagascar for the trial by ordeal, but the practice is now discontinued.

Sp. 2. C. Manghas.

A common plant in the East Indies, occurring in wet situations. The leaves are broad, lanceolate, stalked, smooth, entire, clustered at the ends of the branches. Racemes terminal, branched, unequal, calyx with lanceolate, coloured deciduous leaves, corolla white, with a tube longer than the calyx, and a limb shorter than the tube, anthers ovate, quadrangular, covered by the wool of the tube. Drupe as large as a goose's egg, ovate, green, marked with numerous white points, compressed, seeds two, an inch and a half long by $\frac{3}{4}$ in diameter. (*Lindley.*)

The kernels are described by Lindley as emetic and purgative. Waiz states that the leaves are used in Java as an excellent substitute for senna. The milky sap is also said to be purgative; the properties of all parts of the plant deserve most attentive investigation.

Sp. 3. C. Ahovai, properties as in the last species.

Sp. 4. C. Thevetia, milk poisonous, bark bitter and purgative, also said to be powerfully febrifuge, "two grains being affirmed to be equal to a common dose of cinchona." Perfectly naturalized in India, according to Royle.

Gen. 4.—Ophioxylon.

Calyx 5-cleft, permanent, corolla funnel-shaped, tube long, thickest in the middle, limb spreading, five-cleft, oblique, anthers subsessile, inserted into the middle of the tube, ovary double, each lobe with one ovule, style filiform, enclosed, stigma capitate, drupe berried, two, by abortion solitary, each with a wrinkled one-seeded nucleus. (*Lindley.*)

Sp. O. serpentinum.

Vern. Chandra, *Beng.* Chota Chand, *Hind.*

Various parts of India, see Roxb. Fl. Ind. i. p. 694.

The stems are woody, erect, climbing, and twining, leaves in threes or fives, short stalked, oblong, pointed, wavy, entire, smooth, 4-5 inches long. Fascicles axillary, peduncled, many flowered, peduncles long, smooth, round, sometimes nearly erect, sometimes drooping. Pedicels and calyces bright red, corolla white.

Root used as a febrifuge, as an antidote to snake poison, and to *promote delivery* in tedious cases. *Lindley,* p. 532.

Gen. 5.—Alyxia.

Sp. A. stellata, Malay Archipelago, Society and Friendly islands.

Bark contains benzoic acid, and is possessed of properties analogous to those of canella and winter's bark; now used in Germany in chronic diarrhœa and nervous disorders. *Lindley.*

Gen. 6.—Willoughbeia.

Sp. W. edulis. Roxb. Fl. Ind. ii. p. 57. Forests of Chittagong and Sylhet.

Vern. Lutiam.

A very large climber; every part of the plant on being wounded discharges an abundance of fluid caoutchouc.

The fruit is pulpy, soft, and yellow, and esteemed by the natives.

Gen. 7.—Allamanda.

Sp. A. cathartica. Cayenne, Guiana, and coasts of Brazil, introduced by Lord Auckland into the Botanic Garden, but previously naturalized, according to the statements of Royle. A climbing milky shrub, leaves in fours, subsessile, ovate oblong, ferruginous beneath, with white hairs on the veins, flowers fascicled, axillary, yellow, large and showy, with villous, dichotomous, rigid peduncles.

The leaves a valuable cathartic, used especially in painter's colic. In too large doses violently emetic and drastic.

Gen. 8.—Vinca.

Sp. V. pusilla.

Syn. V. parviflora. Roxb. Fl. Ind. ii. p. 1. Common in the East Indies.

A small erect annual, stem smooth, 4-sided, 6 to 12 inches high, leaves lanceolate, flowers small, white, axillary, in pairs, mouth of corolla closed with hairs.

Applied in India as an external stimulant in lumbago. *Royle.*

Gen. 9.—Apocynum.

Sp. A. androsæmifolium. Dogsbane.

United States. Milky, root bitter, while fresh emetic, when dried, tonic in small doses.

Sp. A. cannabinum, also emetic; in decoction diuretic and diaphoretic.

Gen. 10.—Ichnocarpus.

Sp. I. frutescens, Ceylon.

According to Royle, sometimes used in India as a substitute for sarsaparilla.

Gen. 11.—Hasseltia.

Sp. H. arborea, Java.

Milk mixed with honey used as a powerful drastic in tape worm. A dangerous remedy.

Gen. 12.—Vahea.

Sp. V. gummifera, Madagascar, yields caoutchouc.

Gen. 13.—Urceola

Sp. U. elastic, Roxb. As. Res. v. 169. Sumatra and Pulo Pinang. A large woody climber, yields caoutchouc of the finest quality in great abundance.

Gen. 14.—Plumieria.

Several species of this genus, natives of Jamaica, Surinam, Brazil, the Malayan Archipelago, and Cochin China, are used as drastic cathartics. *Plumieria acuminata* is abundant and luxuriant in the Pinjore valley. (*Royle.*)

Gen. 15.—Cameraria.

Sp. C. latifolia, Jamaica, Cuba, and St. Domingo (Bastard manchineel.)

Yields a great abundance of milk, is reputed to be very poisonous, but its properties are not distinctly ascertained.

Gen. 16.—Tabernaemontana.

Sp. T. utilis, Hya Hya, Demerara milk tree. Milk harmless. *Lindley.*

Gen. 17.—Holarrhena.

H. pubescens. Roora.

Wood light. This species and the *H. antidysenterica* yield the *Indurjuo tulk* of the bazar. (See *Wrightia*, p. 447.)

NAT. ORDER XCI.—ASCLEPIADEÆ.

This order has been recently separated from the Apocyneæ, to which it is nearly allied. They differ entirely in the sexual apparatus. In Asclepiadeæ the whole of the sexual apparatus is consolidated into a single body, the centre of which is occupied by a broad stigma like a gland, and the grains of pollen adhere in the shape of waxy bodies, attached to the five corners of this stigma by the intervention of particular glands. The pollen coalescing into masses fixed or applied to processes of the stigma in a determinate manner, constitutes the determinate character of this order. *Lindley Intr. to Nat. Syst.* p. 212.

The family chiefly abounds in the south of Africa, in India, and New Holland.

Their properties are generally active, all secrete a milky juice of an acrid stimulating kind; valuable emetic, cathartic, diuretic, diaphoretic, and alterative remedies are afforded by its numerous and abundant species.

Gen. 1.—Cynanchum.

Sp. 1. *C. monspeliacum.* Montpelier scammony.

A native of the south of France, having herbaceous, smooth, cylindrical, and creeping stalks, oval rounded leaves, deeply notched, whitish small flowers in corymbs, fruits follicular and single celled.

This species affords the Montpelier or French scammony, a black, hard, compact, resinous substance, of peculiar smell, and nauseous disagreeable taste. It is obtained by subjecting the recent plant to the press and inspissating the juice by heat. In action it resembles the true scammony, but requires to be given in much larger doses. Its chief consumption is for the adulteration of the valuable scammony of the East.

Sp. 2. *C. Argel.* Upper Egypt.

The leaves are elliptic, entire, pointed, an inch long, very smooth, thick, of pale green colour above and still paler below, nearly sessile, of nauseous odour, bitter, nauseous and acrid taste. In small doses these leaves are purgative, and they are much used in Egypt for adulterating senna. (see that article.) The Indian, or Tinnevelly senna is not liable to this adulteration, to which many practitioners attribute the severe griping which senna often occasions.

Sp. 3. *C. Ipecachuana*, Mauritius Ipecachuana.

A root procured from the Mauritius, and subjected to analysis by Pelletier. Its emetic properties are well established, but it requires to be given in double the dose of the true ipecachuana; great difference of opinion exists as to the plant by which it is supplied. The article does not occur in commerce, though it may probably be identical with the root of the next species.

Sp. 4. *C. Vincetoxicum.*

Syn. Asclepias Vincetox: *Feé.*

Sandy places in most parts of Europe. The roots are oblong, cylindrical, plane, horizontal, creeping, short, ash-coloured, covered with numerous fibres; odour strong, taste acrid and disagreeable. On analysis Feneuille found the roots to yield resin, mucilage, starch, jelly, fixed oil, malates of potash and lime, and an emetic extract differing from *emetine.*

In large doses the powder of the root is emetic, and it is said purgative also. The specific name of the plant refers to its supposed efficacy as an antidote to poisons.

The *C. ovalifolium* of Penang, yields abundance of very fine caoutchouc.

Feé here enumerates the Asclepias laniflora, curassavica, syriaca, asthmatica, lactifera, and spiralis. Some of these will be noticed under other heads.

Gen. 2.—Secamone.

Sp. 1. *S. emetica.*

Syn. Periploca emetica, *Retz.*

Southern parts of the peninsula of India at the foot of mountains; common; a smooth twining shrub, leaves short stalked, veinless, smooth, varying from elliptical to narrow lanceolate, cymes interaxillary, shorter than the leaves. Flowers very small, greenish; follicles slender, pointed, corolla rotate, coronet five-leaved, pollen masses 20 erect, attached by fours to the point of each unfurrowed corpuscle of the stigma. (*Lindley*, p. 544.)

Roots acrid and emetic.

Sp. 2. *S. Alpini.*

Syn. Secamone, (*Prosper Alpinus.*)

Stem twining, shrubby, smooth, leaves lanceolate, elliptical, stalked, smooth, paler beneath, with transverse veins. Panicles axillary, dichotomous, shorter than the leaves, flowers minute, white, hairy inside. A drastic purgative.

The *Smyrna* scammony has been attributed to this plant on very insufficient grounds.

Feé here notices briefly—*Periploca græca*, a rather violent poison—*P. esculenta* (the Asclepias rosea of Roxb. Fl. Ind. ii. p. 40,) common on the continent of India, said to be eaten by the natives—also *Periploca Mauritiana*, thought to yield the false ipecachuana of Bourbon, the *Katapal-valli* of Rheede.

Gen. 3.—Asclepias.

Calyx five-cleft, very small, corolla volute, with a short tube, and a five-parted or reflexed limb, coronet of appendages five-leaved, leaves cucullate, fleshy, erect, with a horn proceeding from within each; pollen masses attached by a taper point. Stigma depressed, not pointed. (*Lindley.*)

Sp. 1. *A. tuberosa.* Butterfly or pleurisy root, United States.

The root is expectorant and diaphoretic, used in catarrh, inflammation of the lungs, and pleura. Bigelow regards it as a mild tonic and stimulant.

Sp. 2. *A. decumbens.* Similar properties.

Sp. 3. *A. curassavica.* West Indies and tropical parts of American continent.

Stem about three feet high, corolla scarlet, herbage downy. This plant is called wild ipecachuan in the West Indies, where the negroes use it as an emetic; roots purgative. A decoction is given in fluor albus and gleet.

Gen. 4.—Calotropis.

Corolla somewhat campanulate, with angular tube, and a five-parted limb, the angles saccate internally, coronet of appendages five-leaved, leaflets carinate, attached vertically to their tube, revolute at base, anthers terminated by a membrane, pollen masses compressed, pendulous, attached by a narrow point. Stigma not pointed, follicles ventricose, smooth. (*Lindley.*)

Sp. 1. *C. gigantea.* Mudar.

Syn. Asclepias gigantea, *Linn.*

Vern. Madorius, *Rumph.* Ericu, *Rheede.* Arka, Akund, *Sans.* Ashur, *Arab.* Ak, Mudar, *Hind.* Jumakioos, *Greek.*

A large shrub common in many parts of India, and extensively cultivated in the Calcutta Botanic Garden. The

stem is often as thick as a man's leg, nearly erect, branched, abounding in acrid milky juice, bark ash-coloured, young shoots downy. Leaves opposite, decussate, subsessile, embracing the stem, broad, cuneate, obovate, bearded on the upper side where they end in the petiole, upper surface pretty smooth, under one very woolly, leaf 4 to 6 inches long, 2 to 3 broad; umbels generally simple, sometimes compound, stalked, peduncles round, woolly, alternately coming from between the opposite leaves, nearly erect, half the length of the leaves, involucres several with oblong pointed scales, flowers large, beautiful, rose and purple coloured, calyx five-parted, corolla two inches in diameter, segments oblong, obtuse, revolute, reflexed at the point. (*Roxb.*)

The root, bark, and inspissated juice are used extensively for their emetic, diaphoretic, alterative, and purgative properties which have been known for many centuries to the Indian practitioners, and have of late attracted much notice from European physicians.

The milk when dried on the water bath loses 75 per 100. The residue yields to alcohol 17, and then to water 4 parts. The watery extract prepared previously to the action of alcohol is 11 grs. The alcoholic tincture is precipitated by water, yielding a white resin. The alcoholic extract in doses of 10 grs. acts as a powerful but uncertain cathartic, and frequently causes violent vomiting; we have used it in an extensive series of trials, and do not regard it as a remedy on which reliance can be placed.

The dried bark of the root is of greyish yellow colour; heavy and very peculiar smell, acrid, nauseous. It yields to water at 70° 15 per 100 of gummy saccharine matter, and a peculiar extractive principle, which has the singular property of gelatinizing as it is heated, then liquefying again, and as the solution cools gelatinizing as before. This principle is termed *mudarine* by its discoverer Dr. Duncan, at whose chemical and clinical experiments thereon the Editor was present.

The powdered bark of the root in doses of from ½ a drachm to one drachm proves emetic after an interval of from 20 minutes to an hour, generally causing much nausea, and in about one case in every three inducing a cathartic operation. In doses of from 2 to 5 grs. taken every half hour, it proves nauseant, powerfully diaphoretic, and after several doses gently cathartic. On the whole this preparation may be deemed one of our best substitutes for ipecachuana, producing similar emetic and diaphoretic results; combined with opium it affords a good representative of the Dover's powder of the British Pharmacopœiæ. In dysentery it may be very

safely substituted for ipecachuan in Mr. Twining's, and other formulæ, about twice the quantity being used in each dose.

In Indian medicine the powdered root, bark, and the dried milk are used in small doses in a multitude of disorders, and enjoy high reputation as alteratives in the treatment of lepra, elephantiasis, secondary syphilis, and in several spasmodic diseases. The clinical experiments of Mr. Playfair, Dr. Duncan, and Dr. Royle, leave no doubt of the bark of the root being really efficacious in incipient leprosy, and in numerous diseases of the skin. Dr. Playfair's Essay occurs in the Transactions of the Med. Society of Calcutta. The results of Dr. Duncan's chemical experiments appear in the "Lancet," vol. 1829-30.

Sp. 2. Calotropis procera. Persia and Arabia.

Syn. Asclepias procera, *Hort. Kew.* Ascl. gigantea. *Bot. Rep.* Beid-el-sar. *Prosper Alp.*

Vern. (See next species.)

A shrub, much resembling the last, juice extremely acrid, used to remove hair from the skin, and as an external remedy in ring worm, and several other cutaneous diseases. A kind of manna named Shukr-ul-ashur is produced on this or some nearly allied species by the puncture of an insect called *Gultigul,* (Royle, Illustr. p. 275.)

Sp. 3. C. Hamiltonii, Wight.

This is the most common species in the upper provinces, and obtains the same native names as the true mudar. By Dr. Royle's experiments and those of the Editor of this work the bark of the root and the dried milk possess similar properties to those of the C. procera; we consider it however far inferior as an emetic remedy. According to Dr. Wallich this and C. procera are the same species.

Gen. 5.—Hoya.

Corolla rotate, five-cleft, coronet of appendages depressed, five-leaved leaflets, fleshy, spreading, with the inner angle extended into a tooth lying upon the anther, anthers terminated by a membrane, pollen masses fixed by the base, converging, compressed. Stigma not pointed, follicles smooth. (*Lindley.*)

Sp. H. viridiflora.

Syn. Asclepias volubilis, *Roxb. Fl. Ind.* ii. p. 36.

Vern. Nakchikni, *Hind.*

Coromandel, Sylhet, Neilgherries. Leaves opposite, stalked, ovato-cordate, pointed, membranous, smooth, 3 to 4 inches

long. Petioles 1 to 2 inches long, umbels lateral or axillary, simple, many flowered. Flowers numerous and green, corolla flat, crown of appendages turbinate, truncate, anthers reflected over the stigma. Follicles horizontal, obtuse, 3 to 4 inches long, 4 in circumference; root and young shoots used as alteratives; leaves with oil form a popular cataplasm applied by the natives to boils in all stages.

Gen. 6.—Tylophora.

Sp. T. asthmatica.
Syn. Asclepias asthmatica.
Vern. Untamol, *Hind.*

We have noticed elsewhere the C. ipecachuana of Willdenow, which by many writers is supposed to be the same as the present species, and which is common in Bengal.

The root is of many long, thick, whitish, fleshy fibres, issuing from a small woody head, stems several, twining, slender, round, from 6 to 12 feet long, young parts downy; leaves opposite, petioled, linear, cordate, ovate, all entire, smooth above, downy below, 2 to 3 inches long, petioles about half an inch long, channelled, umbels solitary, axillary and alternate, generally compound, peduncles and pedicels twice the length of the petioles, round, downy. Involucres lanceolate, flowers numerous, small, colour orange yellow, corolla flat, divisions oval, follicles lanceolate, spreading, 3 or 4 inches long, about 2 in circumference. (*Roxb.*) The dried roots of this article are of very great value, and according to the experience of Drs. Roxburgh and Anderson, confirmed fully by our own trials, afford an excellent substitute for ipecachuana, if given in rather larger doses.

Gen. 7.—Sarcostemma.

Sp. S. glaucum. A milky twining plant, used in Venezuela instead of ipecachuana.

Gen. 8.—Hemidesmus.

Corolla rotate, with five pointless scales inserted below the sinuses. Filaments connate at the base, distinct at the upper end, inserted into the tube of the corolla, anthers cohering, separate from the stigma, beardless, simple at the point. Pollen masses 20, granular, attached in fours to a solitary reniform appendage of each corpuscule, stigma flat-

tish, pointless, follicles cylindrical, very much divaricating, smooth. Seeds hairy. *W. A.*

Sp. H. indicus.

Syn. Periploca Indica, *Wild.* Asclepias Pseudosarsa, *Roxb. Fl. Ind.* ii. 39.

Vern. Ununtamul, *Hind.* and *Beng.*

Common all over the Indian peninsula.

The root is long and slender, with few ramifications, covered with rust-coloured very fragrant bark, the odour remaining after drying, and strongly resembling that of new mown hay. Stems twining, diffuse or climbing, woody, slender, the thickness of a quill, leaves opposite, short stalked, of variable shape, on the young shoots issuing from old roots, linear, acute, and striated; on the old, and superior branches, broad, lance-shaped, ovate or oval; all are entire, smooth, firm, and shining. Stipules four-fold, small on the side of each petiole, caducous. Racemes axillary, sessile, imbricated with flowers, and then with scales like bractes; flowers small, outside green, inside deep purple, calyx divisions acute, corolla flat, divisions oblong, pointed, inside rugose, follicles long, slender, spreading. (*Roxb.*)

The roots of this plant have been long employed on the Madras coast as a substitute for sarsaparilla, and have been also used in England, and very highly spoken of. Our trials here have been numerous and satisfactory. Its diuretic operation is very remarkable; two ounces infused in a pint of water, and allowed to cool, was the quantity usually employed daily, and by such doses the discharge of urine was generally trebled or quadrupled.

It also acted as a diaphoretic and tonic, and so increased the appetite that it became a most popular remedy in our hospital, the patients themselves entreating its administration and continuance. The taste and smell of the infusion are balmy and sweet; we have used it with the most decided benefit in numerous cases of the description in which sarsaparilla is generally given; indeed we consider the activity of this medicine to be much more decided than that of sarsaparilla itself.

The ununtamul can be purchased in Calcutta of good quality at from two to four annas the seer.

No good analysis has yet been made of this drug.

A volatile acid is described by Mr. Garden of London as having been obtained from the *Smilax aspera*, under which name it is thought our article became the subject of his experiments. This is however as yet doubtful.

Gen. 9.—Oxystelma.

Sp. O. esculentum.

Syn. Periploca esculenta.

Asclepias rosea. *Roxb. Fl. Ind.* ii. p. 40. Common in India on the banks of nullahs, used by the natives in decoction as a gargle in apthous ulcerations of the mouth, and in sore throat; cattle eat the roots. (*Royle.*)

NAT. ORDER XCII.—GENTIANEÆ.

This important order is formed of herbs or small shrubs, with opposite and entire leaves. In chemical composition the species correspond very closely, nearly all being powerful bitters, and many containing a large proportion of uncrystallizable sugar, from which alcohol may be manufactured. The gentians prevail in all climates and situations, especially in mountainous regions. The Indian species are about 60 in number.

Gen. 1.—Menyanthes.

Sp. Menyanthes trifoliata, water trefoil, buck bean, bog bean—common in Europe and North America, in marshes and peat bogs. All parts are intensely bitter, and are much used in popular medicine as a powerful bitter tonic and febrifuge. In some countries this plant is employed instead of hops as the bitter ingredient of beer.

Gen. 2.—Spigelia.

Sp. Spigelia marylandica. Indian pink.

A native of South America, of bitter, nauseous taste, and tea-like smell. Taken internally it causes vertigo and a kind of intoxication. The root is celebrated as a vermifuge, especially in cases of ascarides. It is given in doses of from 10 grains to a drachm, and also in infusion; in the larger doses it often proves purgative and emetic. It has also been recommended in irregular remittent fevers.

Feneuille has published an elaborate analysis of this plant, but his results are not of particular interest.

Gen. 3.—Chironia.

Sp. Chironia Centaurium. Lesser centaury.

A native of European meadows and pasturages, inodorous but intensely bitter, celebrated and very valuable where in-

digenous, as a tonic, vermifuge, and antiperiodic in the treatment of mild agues.

Gen. 4.—Gentiana.

Sp. 1. *G. lutea.* Gentian.
Off. The *roots.*

A native of the mountains of Europe, roots large, long, and branched, much wrinkled, or as it were withered after drying, of variable length and size, yellowish grey externally, decided yellowish red internally, and of spongy texture. Smell strong and peculiar, taste excessively bitter, powder yellowish. Sometimes the roots of congenerous species are substituted in commerce for the officinal article, but as all agree in their properties, this has no real disadvantage.

Several analyses of gentian root have been published; a yellow crystalline bitter principle has been described under the name of *gentianite;* but subsequent experiments have shewn that these crystals are an impure acid, and by careful management may be rendered quite tasteless. The acid is called the *gentisic.* The bitter principle has not yet been insulated. Gluten, oil, uncrystallizable sugar, a volatile odorous matter, gum, and fibre, constitute the ingredients of this root.

The gentisic acid is altogether devoid of any active properties. We mention the mode of its preparation for the guidance of those who may undertake experiments on any Indian plants of this order. The root is digested in successive portions of alcohol at 825°, until nothing more be taken up. Evaporate the tincture to an extract, treat this with water, which dissolves bitter extract, sugar, and an acid, and leaves a thick oil mixed with the acid and resin; act on this mixture with alcohol at 871°. This dissolves the gentisic acid with a little resin, and leaves the oil. By successive solutions and evaporations the acid is obtained pure. It is soluble only in 2000 times its weight of cold water, heat does not increase its solubility; with alkalies it forms very soluble yellow compounds, of which that with soda can be crystallized.

Boiling alcohol dissolves it, and minute yellow crystals are deposited as the solution cools.

In Switzerland a bitter liqueur is prepared by fermenting and distilling the sliced root, the alcohol being generated by the sugar it contains.

The distilled water is a strong narcotic, a table-spoonful being sufficient to occasion giddiness.

Gentian root is one of the most generally used bitter tonics, and is given in the form of infusion, tincture, and extract. Before the discovery of cinchona it held the first place among febrifuge remedies, and it is still deemed a very useful medicine in intermittent diseases. It is often added to remedies employed for other purposes, as to ipecachuana, and blue pill, in Mr. Twining's antidysenteric pills.

As well as the *Gentiana lutea*, several nearly allied species, possessed of the same properties, are used in various parts of the world. Lindley supplies us with notices regarding the following—

G. Catesbæi,	.. ..	North America.
G. Amarella,	.. ..	Chalky pastures in Europe.
G. campestris,	.. ..	Do. do.
G. purpurea,	.. ..	Norway, Switzerland, &c.
G. pannonica,	.. ..	Alps of the Tyrol.
G. punctata,	.. ..	European Alps.

Sp. 2. G. Kurroo.

Syn. Pneumonanthe Kurroo, *Don.* Royle's Illustrations, p. 278.

Mussooree, Simla, and other parts of the Himalayas.

Stems about one-flowered, leaves obtuse, the radical long, lanceolate, those on the stems linear. Teeth of calyx long, subulate, corolla funnel-shaped with an intense blue spreading 10-lobed limb, the principal lobes of which are ovate and acute, the intermediate ones have scale-like teeth.

The roots are used like the gentian in the north of India.

Gen. 5.—Agathotes.

Corolla withering, rotate, in œstivation twisted to the right, with glandular hollows protected by a fringed scale upon the segments. Anthers not changing, stigmas sessile, capsule conical, one-celled, with spongy placentæ upon the sutures, seeds indefinite, minute. (*Lindley.*)

Sp. A. Chirayta. (Don.) Chiretta.

Syn. Gentiana Chirayta, Flem. As. Res. xi. p. 167, Roxb. Fl. Ind. ii. p. 71. Wall. Pl. Rar. 3. p. 33. t. 252. Nepal and the North of India, Morung Hills.

Vern. Chirataka, *Sans.* Chirata, *Beng.* and *Hind.*

An annual, stems single, straight, round, smooth, jointed, branches generally decussated, nearly erect, with their extremities somewhat angular. Plant about 3 feet high, leaves opposite, amplexicaul, very acute, entire, smooth, 3 or 5 nerved ; flowers very numerous, stalked, the whole upper part of the plant forming an elegant oblong leafy decussated pa-

nicle; bractes two at each division of the panicle, and like the leaves but smaller; calyx 4-cleft, divisions linear, acute, permanent, corolla yellow, the limb spreading and 4-parted, with divisions as long as those of the calyx, and also permanent, stamens 4, anthers cloven at the base, style single, as long as the ovary, stigma large, 2-lobed, capsules rather shorter than the permanent calyx and corolla, 1-celled, 2-valved, opening a little at the apex. Seeds numerous, affixed to two receptacles adhering to the side valves.

The plant is gathered when the flowers begin to decay, and is dried for use. All parts are extremely bitter, and are identical in composition with the common gentian, containing, according to Battley, malic acid, bitter extractive, resinous matter, gum, and salts, (*Royle*, p. 277.) It is highly esteemed as a tonic and febrifuge all over India. The cold infusion is the form best suited for its use.

M. Guibourt and other French chemists having advanced the opinion that the chiretta is identical with the *Calamus verus*, or *aromaticus* of the ancients, M. Feé has controverted the arguments of Guibourt with great address and conclusiveness; Mr. Royle has also investigated it with his usual research and ability, and come to the same conclusion with M. Feé. Mr. Royle regards the chiretta as identical with the *Kusb-al-durireh* of Mathiolus, and the Calamus with the *Andropogon Iwarancusa*, which yields the fragrant "grass oil," of Nemaur.

Ophelia augustifolia, Don, (*Swertia*, Royle) is called Puharee chiretta in the hills, and is substituted for the true kind. The *Exacum tetragonum* is similarly named *Ooda chiretta*, or purple chiretta.

Besides the preceding articles, Lindley enumerates the following:—

Frasera Walteri, or carolinensis, North America, the root of which while fresh is emetic and cathartic, when dry bitter and tonic, and the roots of which have been brought to England under the name of American Colombo. *Cicendia hyssopifolia* (*Syn.* Exacum hyssopif:) common in various parts of the East Indies, the whole plant bitter, and used by the natives as a stomachic, being also somewhat laxative. The *Chlora perfoliata*, Europe, the properties of which are comparatively weak. The *Sabbatia angularis* and *gracilis* of the United States, excellent simple bitters. The *Lisianthus pendulus* of Brazil. The *Cutubea spicata* and *racemosa* of Guiana, and the *Villarsia nymphæoides* of Europe, the properties of all of which are identical with those of the preceding species. The Villarsia indica, aristata, and

nymphæoides occur in every part of India. The *Chironia centauroides* of Roxburgh (Erythræà Roxburghii, Don) is another and powerfully bitter species found in India.*

NAT. ORDER XCIII.—SOLANEÆ.

This is an order of very high interest, containing several of the most powerful and certain remedies in the Pharmacopœia. The plants of which it is formed are herbs, or small shrubs, with leaves alternate, simple, and rarely pinnate; the inflorescence is variable, flowers extra axillary, fruits capsules or berries. The properties of the order are variable, some species being alimentary, others formidable poisons, and from many of these active principles have been separated, which present, with slight chemical differences, the closest analogy of physiological and medicinal action, all being powerful narcotics, and producing a great degree of dilatation of the pupil. This principle may exist in various parts of the plant, as in the root of Atropa mandragora, the stalks of the Solanum dulcamara, the flowers and fruits of several Daturæ, and the seeds of the Hyosciamus.

When the roots are fibrous their activity is usually very great, if tuberculous they contain starch, and often prove alimentary. The woody stalks are usually of little activity, the herbaceous stalks however participate in the properties of the fruit. The leaves are generally narcotic, but vary much in power, according to circumstances of soil, climate, and cultivation. The fruits differ much in properties, all those which are dry or capsular are dangerous, the taste is nauseous, acrid, bitter, or pungent; while some of the berry fruits are very poisonous, others may be eaten with impunity.

Thus the Solaneæ may be considered to form three groups—1. that of which all the species are dangerous or suspicious; 2. that containing both poisonous and innocent species; 3. all the species of which are harmless or alimentary.

With reference to botanical affinities, the Solaneæ are closely allied to the Gentianeæ and the Scrophularineæ, in which the Digitalis occurs. They are chiefly found in the tropics, but many occur also in temperate or cold climates. The genera are very numerous, but the species of the genus "Solanum" exceed nearly all the rest in number.

* It is called "*Nye*," and much esteemed by the natives. For a small but characteristic specimen, we are indebted to Major Cox, 58th N. I.

Gen. 1.—Solanum.

Gen. character. Calyx permanent, 5—10 parted, corolla rotate, 4—5 or 6 divisions, anthers 4—6, converging into a cone opening by pores at the apex, fruit succulent, 2—6 celled. (*Lindley.*)

Sp. 1. *Solanum tuberosum,* Potatoe.

M. Feé devotes a long article to the history and consideration of this most important article of food. Our limits and objects do not permit us to follow him. It will suffice to say in confirmation of the analogies which pervade this order, that in the wild state the potatoe is bitter and acrid; that the leaves are generally very rich in potash, and that the roots even of the cultivated kind contain an acrid and narcotic principle dissipated by boiling. A very pure starch, resembling that of arrow-root, is readily obtainable from the rasped tubercles by the usual process of washing with cold water. This starch is easily convertible into sugar and alcohol by fermentation, and very large quantities of spirit are thus manufactured, especially in France.

Sp. 2. *S. Dulcamara.* Bitter sweet.

Off. Tops and twigs.

A native of temperate climates, a shrubby twining plant, with scarlet, oval, bitter and juicy berries. These are acrid narcotics, and poisonous in moderately large quantities.

The young stalks and tops have been much used in medicine as a diaphoretic and alterative, especially in the treatment of cutaneous diseases, and in asthma; in lepra, psoriasis, and similar affections, it is said to be employed externally with good effect. It is on the whole however an unimportant article, and not likely to be much prescribed in Indian practice.

An active principle, *Solanine,* has been discovered in the stalks of this plant by M. Desfosses. It is white, opaque, pulverulent, inodorous, unalterable in the air, not volatile nor fusible, insoluble in cold water, soluble in alcohol and ether, alkaline in reaction, but not producing crystallizable salts. In its physiological action it combines emetic and narcotic properties.

The Sol. Dulcamara, or a variety thereof, is found on the Choor mountain. (*Royle.*)

Sp. 3. *S. nigrum.* Waste places in most countries.

Vern. Arrub-ul-salib, employed as a narcotic by the Hakeems.

Stems herbaceous, 1 to 2 feet high, angular and branching, leaves solitary soft, oval, pointed, toothed, angular, green, smooth, rather decurrent, flowers in umbels, simple and pendant along the stalks. Corolla whitish, with a musky smell, 5-parted, berries black, round, shining, odour disagreeable, rather virose, taste herbaceous, insipid. (*Lind.*)

This species contains solanine united with malic acid, but is much less narcotic than has been generally supposed, indeed the leaves are in many countries eaten as salad. The fruits are very dangerous, and act in the same manner as those of the belladonna and mandrake. The extract of the whole plant, according to Orfila, acts like *lactucarium.*

M. Feé appends a brief notice of the following species:—

Sp. 4. *S. Lycopersicon.* Tomata, or love-apple, with large lobed, red berries, very succulent, containing much malic acid, and used in sauces.

Sp. 5. *S. Melongena,* (*Vern.* Begun) everywhere cultivated in India and Cashmere.

Fruits large, ovoid, firm, and innocent, insipid.

Sp. 6. *S. ovigenum,* or egg plant, is distinguished from *melongena* by its pulpy fruits, which are stated to be narcotic.

Sp. 7. *S. pseudoquina* of Brazil, having a bitter ingredient resembling that of colocynth, and as yet but imperfectly studied.

In Brazil, moreover, the fruits of *S. paniculatum, baccatum,* and *mammosum* are regarded as powerful diuretics, the bruised leaves, and unripe fruits of *S. paniculatum,* having much celebrity in the treatment of hepatic and visceral obstructions and in catarrh of the bladder. A decoction of the flowers and leaves of *S. cernuum* is also used in Brazil as a powerful and valuable sudorific in gonorrhœa and syphilis.

To these details we may add that the species of the genus Solanum are at least 400, of which about 30 occur in India, (*Royle*), and there chiefly in the southern parts.

Gen. 2.—Atropa.

Calyx 5-parted, permanent, nearly equal, corolla campanulate, with a very short tube, limb with 5 shallow nearly unequal segments. Filaments nearly as long as the tube of the corolla, anthers cordate, 4-lobed, stigma capitate, berry

2-celled, many seeded, imbedded by the enlarged calyx. (*Lindley.*)

Sp. A. Belladonna. Deadly nightshade.

A native of waste places and ruins in Europe. The plant is about 3 feet high, cylindrical, and branched, leaves alternate, often in pairs, short petioled, soft, very entire, and marked with nerves, flowers solitary and axillary, of livid red or purple colour, corolla bell-shaped, with 5 obtuse segments. Berry shining black, $\frac{3}{4}$ of an inch in diameter, soft, 2-celled, with numerous kidney-shaped seeds.

Leaves nearly inodorous, taste of the whole plant herbaceous, acrid, and slightly narcotic, of the berries sweetish and slightly astringent.

The roots are long, woody, rounded, several inches in diameter, divided into fibrous, greyish white, soft, and succulent ramifications, odour disagreeable and nauseous, taste sweetish and astringent.

The effects produced by belladonna and its preparations on the animal system are powerful and peculiar; great agitation, violent delirium, with wild laughter, convulsions, succeeded by total insensibility, constitute the usual train of symptoms, all of which are accompanied by extreme dilatation of the pupil. The effects are due to the presence of the formidable alkali—

ATROPIA,

discovered by Brande in 1819, but the properties of which have only been very recently studied with success.

We subjoin Mein's process for the preparation of this alkali, since it contains some important practical directions applicable to the procural of the analogous principles found in other species of this order.

Take 80 parts of belladonna roots reduced to fine powder and digest in alcohol of 830° for some days—strain, press, and treat the powder with alcohol again. To the filtered tinctures add one part of slaked lime in powder, allow the mixture to rest for 24 hours, and then filter; now add sulphuric acid drop by drop to slight excess, sulphate of lime falls, and is separated by filtration.

Distil off rather more than one-half of the tincture, dilute with eight parts of water, distil off the spirit cautiously till the liquid is reduced to one-third, then add a solution of carbonate of potash drop by drop as long as a precipitate is obtained; filter. The atropia is thus obtained as a gelatinous, partially crystalline mass, by allowing this to dry, pressing and dissolving in five times its weight of alcohol.

Filter; on adding six times its volume of water the atropia is deposited by spontaneous evaporation in the course of 24 hours in light yellow crystals.

1000 parts of the root yield by this process about three of atropia.

Pure atropia is white, crystallizes in silky fibres, inodorous, soluble in alcohol and ether, epecially when heated, soluble in 500 parts of cold, and freely in hot water. The solutions are bitter, alkaline, and if dropped on the eye instantaneously dilate the pupil.

Atropia is not volatile at 212°, but evolves vapours at a higher temperature; with acids it combines in definite proportions, and forms salts. According to Liebig's analysis it contains carbon 22, hydrogen=15, azote=1, oxygen=3 eqs.

Several crystalline salts of atropia have been obtained in which the base exists in the proportion of 24.47 to the combining number of the acid. The chloride of gold gives a yellow crystalline precipitate with solutions of atropia and its compounds.

The great superiority in the process just described consists in its avoiding the use of caustic alkalies, by which it is found that atropia is very readily decomposed.

The uses of belladonna in medicine are almost limited to its external application. This is of advantage in painful nodes and neuralgic affections, in tic doloroux for instance; small quantities of the extract have been introduced into the rectum in cases of schirrus or cancer, with the effect of great alleviation of pain. The utmost caution is however essential in such applications of this most formidable substance.

The uniform and remarkable effects produced on the iris by belladonna render its preparations of great value to the oculist in the management of several serious affections of the eye. Before the operation for cataract, for example, it is the usual practice to dilate the pupil by these preparations so as protect its inner edge from the needle or other source of injury during the depression of the lens. Again, where the iris is inflamed, and coagulable lymph is effused into the anterior chamber of the eye, the total closure of the pupil by adhesion of the iris is often prevented by dilating the pupil by belladonna, while mercury is administered to cause the absorption of the lymph.

A solution of a drachm of the extract in an ounce of water may be employed for this purpose, being dropped into the eye, or as is the more usual practice, a paste of the extract is rubbed on the eye-lids and over the eye-brow; the action

in the latter mode is slower, but as certain and effectual as when the remedy is more directly applied.

On a somewhat forced analogy the extract of belladonna has been recommended as an external and local application to the neck of the uterus when preternatural rigidity of the part opposes parturition, and also to the urethra for spasmodic stricture; cases are recorded of the alleged success of the latter practice, and it certainly merits repetition in careful hands.

Belladonna is in repute in Germany as an antidote against the contagion or virus of scarlet fevers, and some very striking proofs are adduced by Hufeland, and others, of its efficacy. The subject however is yet open to accurate investigation.

Diaphoretic and diuretic virtues are popularly ascribed to belladonna, but we possess so many powerful and safer remedies in these classes that we cannot recommend its use.

A. acuminata, (Royle) exists in Kunawur, on the northern face of the Himalayas. The *Mandragora*, or mandrake, the root of which was so celebrated in the magic rites and toxicology of the ancients, is known in the bazars of Central Asia and the north of India.* Its properties are identical in nature with those of the article above described, but weaker in consequence of drying and decomposition of the atropia.

Nicandra physalodes, Gaertn. (Atropa physalodes, Linn.) is also said to be diuretic.

Gen. 3.—Physalis.

Calyx 5-toothed, corolla campanulate rotate, plaited, 5-lobed. Anthers converging, opening longitudinally, stigma capitate, berry smooth, 2-celled, covered with the angular membranous inflated calyx. (*Lindley.*)

Sp. 1. *P. somnifera.*

Syn. P. flexuosa. Roxb. Fl. Ind. i.

Vern. Usgund, also Kaknuj, *Hind.*

A native of rocky places on the sea coast of the south of Europe, and the East.

Stems several, erect, shrubby, branching, and forked, round, downy, leaves in lateral pairs, short, stalked, ovate, a

* *Vern.* Ustrung, *Arab.* Merdum Seeah, *Pers.* Yebruj, *Beng.* Luckmuna, Luckmunee, *Hind.* These names are of very doubtful correctness, but are given on Ainslie's authority.

little scolloped, downy, 2 to 4 inches long. Flowers axillary, subsessile, crowded, small, greenish yellow or whitish, calyx ovate, pyramidal, greenish yellow or reddish. Corolla campanulate, berry red, smooth, size of pea. (*Roxb.*)

Supposed to be narcotic and diuretic, by some considered to be the *Strychnos hypnoticus* of Dioscorides; leaves steeped in oil are used as a poultice in India to inflamed tumors. (*Lindl.* p. 511.)

Sp. 2. P. Alkekengi, Winter cherry, Europe.

Berries red, shining, covered by the calyx, which is extremely bitter, taste of the berries acidulous, owing to the presence of malic acid. They are purgative and diuretic, and used in veterinary practice.

Gen. 4.—Capsicum.

Gen. character. Calyx 5-cleft, corolla rotate, equal. Filaments very short, equal, anthers converging, opening longitudinally. Fruit firm, succulent, 2-celled, containing numerous dry flat seeds not mixed with pulp. (*Lindley.*)

Sp. C. annuum.

Vern. Gach-mirich.

South America, Mexico, East Indies. Chillee, capsicum, cayenne pepper, red pepper.

An annual of dark green colour, almost smooth, 1 to 2 feet high, stem angular, furrowed, branched, leaves ovate or oblong, acuminate, long stalked, almost entire, sometimes hairy on the vein underneath. Flowers white, solitary, axillary, pendulous, with dark coloured anthers. Fruit of various forms, and either scarlet or yellow, in some scarcely pungent, in others intolerably hot.

Braconnot has shewn that capsicum contains the following ingredients:—

Starch, ...	9
Acrid oil, ...	1.9
Wax and red colouring matter, ...	0.9
Gum, ...	6.0
Azotized matter, ...	5
Salts of potash, ...	6
Lignin, ...	67.8
Muriate and phosphate of potash, ...	3.4
	100

The acrid oil has been called *Capsicin*, it melts when heated, and is then dissipated into fumes of such irritating properties that we are told "half a grain volatilized in a large room causes all who respire the air of the room to cough and sneeze." It is very soluble in alcohol, ether, and essential oils, and slightly in vinegar and in water.

Capsicum is of greater importance as a condiment than as a remedial agent. It possesses strong stimulating properties, and has been employed with success as a topical application to elongated uvula, and relaxation of the pendulous veil of the palate; made into a lozenge with sugar and tragacanth it is a favourite remedy for hoarseness with professional singers and public speakers. In putrid sore throat, whether symptomatic or strictly local, gargles of an infusion of red pepper are often very usefully employed.

In native formulæ we meet this ingredient constantly, especially in the prescriptions for gout, dyspepsia, cholera, and ague. The practice is doubtless good, and derived from long experience of the beneficial effects of this stimulant on the native of the East.

C. frutescens. Goat pepper, and bird pepper, (*lunka-mirich,*) has similar properties, but is more powerful. This species is extensively cultivated in Bengal.

Gen. 5.—Datura.

Gen. characters. Calyx oblong, tubular, five-angled, five-toothed, dropping from its base by a circular horizontal incision which remains permanently at the base of the ovary, corolla funnel-shaped, regular, angular, plaited with mucronate lobes, stigma thick, obtuse, two lobed, ovary four-celled, fruit dry, often prickly, half four-celled, with four valves and many seeds. (*Lindley.*)

Sp. 1. *D. Stramonium.* Thorn apple.

Vern. Datoora, *Beng.* (applied to other species.)

A native of waste places all over Europe.

A bushy, smooth, fœtid annual, 2 to 3 feet high, stem much branched, spreading, forked, leafy, leaves from the forks of the stem large, ovate, smooth, unequal at the base, variously and acutely sinuated and toothed, veiny and of a light dull green, flowers axillary, erect, white, sweet-scented, especially at night, about three inches long, fruit one-half inch in diameter, very prickly, seeds black. (*Lindley.*)

The narcotic properties of stramonium have been proved by Lindberger and others to correspond exactly with those of the belladonna and hyoscyamus; an alkaline principle

has been separated from the seeds by Runge and other chemists, which so closely agrees with atropia in all its properties that the general opinion regards them as identical.

Sp. 2. D. Tatula. A native of North America, very nearly the same as D. Stramonium, but is a larger plant with purple stems, and the corolla similarly stained at its edges.

D. fatuosa (Kala dhatoora) and *alba* (Sâda dhatoora) are very common over the peninsula, of India, and are also called *Jowz mazil*, or methel, (Royle) the seeds being frequently used as a poison.

For the purpose of facilitating theft, and other criminal designs, the seeds are very commonly given in Bengal with sweetmeats to stupify merely, but not with the intention of killing; intoxication or delirium is seldom produced, the individual sinks into profound lethargy resembling coma, with dilated pupils, but natural respiration. These symptoms have been known to continue even for two days, and still recovery take place; cold affusion and strong stimulant emetics constitute the most effectual treatment. The vision often continues obscured long after the general recovery takes place. This state is best remedied by blisters to the temples or nape of the neck, and by cold affusion.

If given while the stomach is empty a much smaller dose may induce all the preceding symptoms, and prove fatal. This is well known to the Indian poisoners, who suit the time of administration according to the purpose they mean to serve.

Medicinal uses. The alcoholic extract of the seeds of the stramonium is a perfect substitute for belladonna for many of the purposes described under that head.

We are indebted to the native practitioners of India for a method of using stramonium in spasmodic asthma, which is certainly found of great benefit in numerous cases—we allude to the practice of smoking the leaves or dried stems. A drachm of the dried leaf or stem smoked like tobacco will often stop a paroxysm of asthma almost immediately. The practice however must be resorted to with great caution, and if carried to excess may prove exceedingly dangerous.

It has been resorted to also in mania, epilepsy, and chorea, and with alleged benefit.

Gen. 6.—Hyoscyamus.

Gen. characters. Calyx tubular, inflated at the base, five toothed, permanent, corolla funnel-shaped, irregular, with a spreading, unequal limb, divided into five obtuse segments;

filaments nearly equal, stigma capitate, capsule opening transversely by a convex lid, two-celled, many seeded. (*Lindley.*)

Sp. H. niger. Henbane.

A native of Europe and Asia Minor, now extensively cultivated in Seharunpore, in the neighbourhood of Agra and Ajmere, and also in the Botanic Garden of Calcutta. The seeds are sold in all the Bazars under the name of "*Khorasanee ajwain.*"

The henbane is biennial, from six inches to two feet high, of fœtid smell, taper, scarcely branched, hairy, the hairs tipped with a minute black gland, leaves sessile, amplexicaul, oblong-acute, coarsely and unequally slashed, pale dull green, slightly downy, with long glandular hairs in the midst, flowers axillary, sub-solitary nearly sessile, imbosomed in the uppermost leaves, than which they are shorter, calyx funnel-shaped, villous, five-lobed, regular, wider than the corolla to whose tube it is equal in length, each lobe acute, ovate, with an open œstivation, corolla dull dirty yellow, strongly netted with purple veins, and deep purple at the surface, funnel-shaped, five-lobed, lobes rounded, stamens five, shorter than the corolla, ovary nearly round, shining, pale green, two-celled, with numerous ovules adhering to the dissepiment, style purple at the apex, stigma capitate, fruit an ovate, many-seeded pyxis. (*Lindley.*)

In physiological action this plant and its preparations seem intermediate between belladonna and opium, combining great soothing and anodyne power with the property of dilating the pupil. Over opium hyoscyamus possesses the advantage of relaxing rather than constipating the bowels, and being less apt to occasion headache; in excessive doses however delirium, coma, and convulsions (the latter but rarely) supervene, and not uncommonly terminate in death.

The chemical properties of the leaves and seeds have been carefully investigated, and an alkali has been obtained by a slight modification of Mein's process for daturia. This alkali has been termed *Hyosciamia*, but it differs little, if at all, from atropia.

An excellent dry inspissated juice of the leaf has been prepared by Mr. Superintending-Surgeon Ludlow at Agra and Ajmere, by exposing the juice in thin layers on a shallow earthen vessel to the intense heat of the sun in April and May; we have used this extract very frequently, and deem it far superior to any imported from Europe or prepared in this country by other processes. In three grain doses its soporific and anodyne effects are most decisive, and its use

rarely, if ever, followed by any headache or other unpleasant symptoms.

Gen. 7.—Nicotiana.

Gen. char. Calyx tubular, 5-cleft, corolla funnel-shaped or hypocrateriform, with a 5-cleft, plaited, spreading limb. Stamens declinate, stigma capitate, capsule 2 or many celled, 2-valved, opening by 4 points. (*Lindley.*)

Tobacco, though of such infinite commercial importance, is but of little interest to the medical practitioner; we shall therefore confine our notice to one or two species.

Sp. N. Tabacum. This remarkable plant we are informed by Mr. Royle, on the authority of the Persian works on Materia Medica, was introduced into India in A. H. 1014 (A. D. 1605) towards the end of the reign of Jelaladeen Akbar Padshaw; from India tobacco probably found its way to the Malayan Peninsula and China, though Royle quotes the authority of Pallas, Loureiro, and Rumphius, who think tobacco was used in China at a period anterior to the discovery of the new world.

The species of our article is a native of the warmer parts of America; the root is long and fibrous, stem 4 to 6 feet high, erect, round, hairy and viscid, branching at top, leaves sessile, very large, ovate or lanceolate, acuminate, viscid, pale green, bracts linear acute. Flowers panicled on the ends of the stem and branches, calyx swelling, hairy, glutinous, half as long as the corolla, ending in five acute segments, corolla funnel-shaped, swelling towards the top, border dull red, expanding, with 5 acute lobes, filaments enclosed, anthers oblong, ovary ovate, style long and slender, stigma cloven, capsule ovate, invested with the calyx, 2-celled, 2-valved, but opening crosswise at top, loculicidal. Seeds very numerous, small, somewhat reniform, attached to a fleshy receptacle. (*Lindley.*)

Tobacco leaves when properly dried have a greenish yellow colour, a strong pleasant smell, and acrid taste; taken into the stomach by persons not habituated to its effects violent vomiting, diarrhœa, and collapse are occasioned. The effects of smoking the leaf are too well known to require notice in our pages.

Posselt and Reimman have published a most elaborate analysis of tobacco. Together with extractive, gum, gluten, resin, albumen, lignin, starch, and several salts of malic and phosphoric acids, with lime, potash, &c. they describe the

presence of two peculiar substances, which they term *nicotina* and *nicotianin.*

Nicotina.

Nicotina is a vegetable alkali, of well marked properties, and is thus extracted. Boil 12 lbs. of dried tobacco leaves in water acidulated with sulphuric acid. Evaporate to dryness by a gentle heat, digest the residue in alcohol, sp. gr. 847, distil off the greater part, and mix the residue with hydrate of magnesia or slaked lime. Distil again, the product is water containing nicotina and ammonia in solution; agitate with ether which dissolves a portion of the nicotina; by repetitions of the distillation and agitation with ether a solution of nicotina in this liquid is obtained.

The etherial tincture is deprived of water by chloride of calcium; by a gentle heat the ether may be separated while the nicotina does not rise before 212°. Obtained in this way nicotina is of the consistence of honey, of acrid taste, and brown colour; to purify it, it is distilled from an oil bath at 284°.

For the preceding details we are indebted to Dr. Thomson's Organic Chemistry, p. 284. The original work in which the process is published we have not had the opportunity of referring to. In the *Journal de Pharmacie*, 1 vol. xxiv. MM. Boutron, Charlard, and Henry, give the following different and simpler process, one however which is less productive than that we have above described.

Mix 1 lb. avoirdupois of tobacco with 332 cubic inches of water and $6\frac{4}{10}$ ounces of caustic soda in a distilling apparatus. Distil into a receiver containing rather more than an ounce of sulphuric acid diluted with thrice its weight of water; distil over 150 cubic inches, evaporate the product to 1500 grains. Cool, filter, mix with excess of caustic soda, and distil in a small retort. A colourless volatile liquid is obtained, which if concentrated in vacuò deposits crystals of nicotina. These crystals are deliquescent, the solution of acrid caustic taste, the vapor of the smell of tobacco, it boils at 375. Reaction—alkaline, readily converted into resin by contact with oxygen or atmospheric air, inflammable, soluble in water, in ether, in several oils, and in acetic acid, sp. gr. 1043, atomic weight, 26.25.

Nicotina is a virulent poison, a single drop being sufficient to kill a full grown dog. Its salts are crystallizable, have the taste of tobacco, are soluble in water and alcohol, but apparently insoluble in ether.

The best tobacco yields about 1 per 100 of this principle.

Nicotianin is a concrete oily substance of the nature of the volatile oils, obtained by repeatedly distilling tobacco leaf with water.

The powerfully sedative and relaxing effects of tobacco have led to its employment chiefly in the form of enema in the treatment of strangulated hernia, ileus, spasmodic colic and cholera, and in obstinate constipation. During the deadly sickness which succeeds its administration all spasmodic action is indisputably suspended, and in hernia and ileus relief, or even a cure, may be effected. But it appears to us from a perusal of the cases in which the tobacco injection has been used in cholera, that the practice is most dangerous, and cannot be too strongly deprecated.

But a few years have passed since the injection of tobacco smoke into the rectum was recommended even by official authorities as a prominent part of the treatment of persons apparently drowned. We can scarcely conceive a more certain mode of destroying all chances of recovery than having recourse to tobacco under such circumstances.

Besides the *Nicotiana persica* we find several other species mentioned by botanical and pharmacological writers. The Nicotiana persica gives the esteemed tobacco of Turkey and Syria. The celebrated Shiraz tobacco is also the produce of this species.

Gen. 8.—Crescentia.

We have only to notice one species of this genus, the *C. Cujete*, or Calabash tree of the West Indian Islands and the Spanish Main. From the pulp and the fruit a syrup is prepared in the West Indies, much used as a pectoral medicine, and as a poultice for bruises and inflammations.

Gen. 9.—Cestrum.

Cestrum has been recently separated from the Solaneæ, and made a separate order. One remarkable species, the Cestrum venenatum occurs at the Cape, at Houtniqua land, and elsewhere. A decoction of the bark is used by the Hottentots to poison their missiles, and to destroy wild beasts.

M. Feé includes under the Solaneæ the Verbascum Thapsus, or Mullein, and its congenerous species. These we follow Lindley in treating of under the next order, with which they seem to be much more closely allied.

NAT. ORDER XCIV.—SCROPHULARINEÆ.

These are plants with herbaceous stems, rarely reaching the state of shrubs; their mode of inflorescence is very variable; some are very energetic narcotics, but the majority are devoid of any activity.

The most important botanical characters are the corolla being monopetalous, ovarium superior, seeds albuminous, stamens irregularly diandrous or didynamous. The fruit is capsular, with two to four valves, and numerous seeds.

They are found in abundance in all parts of the world. About 160 species are enumerated in the Indian Flora. (*Royle.*)

GEN. 1.—SCROPHULARIA.

Sp. Scrophularia nodosa.

An insignificant plant, still however officinal in the British Pharmacopœia. It derived its name from its reputed anti-scrophulous virtues, but it is now known to be quite useless.

GEN. 2.—DIGITALIS.

Gen. char. Sepals five, rounded or acute, permanent, much shorter than the corolla, the uppermost narrowest, corolla ventricose, contracted at the base, with an oblique limb, upper lip emarginate, lower three-lobed, with the middle lobe the largest, stamens didynamous, inserted into the base of the corolla, anthers acute, naked stigma, capsule ovate with a septicidal dehiscence. (*Lindley.*)

Sp. Digitalis purpurea. Purple foxglove.

A common plant by road sides and in waste places in Europe. Biennial, roots fibrous, stem straight, slender, with several very slight angles, three or four feet high, leaves alternate, ovate, or elliptic, oblong, crenate, downy, rugged and veiny, dull-green, tapering at the base into winged footstalks, radical ones largest. Raceme terminal, one-sided, erect, simple, of very numerous large hanging scentless crimson flowers, elegantly spotted and hairy within. The seeds are small, oblong, pale brown, and pitted.

The leaves, which are most extensively employed in medicine as a sedative and diuretic, are gathered while the plant is in flower, and dried by exposure to the sun, or suspension in a warm room. While fresh they are inodorous, when

dry the smell is faintly narcotic, taste bitter and nauseous, they evolve ammonia if treated with lime, and communicate their properties to water and alcohol. The analysis of the leaves presents very discordant results. It is certain that they contain astringent matter, chlorophylle, and mucus, resin, starch, gum, fibre, and volatile oil. Hare considers the resin to be the active principle, Le Royer however ascribes it to a principle he names *Digitaline*. The existence of this substance has not however been satisfactorily proved.

Digitalis produces two remarkable effects on the animal economy, proving directly *sedative*, and also *diuretic*.

As a *sedative* it diminishes the activity of the circulation, abates morbid heat, and allays pain, at the same time that the activity of the absorbent vessels is increased, and the discharge of urine thereby promoted.

The pulse has been reduced from 110 to 40 beats in a minute in one case, in another from 130 to 60 in six hours, in a third from 125 to 45 in forty-eight hours; any sudden exercise, change of posture, or mental excitement however again accelerates the pulse, renders it fluttering, induces nausea and fainting, and has in more than one instance ended in sudden death. Such alarming symptoms are best met by ether, ammonia, brandy, and similar stimulants.

The dose necessary to produce these effects varies remarkable in different individuals. A servant girl, aged 17, in the family of the Editor, was thrown into almost fatal collapse by 20 drops of the tincture, given during an attack of peritonitis. In many cases the remedy accumulates in the system before it displays its effects. These may occur at an interval even of some days after the medicine has been remitted; together with the symptoms above described convulsions often occur in such cases.

In very large doses, vomiting, purging, and deadly collapse are induced, and death takes place in a period of usually from 6 to 24 hours, under many of the symptoms of malignant cholera.

No marked appearances of importance are observed in the bodies of persons poisoned by this substance.

The diuretic effects of digitalis are chiefly evident while its sedative influence exists; at this time also the system seems more sensitive to the influence of other diuretic remedies, such as squill and mercurial preparations. Formulæ for such preparations will be found in the Pharmacopœia.

Digitalis is chiefly used in hypertrophy of the heart, acute inflammation, and rheumatism, and in inflammation of the

membranes of the brain, inflammatory dropsies, &c. The utmost caution is necessary in its administration, for the reasons above stated.

The powder, tincture, and infusion are the forms in which digitalis is most employed. The powder is given at first in half grain doses thrice daily, and carried on with great caution to two or three grains.

Gen. 3.—Herpestes.

Calyx 5-parted, upper sepal very large, ovate, 2 lowest sepals narrower, lateral, linear, and covered by the rest. Corolla tubular, somewhat 2-lipped, upper lip bifid, lower trifid, with flat equal segments. Stamens didynamous, enclosed, anthers approximated in pairs, with diverging segments, capsule 4-valved. (*Lindley.*)

Sp. 1. *H. Monnieria.*

Vern. Jala brimmi, *Sans.* Adha Birni, *Beng.*

A native of tropical countries, stems several, annual, creeping, round, jointed, branching, smooth, succulent, leaves opposite, sessile, obovate, wedge-shaped, or oblong, smooth, entire, obtuse, fleshy, dotted with minute spots. Peduncles axillary, alternate, solitary, round, smooth, one-flowered. Flowers blue, bractes 2-awled, pressing on the calyx laterally. Calyx 5-leaved, corolla campanulate, border 5-parted, anthers 2-cleft, blue, stigma large, capsule ovate, 2-celled, 2-valved. Seeds very numerous. (*Roxb.*)

The natives use the expressed juice mixed with petroleum as a local remedy in rheumatism.

Sp. 2. *H. amara.*

Syn. Caranga amara, *Vahl.* Gratiola amara. *Roxb. Fl. Ind.* i. 135.

The leaves are described as excessively bitter, the plant is a native of the Moluccas, and was accidentally introduced into the Botanical Garden of Calcutta.

In this family also occur *Gratiola*, a separate genus, under which writers describe the Gratiola officinalis, or hedge hyssop of Europe, a bitter cathartic and emetic, also diuretic, and a violent poison—and *Scoparia dulcis*, a Spanish American, mucilaginous, laxative, by some thought febrifuge.

Roxburgh describes 18 species of Gratiola in the Flora Indica, of which three are natives of Molucca, the rest of continental India. They have however all been referred to

other genera. Those mentioned above are the only species to which he assigns any remarkable properties.

Gen. 4.—Verbascum.

Verbascum nigrum and *V. Thapsus* or Mullein, are supposed to be narcotic, the seeds were used to poison fish. Feé gives a separate article to the Verbascums which they are too insignificant to deserve.

Gen. 5.—Calceolaria.

Lindley describes two species, C. trifida, and C. pinnata, natives of Peru, the former a tonic febrifuge, the latter emetic and purgative.

Gen. 6.—Linaria.

Calyx five-parted, corolla personate, stamens hairy at the base, capsule opening by pores or opercular valves or teeth.

Sp. 1. Linaria vulgaris. *Antirrhinum Linaria.* Toad flax, Europe.

Bitter, supposed to be purgative and diuretic, and employed in a lotion for some cutaneous diseases.

Sp. 2. *L. Cymbalaria,* Ivy-leaved snap-dragon.

Vern. Karamba, *Sans.*

Stems long, pendulous, filiform, very much tangled, smooth, hanging from old walls, leaves cordate, five-lobed, alternate, smooth. Flowers solitary on long axillary stalks, variegated with violet and blue, palate yellow, spur short and pointed, capsule roundish, irregularly torn at top, seeds black and wrinkled. Taste warm, and rather aromatic.

Given in India with sugar for the cure of diabetes. Lindley observes that Hamilton's remarks to this effect are probably applicable to the *Lin. ramosisimus* of Wallich, a nearly allied species.

Gen. 7.—Vandellia.

Lindley describes V. diffusa of the Isle of France, Brazil, and Yuagana, where it is considered of great value as an emetic and febrifuge, and in the treatment of dysentery.

Torenia asiatica, Linn. (Caela dola, *Sans.*) the juice of the leaves is considered in Malabar a remedy for gonorrhœa.

Gen. 8.—Picrorrhiza. (Royle.)

Calyx leafy, campanulate, almost equally five-cleft. Corolla campanulate, shorter than the calyx, nearly equally four-cleft, with the segments entire. Stamens four, inserted into the throat of the corolla, nearly equal, diverging, projecting some distance; anthers two-celled with cells confluent at the apex, valves of the capsule septiferous, in the middle bipartite, with a double dissepiment, seeds enclosed in a bladdery arillus-like membrane. (*Bentham.*)

P. Kurrooa. (*Syn.* Veronica? Lindleyana, Wal. Cat.)
Gosainthan, Kemaon, Kedarkanta. A fleshy rooted perrennial, stems very short, ascending, leaves obovate, tapering to the base, serrated, smooth or nearly so, scape erect, naked. Flowers sessile, deep blue, in dense spikes.
The root is intensely bitter, and used as a medicine in India.

Gen. 9.—Euphrasia.

Lindley cites the *E. officinalis* (eye-bright) a pretty plant found in Europe, the Himalayas, and Cashmere. Slightly bitter and aromatic, once celebrated as an application to weak eyes, but now seldom or never employed.

Gen. 10.—Veronica.

Sp. 1. *V. Beccabunga.* Speedwell.
A favourite popular remedy in Europe in coughs, chronic visceral affections, and dyspepsia. It contains a little tannic acid and mucilage, but no more remarkable ingredient. It is no longer employed in regular medical practice.

Sp. 2. V. officinalis. A similar plant, officinal in the French Codex.
There are several Indian species.

NAT. ORDER XCV.—CYRTANDRACEÆ.

The plants of this order are watery, and possess little sensible properties. *Didymocarpus aromaticus* is stated by Dr. Wallich to be used as a perfume and aromatic drug, called by the natives *Kumkuma* and *Ranigovindhi (Royle,* p. 294.)

NAT. ORDER XCVI.—PEDALINEÆ.

An order of some importance, identical with the Sesameæ of Brown. The genus Sesamum furnishes a valuable oil. Lindley merely makes the following note of the order:—

Sesamum indicum, *Linn.* } have mucilaginous seeds like lin-
Pedalium murex, *Linn.* } seed,

and yield a mucilaginous meal used in India for poultices.

Gen. 1.—Sesamum.

Sesamum orientale, Schitchi, *Rheede.* Σησαμον, Hippocrates.

Vern. Black seeds, *Kala til*, white seeds, *Suffed til.*

Oil, *meetha til, til ke tel*, gingilie oil, &c.

The sesamum plant is universally cultivated in the East for the oil expressed from the seeds.

The stalks are straight, herbaceous, nearly cylindrical, hairy, about 2 feet high, leaves oval oblong, with long petioles, entire, toothed, the upper leaves alternate, flowers solitary, axillary, with short peduncles and linear bractes, capsules oblong, rather compressed, marked with rather deep furrows. Seeds slightly oval, small, yellow or black, tasteless and inodorous.

A very sweet oil (siritch, *Arab.*) is obtained by expression from the seeds; this oil is much used as an article of diet, for frictions, and lighting. The oil-cake mixed with honey and preserved citron is esteemed an oriental luxury. The leaves of the plant are used as poultices.

Nine pounds of the seed yield two quarts of perfectly sweet oil, which will keep many years without becoming rancid; the oil made in Persia, and thence largely exported, is called *Kurit schuk.*

Sesamum oil is of the sp. gr. 911, insoluble in alcohol, readily saponifies with the alkalies, and combines with the oxide of lead. For all purposes of medicine and pharmacy it is when well prepared quite equal to the best olive oil.

Gen. 2.—Pedalium.

Gen. characters. Calyx 5-parted, corolla sub-equal, with 5-cleft border, nut corky, 4-cornered, thorny on the angles, 2-celled, seeds 2-fold.

Sp. P. Murex.
Vern. Gokeroo, *Hind.*

A pretty large plant, succulent, ramous, annual, growing generally over the country, but chiefly on the Coromandel coast, in a moist sandy soil; flowers in the rainy and cold seasons. Root annual, ramous, of deep orange colour, stem scarcely any, branches nearly opposite, spreading, with their extremity erect, round, and smooth, from 6 to 24 inches long, leaves opposite, petioled, oval, irregularly toothed, truncate, three-nerved, pretty smooth, two to three inches long, by one and a half or two inches broad, petioles channelled, about two inches long. Flowers axillary, short, peduncled, single, pretty large, yellow, erect, on each side of their insertion is a small round brown gland.

The fresh plant renders water or milk very mucilaginous without altering the taste, colour, or smell of the liquid. This thickening disappears in a few hours. A watery infusion of this kind sweetened with sugar is a favourite and excellent native demulcent in acute gonorrhœa. Butter milk is often fraudulently thickened by the use of this leaf. *Roxb. Fl. Ind.* iii. p. 114.

NAT. ORDER XCVII.—BIGNONIACEÆ.

The leaves of Bignonia Chica yield red colouring matter. The bark and capsules of B. indica are astringent, and used in tanning and dyeing. The pleasant tasted and fragrant flowers of B. chelonoides (suaveolens?) are described as being used as a cooling drink in fevers. Lindley quotes two species, B. catalpa and B. antisyphilitica, the former a native of the southern parts of the United States; leaves and bark extremely bitter, a decoction of the pods used in asthma, and the leaves employed for fomentations.

Sp. Bignonia antisyphilitica. The bark of the younger branches of this tree is considered in Brazil one of the most powerful remedies against malignant syphilitic swellings. The bark is used both internally and externally in decoction and powder.

NAT. ORDER XCVIII.—ACANTHACEÆ.

This order resembles the last in structure and distribution. Its species are extremely numerous, are found in India every where on the plains, and also at considerable elevations. Numerous as is the order, it still contains but few plants of

much medicinal value; some are demulcent, a few others bitter and acrid.

Gen. 1.—Rhinacanthus.

Calyx regularly 5-parted, with small subulate bracts and bractlets, corolla hypocrateriform, 2-lipped, with a long slender tube, the upper lip narrow, the lower trifid with equal segments, stamens two, inserted in the throat of the corolla, anthers 2-celled, capsule clavate at the base, much compressed and seedless, in upper part 4-seeded, or by abortion 2-seeded. Dissepiment complete, adnate. Seeds ovate, biconvex with hooks, which are concave and obtuse. (*Lindley.*)

Sp. R. communis.

Syn. Justicia nasuta, Linn. *Roxb. Flora Indica*, i. p. 120. *Rheede*, ix. t. 69.

Vern. Pulcolli, *Rheede.* Kabooter ke jur, *Hind.* Jooi panee, *Beng.* Naga mulli, *Tel.* and *Tam.*

A native of the continent of India.

Leaves opposite, stalked, broad, lanceolate, obtuse, above smooth, below a little downy, entire, from 2 to 4 inches long, and from 1 to 2 broad, panicles corymbose, axillary, and terminal, always 3-cleft, bracts minute, flowers small and white, corolla with a long slender compressed tube, under lip broad, 3-cleft, upper lip erect, linear, sides reflected, apex bifid, anthers projecting beyond the tube, twin. *Roxb.*

Milk boiled on the roots is deemed aphrodisiac; with lime-juice and pepper it is used for the cure of ringworm, also for the bites of venomous snakes, hence the Telinga and Tamul name Naga mulli, or jasmine of the cobra capella. "Nagā," as Roxburgh informs us, is prefixed to most of the native antidotes, and occurs very often in their writings. Roxburgh's further observations we esteem it our duty to quote most prominently, agreeing as we fully do with their import:—"like the ancient physicians of Greece and Rome those of India at this day make poisons and their antidotes a very chief part of their studies, but from the seeming inactivity of a very large share of them, we may safely conclude that their practice is equally frivolous with that of the ancients, and ought to be discouraged as much as possible, because at least they prevent the application of more efficacious remedies."

Gen. 2.—Justicia.

Sp. Justicia Ecbolium, Roxb. Fl. Ind. i. 114.

Vern. Jati, *Hind.* A native of the Indian forests, said to be diuretic.

Flowers pale blue, tube very long and slender.

Lindley also quotes *J. pectoralis*, a stomachic, *J. biflora*, and *Acanthus mollis*, having emollient leaves used for poultices.

Gen. 3.—Andrographis.

Calyx deeply five-parted with narrow segments, corolla bilabiate, the upper lip entire or bifid, when resupinate appearing to be divided in the contrary way. Stamens two, anthers two-celled, cells parallel, bearded at the base, four or many seeded, dissepiment adnate, seeds oval, obtuse, tapering obliquely, truncate at the base, pitted with a deep hilum, hooks stalked, dilated, scaly, deciduous. (*Lindley.*)

Sp. A. paniculata.

Syn. Justicia panic. *Roxb. Fl. Ind.* i. p. 118.

Vern. Kalamegh, *Beng.* Kalupnath, or Muha tita, (great bitter), *Hind.* Kreat of *Malabar.*

A native of dry ground under the shade of trees; flowers in the wet and cold seasons.

Stem erect, generally annual, at least down to the root, branchy, slender, four-sided, pointed, smooth, one to two feet high, branches opposite, cross armed, four-sided, spreading, leaves opposite, short, petiolate, lanceolate, entire, smooth two to three inches long. Racemes terminal, and from the exterior axils horizontal, long, secund, four-sided. Flowers remote, rose-coloured, long pedicelled, alternate, erect, downy. Bracts, a large exterior opposite pair, within the flower-bearing one; there are two smaller embracing the base of the pedicels, corolla bilabiate, tube recurved, lips linear and reflected, the superior broadest, three-toothed, the inferior two-toothed, filaments as long as the lips of the corolla, projecting, hairy. Anthers very flat, obovate, firmly united at the base and there bearded, capsule erect, subcylindric, seeds three or four in each cell, cylindrical. *Roxb.*

Celebrated as a stomachic bitter, and used in cholera and dysentery. It is the basis of the celebrated "*Drogue amere;*" this is a compound of mastic, frankincense, resin, myrrh, aloes, and creat root, steeped in brandy for a month, and the tincture strained and bottled.

GEN. 4.—GENDARUSSA.

Calyx regular, 5-parted, furnished at the base with small bracts, corolla bilabiate, upper top arched, tube short. Stamens 2, inserted below the throat of the corolla, connective rhomboidal, lanceolate, oblique cells of the anthers placed obliquely one above the other, valves half ovate, the lower calcarate, capsule sterile below, and little narrowed, four-seeded at upper end. (*Lindley.*)

Sp. G. vulgaris.

Syn. Justicia Gendarussa, Linn. *Roxb. Fl. Ind.* i. p. 128.

Vern. Caroo noochie, *Tam.* Kali shumbli, *Duk.* Jugut mudun, *Beng.* Nela nirganda, *Sans.*

Common in gardens in India, and supposed by Roxburgh to be a native of the Malay islands. Flowers during the wet season. It is a shrub with dark purple or green smooth shoots, leaves short stalked, lanceolate, obtuse, smooth, with the rib and veins dark purple. Spikes terminal, somewhat whorled, leafy at base, flowers reddish purple. Leaves and stalks when rubbed have a strong, rather aromatic odour. After being roasted they are given in chronic rheumatism by the native practitioners. The plant is also said to be emetic.

Adhatoda Vasica, (Nees.) Uroos or Utarusha, *Sans.* Justicia Adhatoda, *Linn.* All parts of the plant are bitterish and slightly aromatic, and supposed to be antispasmodic; the wood is soft, and much esteemed for making charcoal for gunpowder.

Thirty-two species of Justicia are described by Dr. Roxburgh. Those only which we have quoted have any medicinal virtues attributed to them, and all but one are now referred to other genera.

NAT. ORDER XCIX.—VERBENACEÆ.

This order contains forest trees, herbs, and shrubs of elegant aspect, with opposite or verticillated leaves. It is nearly connected with the following family. Many of the species are somewhat bitter or astringent, some aromatic or fœtid; an acrid pungent principle resembling pepper is secreted by the fruits of several of the vitex genus. The order is distinguished for including the magnificent teak tree, (*Tectona grandis,*) now widely cultivated over India.

Gen. 1.—Verbena.

Sp. 1. *Verbena officinalis.* Vervein, ιερα βοτανη, *Dioscorides.*

A native of the warm parts of Europe, this plant is described as astringent, febrifuge, &c. but has fallen into just neglect. Still among the ancient Greeks and Gauls it held the highest place in popular estimation; it was used to purify the altars, and formed the crowns of heralds and ambassadors. The Druids gathered it with the same marks of veneration as the misseltoe. Employed extensively as a medicine it was also the base of numerous philters, or love portions, and hence derived its name of *Veneris vena*, or source of love.

Sp. 2. *V. jamaicensis*, Linn.

Syn. Stachytarpha Jam. *Lindley.* The expressed juice of the leaves in doses of one to two table spoonsful is used in the French West India Islands as a cooling purgative for children, and in clysters.

Gen. 2.—Vitex.

Gen. char. Calyx campanulate, five-toothed, corolla bilabiate, the upper lip bifid, lower trifid, middle segment largest. Stamens somewhat protruding, anthers oval, erect, style filiform, stigma bifid, drupe globose, four-celled, four-seeded. (*Lindley.*)

Sp. 1. *Vitex trifolia.* Roxb. Fl. Ind. iii. p. 69.

Vern. Neer nochie, *Tam.* Panee ke shumbalie, *Duk.* Ussel ke abee, *Arab.* Nisindha, *Hind.* also Seduaree. Neela vavilie, *Tel.* Caranosi, *Rheede.* Jala nergundi and Sinduvara, *Sans.*

Young shoots round and villous, leaves opposite, ternate, leaflets all sessile, ovate, oblong, entire, hoary underneath, the pair from one to two inches long, the terminal one much longer, petioles about an inch long and hoary. Panicles terminal, linear oblong, composed of brachiate and dichotomous ramifications, every part hoary. Flowers small, of lively light blue colour, bracts minute, calyx campanulate, hoary, mouth slightly five-toothed, stamens as long as the corolla, ovary round, two-celled, style as long as the corolla, stigma of two filiform spreading lobes, drupe round, smooth, when ripe black, size of a small pea, stone of the same shape as the drupe, four-celled. Seed solitary, albumen when seeds are ripe none. (*Roxb.*)

Leaves slightly bitter, but of delightfully aromatic taste and smell; are deemed powerful external applications in rheumatism, sprains, &c. The powdered leaves are said to cure intermittent fevers. The fruit in powder is given usually in electuary, or decoction, for amenorrhœa and several other diseases. It is a common Indian plant. Sir William Jones in the 4th. vol. Asiatic Researches, p. 293, states that the leaves are used to stuff pillows, to cure catarrh and head-ache. The flowers, according to Dr. Hamilton, are prescribed in Behar with honey in fevers attended with vomiting and much thirst. (*Ainslie*, ii. p. 238.)

Sp. 2. Vitex Agnus castus—seeds globular, obtuse, mucronate, smooth, brownish grey, four-celled, half enclosed in the persistent and downy calyx. The leaves are digitate, having five or seven segments.

The seeds are inodorous when entire but when bruised their odour is acrid and disagreeable. The taste acrid and pepperish, very persistent. They are very rich in essential oil, and possess powerful stimulating properties. At Smyrna the powder strewed over a sliced onion and applied to the stomach is deemed a certain remedy in colic. (*Lindley.*)

Sp. 3. Vitex Negundo.

Vern. Noochie, *Tam.* Nergundi, *Beng.* Shumbali, *Duk.* Fenjengisht, *Arab.* Nisinda, *Hind.* Wayalakoo, *Tel.* Sinduya and Sindhooka, *Sans.*

Trunk irregular, often as thick as a man's thigh, branches three, opposite, young shoots downy, slightly 4-sided, leaves opposite, petioled, ternate and quinate. Flowers small, numerous, a beautiful bluish purple, corolla with the lower lip large, entire, upper lip shorter, four parted.

In India a decoction of the aromatic leaves is used as the warm bath for women after delivery. (*Roxb.*)

In medicinal qualities it is similar to, but weaker than the preceding species. The decoction of the root is a pleasant bitter, and is given in cases of intermittent fever. The warm leaves are stated by Mr. Sherwood to be a useful application in rheumatism or sprains. The Mahomedans are in the habit of smoking the dried leaves in cases of head-ache and catarrh. Fruit considered vermifuge in Behar.

To the fruits of all the preceding species the native name *Filfil burree*, or wild pepper, is applied.

Gen. 3.—Gmelina.

Sp. Gmelina asiatica.

Vern. Bidari, *Sans.* Goomodoo, *Tel.*

A very common bush on the Coromandel Coast. The root is mucilaginous and demulcent.

G. parviflora. Sheeri goomoodoo—a tree much resembling the last. Its leaves slightly bruised under water renders it mucilaginous, which property the water retains till the mucilage is decomposed by fermentation.

Roxburgh has five species of Gmelina—the G. arborea, (Gumar, or goombur of Bengal, Joogam, Chookur, *Hind.*) is a very large timber tree, the wood of which much resembles teak, and is very little affected by worms or the ordinary causes of decay. (*Fl. Ind.* vol. iii. p. 85.)

Besides the preceding we may notice,

Callicarpa lanata; (Roxb.) bitterish, and rather aromatic. *Congea villosa* has leaves of heavy smell, and is used by the natives in medicine.

Premna integrifolia (Agnimantha, *Sans.*) root warm and bitterish, given in decoction as a cordial and stomachic, decoction of the leaves used in colic and flatulence. (*Rheede.*)

Gen. 4.—Volkameria.

Sp. Volkameria inermis.

Vern. Shangam coopy, *Tam.* Sangkoopee, *Hind.* Nalla Opie, *Tel.* Kundali, *Sans.* Bunjoma, *Beng.*

The juice of the root and leaves is bitter, and given as an alterative in venereal, and scrofula. Dose a table spoonful. The plant is common in the jungles, and is very beautiful.

Nine species are described by Roxburgh, but he gives no account of their supposed medicinal virtues.

NAT. ORDER C,—LABIATÆ.

A very extensive order, containing chiefly herbs, rarely shrubs. The stalks are branching, with opposite and quadrangular branches, the leaves opposite, sometimes verticillate, in sets of three. Flowers naked and opposite, have bracteæ, and are disposed in spikes, corymbs, or panicles.

The flowers are irregular, ovary 4-lobed, and style arising from the base of the ovules.

The characters of this family are so uniform that Jussieu said they might be considered as one large genus; this extends to their chemical as well as botanical peculiarities; all are odoriferous, a few fœtid; their odour depends on an essential oil containing camphor, or its basis camphene. This oil is yellow, of pungent taste and smell, and is lighter than water. It adheres so strongly to the plants, that most of these will retain their peculiar smell for years after being sun or stove dried.

Besides this oil several of these plants contain a bitter principle. This is strongly developed in the Germanders, which have consequently been regarded as febrifuge.

All the Labiatæ are innocent, none however alimentary, with the exception perhaps, M. Feé observes, of the Ocymum tuberosum of India, a species regarding which he suggests additional investigations.

In medicine this family supplies us with tonics, febrifuges, stimulants, and anthelmintics; their chief use is in cookery and by the perfumer, as they yield several highly esteemed essential oils. Their geographical distribution is most extensive, extreme cold seeming to be the only limit to their diffusion.

Lindley in his *Flora Medica*, p. 485, introduces this order by stating, that "a great number of different plants have from time to time been introduced into medicine as aromatics or stimulants, or for imaginary virtues. It would be only encumbering the pages of this work to notice any thing like all such cases in detail, as the greater part are abandoned in modern practice, and appear to be of little or no consequence except in the kitchen." These remarks are especially applicable to the Indian plants of this order.

Gen. 1.—Salvia.

Sp. 1. *Salvia officinalis.* Sage.

Vern. Salbia, *Hind.*

A slightly aromatic, shrubby, but dwarfish plant, of somewhat bitter and very hot, aromatic, and slightly astringent flavour. These qualities are retained on drying. It affords on distillation with water a large quantity of essential oil, containing 26 per cent. of camphor. The oil is used by the perfumers, and the plant is a very favourite seasoner in Europe; it is but little employed in medicine.

Sp. 2. *Salvia bengalensis,* Roxb. Fl. Ind. i. p. 146. (Murtoo) *Meriandra bengalensis* (Bentham). Common in Bengal

and Coromandel, much stronger than the officinal sage,—a straggling shrub with a trunk often as thick as a man's arm.

There are very numerous species of this genus, which correspond very closely in their properties; one, the *S. amarissima*, is excessively bitter.

Gen. 2.—Rosmarinus.

Sp. R. officinalis. Rosemary, Europe, Asia Minor.

Vern. Ukleel ul jilbal. Hasalban achsir, *Arab.*

In many properties similar to the last, odour and flavour differ. The essential ingredient in the well known *Eau de la reine d' Hongrie* is the essential oil of this plant.

A shrub three to four feet high, densely leafy. The oil is stated most positively to possess the power of encouraging the growth of hair and of curing baldness. It is the colouring ingredient of green pomatums.

Gen. 3.—Teucrium.

Sp. T. Chamædrys. Common germander, European thickets.

Taste more bitter than the preceding articles; an ingredient in the celebrated Theriaca andromachi, or *treak farook.*

Gen. 4.—Hyssopus.

Sp. H. officinalis. Hyssop.

Vern. Zoofáè gabis, *Arab.*

This owes its celebrity to a passage in Josephus, who used the hyssop as a term of comparison with the cedar to give an idea of Solomon's botanical knowledge, (*Feé* p. 455). In the Old Testament we meet its name in several of the sacred texts: "Purge me with hyssop, and I shall be clean;" and again—"The hyssop which groweth on the wall."

The dried plant is brought to India from Syria. The Arabians place it among their anthelmintics and stimulants. Pliny thought it useful in diseases of the chest. It is cultivated in the Calcutta Garden. Celsus regarded it as diuretic.

Gen. 5.—Lavandula. (*Lavenders.*)

Sp. L. vera and *Spica* of Decandolle.

Syn. L. Spica of Linn., and its variety. Europe.

Flowers small, bluish, calyx tubular, cylindrical, streaked, tomentose, corolla infundibuliform, pubescent, tube rather

longer than the calyx, limb with five unequal divisions, upper lip large, obcordate, bifid, lower lip trifid.

Odour agreeable and penetrating, taste aromatic, acrid, rather hot.

The volatile oil is limpid, very transparent, yellowish white; four parts contain nearly two of camphor. Often adulterated with the oil of turpentine, and of a species of lavender of superior aromatic power, though more acrid.

The variety *b.* (spica) yields an oil much used by porcelain painters, and called "oil of spike."

L. Stœchas, (æstakhoodus,) is different in some botanical characters, in other respects nearly the same as the last. It is much prized as an expectorant and antispasmodic by the Arabs.

Gen. 6.—Mentha.

Sp. M. piperita. Peppermint. Europe.

The odour is strong and camphor-like, taste aromatic, hot, and camphoraceous, producing a sensation of cold on the tongue; the aroma of this plant is almost destroyed by drying.

The essential oil is greenish yellow, and very liquid; after long keeping it deposits crystals of camphor; it is often adulterated, especially with the oils of congenerous species, a fraud almost impossible to detect.

The essential oil is a very valuable stimulant, and is especially useful in flatulent diseases, and in the early stage of the malignant cholera. It is a deservedly great favourite in the nursery.

Dissolved in spirit it constitutes the tincture or essence, distilled with water it affords the Aqua menthæ piperitæ of the shops.

M. sativa. Widdelilam, *Tam.* Poodina, *Duk.* Nana, *Arab.* Hibbuk, *Arab.*

Prescribed by the Mahomedans in dyspeptic complaints, and to stop vomiting.

M. viridis. Spearmint.

Vern. Pahari Podeena. This species is a native of Cashmere, and cultivated in the plains for its essential oil and distilled water (see Pharmacopœia.)

M. Royleana is much used by the hill people of the Himalayas.

All the mints possess analogous properties. M. Feé mentions briefly,—

—*M. arvensis.* Field mint.

—*M. hirsuta.* Hairy mint, or water mint, acrid, bitter, and aromatic, reputed to be diuretic; an ingredient in the celebrated " thieves vinegar," the " baume tranquille," &c.

—*M. Pulegium,* Pennyroyal; the distilled water much used as a vehicle for medicines for children, and in flatulent colics—a popular emmenagogue.

—*M. rotundifolia,* or round leaved. Bitter, acrid, and astringent, acts as a rubefacient when applied to the skin; said to be anthelmintic.

—*M. rubra,* (red) abounds in essential oil; one of the best substitutes for peppermint.

—*M. sylvestris,* (wild) less powerful than the preceding kinds.

GEN. 7.—GLECHOMA.

Sp. G. hederacea, (ground ivy.) Europe.

Aromatic and rather bitter, has had a great reputation in the treatment of pulmonary diseases.

GEN. 8.—LAMIUM.

L. album, or white nettle, supposed to be astringent, but altogether inert.

GEN. 9.—BETONICA.

Sp. Betonica officinalis.

Dried leaves in powder cause sneezing, the roots were once deemed emetic, but this supposition is disproved by recent experiments.

GEN. 10.—MARRUBIUM.

Sp. M. vulgare. Horehound. Europe. Odour very agreeable but strong, taste bitter and durable; an ingredient in the *Theriac,* and a very celebrated popular remedy in the treatment of colds, consumption, and such diseases. It is said also to be febrifuge and emmenagogue. (See art. *Pucha Pat.* p. 493.)

GEN. 11.—ORIGANUM. Marjoram.

Sp. O. vulgare. O. Dictamnus. Dittany.

Analogous in their properties to mint.

Buklukt ul gezal, *Arab.*—still much esteemed by the Arabs and Persians as a tonic and stimulant; Celsus deemed

it an emmenagogue. The leaves are given in doses of from half a drachm to one drachm.

O. creticum, or Dictamnus creticus, the oil of which is of blood red colour. The virtues of the latter plant have been celebrated by Pliny, Theophrastus, and Dioscorides; it grows on Mount Ida, and is the plant alluded to by Virgil in the 12th book of the Æneid, l. 412. *Feé.*

O. Majorana, Marroo, *Tam.* Murwa, *Duk.* Αμαραχον *Greek.* Cultivated in some parts of lower India, is supposed to be the σαμφυχον of the ancients.

Gen. 12.—Thymus.

Sp. T. vulgaris.

A pretty, though very dwarfish shrub, of agreeable strong and penetrating odour, yielding a volatile oil, and much used for seasoning food by Europeans. Another species, the *T. Serpyllum* is similarly employed

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Additional articles noted by M. Fee.

Ajuga reptans, Bugle, ...	Slightly astringent and bitter.
Leonurus cardiacus, ...	Tonic.
Satureia hortensis, ...	Stimulant.
——— capitata, ...	Stomachic and emmenagogue.
——— Thymbra, ...	Ditto, ditto.
Nepeta cataria, ...	Antithysteric, a powerful aphrodisiac to cats.
Ocymum basilicum, ...	Very rich in essential oil, see *Ocymum.*
Prunella vulgaris, ...	Little used, weakly aromatic.
Plectranthus suaveolens, ...	Patchouley of Virey, a dried plant from Bourbon, the odour resembles valerian. It is placed among clothes to keep away insects.

Dr. Royle very appropriately sums up his account of this family by stating that many which are indigenous in the Himalayas, and the native names of some of which we have quoted, continue to be imported from the Red Sea "to be prescribed at the foot of mountains, where the fresh and genuine articles may be had in any quantity." Dr Royle especially recommends the introduction of the peppermint, with the essential oil of which the natives are well acquainted from its common use in cholera. He informs us that species of Anisomeles, Dyospita, Elscholtzia, and Pogostemon are however used as substitutes for their European allies. The *Ocymum sanctum* is sacred among the Hindoos—*Plectranthus cordifolius* and *Coleus barbatus* very aromatic. The *Meriandra strobilifera* (*murtoo*) from its strong fragrance is con-

sidered by Royle to be very promising, the *M. bengalensis* being already in use, and called Kafoor-ke-putta. *Roylea elegans* (Putkuroo) is deemed a febrifuge by the hill people, like some species of Teucrium in Europe.

The only plant of this family much cultivated in India is the Dracocephalum Royleanum, or Balungoo, the seeds of which, *Tukm balungoo*, are very generally used in India for the preparation of mucilaginous drinks. *Royle. p.* 303.

In Lindley's Flora Medica besides the species we have already noticed we find the following—

Gen. 13.—Anisomeles.

Sp. Anisomeles malabarica. (Malabar cat mint.)

Ajuga fruticosa, *Roxb. Fl. Ind.* iii. p. 1. East Indies and Isle of France. Nepeta malabarica, *Ainslie*, vol. ii. p. 294.

Vern. Pemayrutie, *Tam.* Moga beerakoo, *Tel.* Bootan kooshum, *Sans.*

The stem is erect, 2 to 5 feet high, 4-sided, with obtuse angles, branches numerous, axillary, ascending. Leaves petiolate, ovate lanceolate, obtuse, crenate, except at the base, which is entire, strongly reticulated with prominent veins, below wrinkled, above downy, flowers in axillary clusters, forming whorls, bractes filiform, pubescent, 1 or 2 to each flower, calyx 5-cleft, 10-angled, corolla, 2-lipped, upper lip entire, under one large, 3-cleft, lateral divisions reflexed, middle one orbicular, the root hairy, spotted with purple, anthers deep purple, stigma 2-cleft with divaricated lobes. *Wight.*

Ague patients are made to inhale the vapour arising from an infusion of this plant; this causes copious sweating. The leaves are bitter, astringent, and somewhat aromatic; they are given in infusion in the latter stages of dysentery and in intermitting fevers to the quantity of an ounce and a half twice daily *(Ainslie.)* The juice expressed from the slightly warmed leaves is prescribed for children in fever, from dentition. The entire plant is deemed emmenagogue in the West Indies.

Gen. 14.—Ocymum.

Sp. 1. *O. Basilicum.* Sweet bazil.

Vern. Tirnoot patchie verie, *Tam.* Subze ke beenge, *Duk.* Vepoodipatsa vittiloo, *Tel.* Deban shab, *Pers.* Kalee tulsee, *Hind.* Manjirika, *Sans.*

The small seeds deemed cooling and mucilaginous, and consequently given in gonorrhœa, ardor urinæ, and affections of the kidneys.

Sp. 2. *O. pilosum*, common in Upper India. *Arabic*, Habak; *Persian*, Rihan and Nazboo. Seeds aromatic, used by women to relieve after-pains.

Sp. 3. *O. sanctum.* Toolsi kejur, *Duk.* Toolasee vayr, *Tam.*
The root is given in decoction in fevers, half a tea-cupful twice daily. In Hindostanee and Bengalee the plant is called Kalatoolsee, in Sanscrit *Arjaka* and *Parnasa*, (Nalla tirtava, *Rheede.*) The Brahmins regard it as sacred to Vishnu, and use it in their funeral ceremonies. The Malays also strew it over the graves of their dead.

Sp. 4. *O. hirsutum.* Koolimitan, *Tam.*
Whole plant slightly aromatic, prescribed by the Hindoos in decoction in the bowel complaints of teething children.

Sp. 5. *O. album.* (White basil.)
Suffaid toolsee, *Duk.* Badrooge abeeg, *Arab.* Kookatolasie, *Tel.* Viswa tulasi, *Sans.*
A shrub about a foot high, leaves have a most pleasant aromatic taste and smell. The juice is given to children in colds to the extent of a tea-spoonful twice daily. The dried leaves are used as a substitute for tea.

Pucha Pat.

This is a well known article in Bengal. Its source is still doubtful. We extract the following notice regarding it by Dr. Wallich, from the Transactions of the Medical and Physical Society of Calcutta for 1835. Dr. Wallich has also kindly favoured us with an additional note on the subject.

"I shall now advert to another vegetable substance which, although most extensively used by the natives of this country, has hitherto continued one of the problems in our Indian Materia Medica. The drug to which I allude, is called in Bengallee as well as in Hindee, *Puchá Pát*, and is found in every bazar, almost throughout Hindustán. My esteemed friend Baboo Radhakant Deb informs me, that "there exists no Sanscrita name for this leaf, which is largely imported by Mogul merchants; that it is used as an ingredient in tobacco for smoking, and for scenting the hair of women, and that the essential oil is in common use for imparting the peculiar fragrance of the leaf to clothes among the superior classes of natives." I believe that the people of the peninsula are peculiarly fond of this perfume, as are also the Roman Catholic inhabitants of this country generally.

"Having ascertained, on my return from Europe two years ago, that

a large quantity of what appeared to be the same drug as that commonly sold in the bazars under the name of Puchá Pát had been imported from Penang, I requested Mr. George Porter, late of that Island, and formerly in charge of the Botanical establishment there, to favour me with an account of the article, and also, if possible, with some growing plants of it. In February last year (1834), I had the pleasure to receive from him several plants, which I have succeeded in multiplying by cuttings, and which appear to thrive remarkably well in this Garden. Mr. Porter has furnished me with the following memorandum: 'The Puchá Pát grows perfectly wild at Penang, and on the opposite shore of the Malay Peninsula, in Wellesley province. The Arabs use and export it more than any other nation. Their annual pilgrim ship takes up an immense quantity of the leaf. They use it principally for stuffing matrasses and pillows, and assert, that it is very efficacious in preventing contagion and prolonging life. It requires no sort of preparation, being simply gathered and dried in the sun; too much drying, however, is hurtful, in as much as it renders the leaf liable to crumble to dust in packing and stowing on board. In Penang it sells at the rate of a dollar and a quarter, to a dollar and a half, per pekul. In Bengal, some which was sent from thence several years ago, sold at 11 rupees 8 annas per maund. At times the price is much higher. The last investment sold so low as six rupees only per maund. It has not been seen in flower.' So far Mr. Porter's memorandum.

"The Puchá Pát plant is evidently of the family of Labiatæ. It forms a shrub (in the Botanical Garden) of two to three feet in height. The obtusely four-cornered branches and the leaves are juicy, and somewhat fleshy, and covered, especially the inferior surface of the latter, with a great deal of soft, pallid pubescence, which gives the plant a greyish appearance. All the young parts are densely villous. The leaves are opposite, petioled, ovate, obtuse, grossly and obtusely lobato-crenate, measuring from two to four inches; the lowermost on the branches are subcordate, all the others are cuneate, and entire at the base; the upper surface slightly rugose; under surface pallid, with very thick rib and nerves, and largely reticulated veins.

"None of the individuals in this Garden have hitherto shown any disposition to blossom; owing perhaps to the plant being so easily multiplied by division. All the green parts, on being rubbed, emit the peculiar smell of the drug sold under the name of Pucha Pát, which is also very like our shrub in the form, margins, and surface of the leaves.

"I should have mentioned above, that the Baron Hügel informs me that he has found a plant growing wild at Canton, which closely resembles that from Penang cultivated in this Garden.

"Whether *Marrubium odoratissimum Betonicæ folio.* J. Burm. Thesaur. Zeylan, p. 153, tab. 71, fig. 1, *(Marrubium Indicum,* N. L. Burman, Flor. Ind. p. 127,) be our plant or not, it is difficult to say; but it strikes me that there is at least a considerable affinity between them.

H. C. Botanic Garden, 6th June, 1835.

The plant has not to this time (April 1841) shewn any disposition to produce blossoms in the Calcutta Garden. Dr. Wallich has been informed by Major Jenkins, the Commissioner in Assam, that there is a similar plant, probably a different species, in the lofty range of hills to the northward of Gowhatti.

NAT. ORDER CI.—BORAGINEÆ.

These plants have alternate leaves, generally covered with rigid hairs, and are nearly allied to the Labiatæ, by their 4-lobed fruits. The flowers occur in unilateral spikes; a few of the species are ligneous or arborescent. They abound in the warmer parts of Europe, and in Asia. No important remedy is found in this family, which is usually watery, inodorous, and insipid. Some have been eaten by the ancients, and the borage is to this time deemed alimentary in France; one or two species are rather astringent. A peculiar colouring matter, of some commercial importance, exists in the cortical part of the roots of some species.

GEN. 1.—BORAGO.

Sp. Borago officinalis, Borage. Mucilaginous and watery, now obsolete.

GEN. 2.—ANCHUSA.

Sp. 1. *Anchusa italica*, (Bugloss.)

This plant is mentioned by Nicander v. 5, 38, and is called Bugloss, from the supposed resemblance of its leaves to a cow's tongue (Βος γλοσσα.) There is some doubt however as to the actual plant to which this term is applied. In India the Greek synonyms *bugloozun* and *fooghulus* are assigned to *Onosma bracheatum* (Royle.) In the Bombay Bazars the *Cacalia Kleinia* is similarly termed *Gao zuban*, or cow's tongue. The confusion however is but of little importance, as the article is destitute of any real medicinal value, being simply emollient, mucilaginous, and perhaps slightly diuretic.

Sp. 2. *A. tinctoria.* (Alkanet.)

A native of Europe, the root extensively used in dyeing. The plant is about two feet high, the roots cylindrical, 4 to 5 inches long, rather twisted, thick as the finger, hairy, covered with a foliaceous and wrinkled envelope, of deep violet red colour. Beneath this is a woody substance, red externally, whitish within, formed of three cylindrical fibres, distinct from each other, and as if soldered together. Destitute of odour, taste slightly saccharine and bitter.

For this root those of the *Onosma echioides*, and *tinctoria* have been substituted. The *Onosma emodi* (Wall.) of the

Himalayas is closely allied to this, and is called *Maharunga* from the intensity of its colour.

The alkanet of Constantinople is produced by a different order of plants altogether, being the root of the Alcanna vera, (Natural order, *Salicariæ.*) *Feé.*

Red Principle.

In masses of brown colour, resinous fracture, melting at a low heat, soluble in alcohol, ether, and the fatty oils, which assume a red colour, remaining still transparent; less soluble in water, forming blue compounds with potash, soda, baryta, and with lime, decomposed by hot sulphuric acid, changed into oxalic acid by the nitric acid. The alcoholic solutions treated by several metallic re-agents afford some beautiful lakes.

Orcanet is only employed in pharmacy as a colouring matter for ointments and pomatums. Its chief use is as a dye stuff, and for colouring sugared sweetmeats for confectioners.

Gen. 3.—Cynoglossum, Dog's tongue.

Sp. C. officinale.

Syn. Κυνογλοσσον Dioscorides.

Of no medicinal importance. The root yields a colouring matter of very little value.

Gen. 4.—Symphytum.

Sp. S. officinale.

Συμφυτον, Diosc. iv. p. 9. *Vern.* Sunkootun.

Roots large, externally black, and branching, about a foot long, the thickness of the finger, fleshy, brittle, succulent, and pulpy. Inodorous, taste sweetish and mucilaginous.

The plant is highly mucilaginous, and rather astringent, it also contains sugar and albumen. The recent root is in popular use in France in cases of rupture and bruises. Indeed the plant derives its name from its supposed virtue in consolidating wounds.

Gen. 5.—Heliotropium.

Sp. Heliotropium indicum. (Indian turnsole.)

Vern. Hatee shoora, *Beng.* Siriari, *Hind.* Srihastini, *Sans.* also Bhooroomdi.

Plant slighly bitter, juice of the leaves applied to painful gum-boils and to repel pimples on the face—also used in

inflamed or excoriated tarsi. A very common plant. In Jamaica it is used with castor oil to relieve the pain of scorpion stings, and in the treatment of hydrophobia.

Besides these, M. Feé mentions,

1. *Heliotropium peruvianum* and *grandiflorum*, these are distinguished, the first by the odour of vanilla, the second by that of honey.

2. *H. europæum*, commonly supposed to have the power of destroying warts.

3. *Pulmonaria officinalis*, and *angustifolia*—plants used in popular cough medicines on account of the supposed resemblance between the white spots on their leaves and ulcerated lungs.

4. *Lithospermum officinale.* The seeds are long, very white, and like small stones or pearls, on which account they have been popularly used as a remedy for stone. They are known in India by the name of Lubisfirmun. (*Royle.*)

Royle states that the species of Trichodesma are deemed diuretic, and are supposed cures for snake bites.

NAT. ORDER CII.—CORDIACEÆ.

A small order, formerly included in the Borragineæ, it chiefly inhabits tropical climates. Cordia is the only Indian genus, of which there are four or five Indian species.

GEN.—CORDIA.

Calyx tubular 4, 5-toothed, corolla funnel-shaped, or campanulate with a flat five or seven cleft limb, and a hairy or naked throat, stamens five, short, inserted into the throat of the corolla, style protruding, bifid, with four stigmas, ovary three-celled, drupe containing one stone with three cells, two usually abortive. (*Lindley.*)

Sp. 1. *C. latifolia.* Roxb. Fl. Ind. i. p. 588. Hindostan, confined to the southern parts of India. (*Royle.*)

Vern. Buhooari, *Beng.* Burra lesoora, *Hind.*

Branches numerous, spreading, and drooping, young shoots angular and smooth, trees usually 20 feet high at 10 or 12 years old. Leaves alternate, petioled, round, cordate, and ovate, often slightly repand, three-nerved, hard, smooth above, scabrous and pale beneath, from three to seven or

even eight inches long, and rather less broad, petioles nearly round and smooth, panicles short, terminal, and lateral, roundish. The branches alternate, diverging, and once or more frequently dichotomous; flowers numerous, small, white; bracts minute, villous; calyx villous, campanulate, leathery; mouth unequally toothed; corolla short, campanulate; segments five, linear, oblong; filaments as long as the segments of the corolla, and inserted immediately under their fissures. Anthers incumbent, ovary ovate, four-celled, with one ovule in each, attached to the upper end of the axis. Style short, stigma four-cleft, segments long, rugose, and recurved, drupe oblate, spheroidal, about 1 or $1\frac{1}{4}$ inch in diameter, smooth, when ripe straw-coloured, covered with a whitish bloom, pulp in large quantity, soft, clear, and very clammy, nut nearly circular, laterally compressed, rugose on the outside, with a cavity at each end, the lower one deeper than the other, exceedingly hard, four-celled, though rarely with all the cells fertile, integument single, white, soft, and oily, plumule very small, radicle conical, superior. (*Roxb.*)

Sp. 2. *Cordia Myxa.* Roxb. Fl. Ind. i. p. 590.

Syn. Sebestena officinalis.

Vern. Vidimaram, *Tam.* Kendal, *Jav.* Lebuck, *Avicenna.* Mochayet, *Forskal.* Lolu, *Cyng.* Buhooarie, *Beng.* Lesura, *Hind.* Nekra, *Tel.* Bukampadáruka, *Sans.*

A native of many parts of India, Persia, Arabia, and Egypt.

Trunk generally crooked, 8 to 10 feet high, and as thick or thicker than a man's body. Bark grey and cracked, branches numerous, spreading, and forming a dense shady head. Leaves ovate, oval, or obovate, 2 to 3 inches long, $1\frac{1}{2}$ to 2 broad, exterior half slightly scolloped or toothed. Panicles terminal, lateral, globular, dichotomous. Flowers numerous, small, white, many barren, calyx smooth, tubular, widening towards the mouth, and there as if torn into two or three divisions, corolla with revolute lobes, drupe globular, smooth, $\frac{3}{4}$ of an inch in diameter, sitting in the enlarged calyx; when ripe yellow, pulp almost transparent, very tough and viscid, nut cordate, at both ends bidentate and perforated, rugose, somewhat four-celled, seeds solitary. *Roxb.* The wood is soft, one of the best for affording fire by friction; supposed to be the material for the Egyptian mummy cases.

The fruit of *Cordia Myxa* has been long used as a medicine under the name of Sebistans or Lobestens. *C. latifolia* is supposed to produce the larger, *C. Myxa* the smaller variety of this article. The bark is deemed a mild tonic. That of

C. angustifolia, Roxb. (Goondnee) is much used for making astringent gargles.

The dried fruits are very glutinous in the fresh state. They are slightly laxative, but it is especially as a pectoral that they are esteemed in India. In Java the fruit is used in gonorrhœa and ardor urinæ; 12 drachms of the pulp are said to be equally in aperient effect to the same quantity of cassia pulp.

The seeds of Cordia Myxa, are called *Chakoon ke beenge*, and deemed an infallible remedy in ringworm, the powder mixed with oil being applied to the eruption.

NAT. ORDER CIII.—CONVOLVULACEÆ.

This extensive order is made up of herbaceous plants and shrubs with twining stalks, generally alternate leaves, and axillary flowers, usually borne on unifloral or multifloral peduncles; the species are mostly lactescent.

The stalks, leaves, flowers, and fruits of the annual convolvulaceæ are inert, and very slightly active. The roots are vivaceous, gorged with a milky juice, almost entirely resinous, and generally possessing purgative properties. The bark in the woody species, though not equal in power to the root, is still acrid, and acts as a stimulant, and purgative. Lindley in his Flora Medica distributes the medical plants of this order into the following genera—species of all of which occur in the plains of India, and a few on the Himalayas.

Gen. 1.—Argyreia.

Sepals five, corolla campanulate, style one, stigma capitate, two-lobed, ovary two-celled, four-seeded, capsule baccate. (*Lindley.*)

Sp. A. bracteata. Wall. Cat. 1419, common near Madras.

(Sanscrit) *Samudra patta.*?

A large twining, branched, milky shrub. Leaves alternate on long petioles, limb broadly cordate, ovate, beneath hairy and rather silky, peduncles axillary, dividing at the extremity into two or three branches, with a sessile ebracteated flower in the fork, each branch divides again: the solitary flower in the second, and all succeeding divisions furnished

with a long lanceolate-leaved pale green hairy bractea, calyx of five ovate and mucronate hairy sepals, corolla campanulate, externally hairy, colour purple white within, near the bottom deep purple, paler near the throat, limb spreading, cream-coloured, stamens five, unequal, enlarged at base, ovary superior in a glandular cup-shaped disk, style as long as the stamens, stigma two-lobed, pericarp a three to four seeded berry, deep orange when ripe. *(Wight.)*

A decoction of the leaves is used in fomentations to the joints in scrofulous affections, and the boiled leaves are applied as a poultice.

Argyreia speciosa, is found wild in the Dhoon.

Gen. 2.—Convolvulus.

Sp. 1. *C. Scammonia.*

A native of Syria and the Levant, recently discovered by Dr. Burn in Kaira in Guzerat.

The stalk is cylindrical, thin, rather velvety, climbing, leaves alternate, smooth, triangular, hastate, supported on petioles 8 or 10 lines long, flowers large, bell-shaped, of whitish purple colour. Roots long, thick, fleshy and succulent. The proper juice when dried is called *Scammony.*

Aleppo Scammony. (Sugmoonia, *Arab.*)

Fragments voluminous, dry, light, spongy, friable, pulverulent, with dull fracture of blackish grey, but covered with grey powder resulting from the reciprocal friction of the pieces, slightly transparent in small flakes, which become white and rather adherent when rubbed with a wet finger, odour disagreeable, taste weak, acrid, bitter, and repulsive, powder greyish white.

This species of scammony is often adulterated with concrete juices of a similar kind, with flour, chalk, sand, and earth. According to the analysis of Boutron La Grange and Vogel, good scammony consists of resin 60, gum 3, extract 2, and earthy and vegetable impurities 25 per 100.

The most abundant harvest of scammony is in Smyrna and Aleppo. There are several modes of collection, which give rise to corresponding commercial varieties. The neck of the root being laid bare is divided transversely, and shells placed around the edges to receive the juice as it exudes. This subsequently thickens in the air. The drug collected in this mode, is called shell scammony.

This occurs in small porous masses, sometimes smooth, of reddish or whitish grey colour; of waxy fracture, yellowish and half transparent, in thin layers, of disagreeable taste and smell; on drying it becomes adhesive.

Instead of shells the leaves of the chesnut tree are sometimes used, and a flattened scammony of good quality collected. If the roots be cut in successive layers, the scammony is inferior, but still esteemed. It is dried either over a slow fire or before the sun, and then moulded into stamped pastiles, of a whitish colour. This variety is very rare in commerce.

Lastly, an extract is prepared from the expressed juice of the roots and stalks, this is moulded into round masses, of black, vitreous, and resinous fracture.

The Arab name of this drug, Ul Sugmoonia, signifies the *purgative*. Several old preparations called "diagredium" (διακρηδιον) are mixtures of scammony with sulphur and liquorice, and are now no longer used.

Scammony is one of our most valuable cathartics, especially for children—dose from 2 to 20 grs. It is usually given with cream of tartar, and it enters into the composition of the well known compound Colocynth pill.

Sp. 2. C. scoparius, Canary Islands.

To this climber is attributed the well known wood perfumed like the rose.

The root is knotty, woody, heavy, sometimes branched, 1 to 4 inches in diameter, with a fungous, wrinkled, reddish grey bark. The wood is hard, heavy, deep dun yellow, veined with red, takes fire readily at the candle flame. On being rasped or worked it evolves a strong smell of roses; its taste is bitter and balsamic. By distillation from salt water it yields an essential of the following characters:—

Colour golden-yellow passing to ruddy red by age, heavier than water, rose-like odour, bitter and balsamic taste. Often adulterated with fixed oil.

This substance has been long attributed erroneously to the *Genista canariensis*.

M. Feé also enumerates the following species:—

C. sepium, hedge weed, common in Europe, believed to be purgative.

C. arvensis, field-bind, the same as C. sepium. Vauquelin analysed both, and found them to yield about 5 per 100 of cathartic resin.

C. Soldanella, (golden rod) root contains 24 per 100 of purgative resin.

C. althæoides, South of France.

C. Batatas, Sweet potatoe. (Batatas edulis, *Choisy*.)

Gen. 3.—Ipomæa.

Sp. 1. *I. Jalapa.* Jalap plant.

Syn. Convolvulus Jalapa, *Linn.* Ipomæa Purga, *Wenderoth.*

Leaves stalked, the first hastate, succeeding ones cordate, acuminate, mucronate, smooth. Peduncles axillary or flowered, twisted, the length of the corolla. Sepals obtuse mucronate, smooth, corolla purple, with a long, somewhat clavate tube, and an undulated limb with 5-plaits, filaments smooth, unequal, anthers linear, projecting, stigma capitate, deeply furrowed, capsule 2-celled, cells 2-seeded. (*Lindley.*)

A native of South America, Xalappa, and on the Eastern declivity of the Mexican Andes. The roots are fleshy, large, oval oblong, rugose, and blackish externally, while recent; in the dry state, and as sold in the shops, they are cut in flakes of variable diameter, sometimes cleft lengthwise and pyriform. If entire they are usually small, wrinkled, heavy, unequal, hard, brittle, deep brown grey externally, of a dirty grey within, fracture smooth and wavy, shewing a great number of resinous points, visible to the lens, and often to the naked eye.

The odour is peculiarly nauseous, though weak. The taste acrid and disgusting. A brisk cathartic.

The powder is of brown grey colour, and must be prepared with caution, as it is exceedingly irritating. The worm-eaten roots are much more active than the sound, as the worms only attack the amylaceous and sweet parts.

According to Cadet's analysis the jalap of the shops contains water 24, resin 50, gummy extract 220, fecula and albumen 25, fibre 145, salts, silica, and loss 35 in 500 parts; jalap of good quality will however yield 10 per cent. of resin, in which principle the purgative virtues reside. Mr. Hume having brought this resin to an unusually pure state supposed it to be a new alkali, and termed it *jalapine.*

The resin of jalap is dry, brittle, readily reduced to powder, in rolls of elongated or spiral form, the size at most of the little finger, greyish yellow, dull, unequal, and chinked

externally, of brilliant fracture, and yellowish brown while recent. Totally soluble in alcohol, insoluble in ether, inodorous until rubbed, when the peculiar smell of jalap is evolved; its taste is nauseous and very acrid.

This resin is exposed to numerous adulterations, especially with other resins, of which that of the Guaiac is most used; the perfect insolubility of the jalap resin in ether will lead to the detection of numerous frauds of this description.

Jalap root was first brought to Europe about the year 1610, but its origin was long uncertain. The size to which it attains varies very much. Thierry de Menonville describes roots 20 lbs. in weight, and Michaud sent from Charlestown to the Jardin des Plantes at Paris a root which weighed over 50 lbs.

In 1834, Lord Auckland introduced into the Calcutta Garden, a plant supposed to be the Linnæan Convolv. Jalapa, but which is a very distinct species, called *Ipomœa macrorrhiza*, a native of Georgia and Carolina. It perfectly succeeded, and the roots attained such an enormous size that we have seen a cluster belonging to one plant which weighed 79 lbs.; while recent it was fleshy, white, juicy, of mild flavour, and altogether devoid of the acrid resin. It had a sweetish taste, and has been eaten by several persons without any ill effect being experienced.

We should add, however, that to test the applicability of the root as fodder, we had seven sheep fed on it, six of which died suffering from diarrhœa within a month.

According to Humboldt 400,000 lbs. weight of jalap roots are annually exported from Vera Cruz. The plant thrives best on cool shady hills, about 2000 feet above the level of the sea.

Med. use. A most valuable purgative, dose 10 to 30 grs. usually given with twice its weight of cream of tartar and a little ginger.

Sp. 2. Ipomœa Mechoacanha, Mexico and Brazil.

This is now referred by Lindley to some variety of the Ipomæa orizabensis, a native of the temperate parts of the state of Oaxaca. An account of the root has been published by Pelletier in the Journal de Pharmacie, vol. x. p. 1. The experiments made with it in the French Hospitals have not been satisfactory.

The roots are divided in fragments of variable form, or in whitish slices, fibrous, softish, covered with a grey, wrinkled

bark, solid white, and yellowish white internally, inodorous; at first insipid, then nauseous to the taste, almost always worm-eaten as sold in the shops, said to be frequently adulterated with the bryony root; no good analysis is on record of this root. It is said to be devoid of resin, but to contain an acrid principle of an oily character, soluble in alcohol, and exceedingly bitter. The purgative properties of the root are however comparatively trifling. It was known in Europe before the true jalap, Monard having described it in his history of American remedies, published in Seville, in 1595.

Sp. 3. *Ipomæa Turpethum.*

Vern. Teoree, Doodh-kulmee, &c. *Hind.* and *Beng.*

Syn. Convolvulus Turp :—a native of Bengal, Ceylon, and India generally. *Roxb. Fl. Ind.* i. p. 476.

Root perennial, stems twining, several fathoms long, 3 to 4 sided, a little downy, with winged angles, leaves stalked, varying in form from cordate to linear, all pointed and lobed, or angular and downy. Peduncles axillary and many flowered, flowers large, white, bractes oval, concave, velvety, deciduous, ovary on a glandular disk, stigma 2-lobed, capsules involved in the dry calyx, 4-sided, 2-celled, opening by an operculum, seeds round, black, one in each cell.

The recent roots are very long, cylindrical, bent, branched, gorged with acrid milky juice, the dried roots are in broken pieces the thickness of the finger, and 4 or 5 inches long. They are separated from the ligneous part, and consist of a grey or slightly reddish cortical system, composed of parallel longitudinal fibres, and of proper vessels in which particles of resin are observed; inodorous, tasteless at first, subsequently nauseous and acrid.

Boutron-Charlard's analysis shews that this root contains resin, fatty matter, volatile oil, albumen, starch, yellow colouring matter, fibre, free malic acid, and various salts.

The natives of Bengal use this root as a purgative, rubbing up a slip of the bark with water on a stone and swallowing the emulsion thus formed.

A strip six inches in length from a root as thick as the little finger is deemed a sufficient dose.

Mr. Gordon, Dr. Glass, and Dr. Wallich have published several notices of its effects in Carey's edition of Dr. Roxburgh's Fl. Ind. ii. p. 57. We have also subjected its properties to careful clinical experiment, and we feel warranted in asserting that the action of the medicine is so extremely uncertain that it does not deserve a place in our Pharmacopœia.

Gen. 4.—Batatas.

Sp. B. paniculata. (*Convolvulus paniculatus*, Roxb. Fl. Ind. i. 478.) East Indies generally.

Vern. Bhoomi koomra, *Beng.*

Root perennial, tuberous, young shoots round and smooth, stem and branches perennial, leaves stalked, palmate, three to six inches long, generally five-lobed, entire, smooth, peduncles axillary, erect, pedunculate, flowers numerous, large, beautiful reddish purple, capsules four-celled, seeds woolly all round. The large tuberous root is cathartic.

Gen. 5.—Pharbitis.

Sepals five, corolla campanulate, or campanulate funnel-shaped, style 1, stigma capitate, granular, ovary three-celled, or rarely four-celled, cells two-seeded. (*Lindley.*)

Sp. 1. *Pharbitis cærulea.* Wall.

Syn. Ipomæa cærulea. *Kön. Roxb. Fl. Ind.* i. p. 501. Nearly allied to Pharbitis Nil; but probably a distinct species.

Vern. Hub ul nil, *Arab.* Kaladana and Mirchai, *Hind.* and *Beng.*

Common all over the tropics every where, and in India even ascends the mountains to 5000 feet elevation.

Stems and branches twining, annual, round, hairy, 6 to 12 feet long, as thick as a crow's quill, leaves stalked, broad, cordate, three-lobed, downy, two to four inches long, acute, peduncles axillary, round, hairy, two to three flowrets, bracts and sepals linear, flowers large, beautiful bright blue, stigma sub-globose, large, glandular, three-lobed, capsule much shorter than the calyx, smooth, three-celled, with two seeds in each cell. (*Roxb.*)

Seeds, Hub ul nil, Kaladana, Mirchai.

Black, angular, weighing on an average ½ a grain each, in powder of a grey colour, of sweetish, and subsequently rather acrid taste, and heavy smell. On analysis yields resin, gum, starch, fixed bland oil, fibre, and colouring matter.

The powdered seeds in doses of 30 to 40 grains act as a quick, safe, and pleasant cathartic. We have made this seed the subject of numerous experiments. In 100 cases in which it was given under our direction in the Police Hospital of Calcutta it proved purgative in 94, occasioned vomiting in 5, and griping but in 15, and produced on an average 5 stools within 2½ hours; the operation generally commenced in an

hour, and in these experiments was never delayed beyond four hours.

The alcoholic extract, which consists of resin and oil, is deep brown, ductile, of excellent pillular consistence, and keeps for several months. In 10 grain doses it produces all the effects of jalap with certainty and speed; the taste is scarcely perceptible. Dr. Chapman has used it in several cases at the General Hospital, and reported on it most favourably to the Medical Board; Dr. Leckie of Bhagulpore, Dr. Green of Howrah, Drs. Martin, Stewart and Goodeve, have given similar accounts of its efficacy.

The seeds sell for four seers (8 lbs.) for the rupee; these will yield from 15 to 20 per 100 of alcoholic extract, and the whole of the alcohol may be recovered by distillation. We have thus a remedy of unparalled cheapness, perfectly equal to jalap as a cathartic, superior to it in portability and flavour, and occurring in all parts of India. We are consequently independent in every respect of the South American article.

Besides the plants above described, Lindley quotes others of less importance, which we do not deem it necessary to include in our notice.

In Ainslie and other writers we find notices of the following:—

— *Convolvulus grandiflorus.* (Ainslie, vol. ii. 219.)

Nagha mooghatei kai, *Tam.* Munda Valli, *Rheede.*— Puthmapoo todemie, *Sans.* Alanga, *Cyng.*

Moonflower. Common on the Coromandel coast.

Capsule or pericarp containing four seeds the size of kidney beans, when dried used in snake-bites; dose three daily in powder.

— *Convolvulus reptans,* Mandavalli, *Rheede*, common in India, affords a milky juice which when dried is nearly equal to scammony in purgative efficacy. (*Ainslie*, on the authority of Plumier and the Hortus Malabaricus.) This plant is the Olus vagum of *Rumph.* Kulmi shak, *Beng.* Tootu kura, *Tel.* a native of standing sweet waters, very common. The tops and leaves are eaten in stews by the natives.

— *C. malabaricus.* Paymoostee, *Tam.* Kattu kelungu, *Rheede*, a native of the Malabar coast and of Cochin China, considered by the farriers in India a good horse medicine.

Roxburgh in his *Flora Indica*, pp. 466 to 487, describes 34 species of Convolvulus, and pp. 497 to 504, eleven species of Ipomæa.