ELEMENTS

OF

MATERIA MEDICA.

SUB-DIVISION III. CALYCIFLORÆ, *De Cand.*

Calyx gamosepalous, i. e. *sepals more or less united at the base. Torus more or less adnate to the inside of the calyx at the base. Petals and stamens inserted into that part of the torus adnate to the calyx, and, therefore, commonly said to arise from the calyx. Petals free or united. Ovary free or adnate to the calyx.*

ORDER LI. PYROLACEÆ, *Lind.*—WINTER-GREENS.

CHARACTERS.—*Calyx* free, 4–, more frequently 5–partite, persistent. *Petals* 5, free or cohering, perigynous? with an imbricated æstivation. *Stamens* twice the number of the petals, to which they are not adherent; *anthers* bilocular, dehiscing by 2 pores. *Ovarium* 3– to 5–celled, seated on a hypogynous disk. *Style* 1. *Stigma* roundish or lobed, sometimes slightly indusiate. *Capsule* 3– to 5–celled, 3– to 5–valved, loculicidal-dehiscent. *Placentæ* adherent at the centre. *Seeds* indefinite, minute, with a pellicle indusiate or winged. *Embryo* minute, at the base of fleshy albumen, with moderately distinct cotyledons.—*Herbs*, natives of the northern atmosphere, perennial or scarcely *under-shrubs*, smooth. *Stems* round, naked, or leafy. *Leaves* simple, entire or dentate. *Flowers* racemose, somewhat umbellated, rarely solitary, white or rose-coloured. (*De Cand.*)

PROPERTIES.—In structure, proximate principles, and medicinal properties, this order is allied to Ericaceæ. Its prevailing principles are bitter, resinous, and astringent substances.

214. CHIMAPHILA UMBELLATA, *Nuttall.*—PIPSISSEWA; UMBELLATED WINTER-GREEN.

Chimaphila corymbosa, *Pursh.*—Pyrola umbellata, *Linn.*

Sex. Syst. Decandria, Monogynia.

(Herba, *L.*—Herb, *E. D.*)

HISTORY.—The Pipsissewa was employed medicinally by the aborigines of America. It was first described and figured by Clusius,[1] who termed it *Pyrola* 3 *vel frutescens;* and it was introduced to the notice of the profession, in 1803, by Dr. Mitchell.[2] Monographs on it have been published by Elias Wolf,[3] and by Radius.[4] Its generic name is derived from χεῖμα, *winter*, and φίλος, *a friend.*

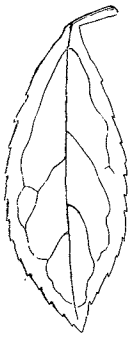
[1] *Historia Pannonica.*
[2] *Inaug. Diss.* Philad. 1803.
[3] *Diss. de Pyrola umbell.* Goett. 1817.
[4] *Dissert. de Pyrola et Chimoph.* Spec. i. 1821; Spec. ii. 1829.

BOTANY. **Gen. Char.**—*Calyx* 5-cleft. *Petals* 5, spreading, deciduous. *Stamens* 10, 2 in front of each petal; *filaments* dilated in the middle. *Ovarium* rounded-obconical, obtusely angular, umbilicated at the apex. *Style* very short, concealed in the umbilicus of the ovary. *Stigma* orbicular, tuberculated, 5-crenate. Cells of the *capsule* dehiscent at the apex; the valves not connected by tomentum (*De Cand.*)

Sp. Char.—*Filaments* smooth. *Bracts* linear-awl-shaped. *Leaves* cuneate-lanceolate, of the same colour (*De Cand.*)

A perennial *under-shrub*. *Rhizome* woody, creeping. *Stems* ascending, somewhat angular, marked with the scars of former leaves. *Leaves* in irregular whorls, evergreen, coriaceous, on short petioles, serrate, smooth, shining. *Flowers* nodding in a small corymb. *Corolla* white, tinged with red, having an agreeable odour.

FIG. 1.



Hab.—Woods of Europe, Asia, and more frequently North America.

DESCRIPTION.—The officinal parts are the leaves (*folia chimaphilæ* seu *pyrolæ*), or rather the leaves and the stems (*herba chimaphilæ* seu *pyrolæ*). The fresh leaves exhale a peculiar odour when bruised: their taste is bitter and astringent. The infusion of the dried herb is rendered green (*tannate of iron*) by sesquichloride of iron, and very slightly turbid by a solution of isinglass.

Chimaphila maculata, or *spotted winter-green*, probably possesses similar virtues to the *C. umbellata*. "The character of the leaves of the two plants will serve to distinguish them. Those of C. maculata are lanceolate, rounded at the base, where they are broader than near the summit, and of a deep olive-green colour, veined with greenish white; those of the officinal species are broadest near the summit, gradually narrowing to the base, and of a uniform shining green. In drying, with exposure to light, the colour fades very much, though it still retains a greenish hue" (Wood[1]).

COMPOSITION.—This plant has been analysed by Elias Wolf and by Fr. Martens:[2] their results are as follows:—

Wolf's Analysis.		*Marten's Analysis.*	
Bitter extractive	18·00	Bitter gummy extractive, with a small quantity of tannin and some vegetable calcareous salts	16·05
Resin	2·40	Oxidised extractive	1·25
Tannin	1·38	Soft resin and chlorophylle	3·00
Woody fibre, with a small proportion of gum and vegetable calcareous salts	78·22	Balsamic hard resin	5·30
		Tannin with gallic acid	3·30
		Woody fibre	63·60
		Moisture and loss	7·50
	100·00		100·00

The activity of the plant resides, in part at least, in the *bitter extractive*, *resin*, and *tannic acid*; but it is probable that there is also some volatile constituent (*essential oil?*) in the fresh plant to which the medicinal properties of the plant are in part due.

PHYSIOLOGICAL EFFECTS.—The fresh leaves appear to possess considerable acridity, depending, probably, on some volatile constituent; for

[1] *United States Dispensatory.*
[2] Martiny, *Encyklop. d. med. pharm. Natural u. Rohwaarenkunde*, Bd. i. p. 753, 1843.

Dr. Barton says, that, when bruised, they produce rubefaction, vesication, and desquamation, if applied to the skin.

The infusion of the dried leaves, when swallowed, acts as a tonic, producing an agreeable sensation in the stomach, and assisting the appetite and digestive process. It promotes the action of the secreting organs, more especially the kidneys, over which, indeed, it has appeared to exercise a specific influence; increasing the quantity of urine; diminishing, as some have imagined, the quantity of lithic acid or lithates secreted; and beneficially influencing several forms of chronic nephritic disease. Indeed, this plant possesses, in its medicinal as well as its natural-historical and chemical relations, qualities analogous to those belonging to Uva-ursi.

USES. — The following are the principal diseases in which it has been employed: —

1. *In dropsies*, accompanied with great debility and loss of appetite, it is useful as a diuretic, as well as on account of its stomachic and tonic qualities. It was introduced to the notice of practitioners in this country, as a remedy for this class of diseases, by Dr. W. Somerville.[1] Dr. Beatty[2] has also found it useful in this disease.

2. *In chronic affections of the urinary organs.* — Pyrola has been found serviceable in the various disorders of the urinary organs, in which the Uva-ursi frequently proves beneficial; such as cystirrhœa and calculous complaints. It has occasionally alleviated some cases of hæmaturia, ischuria, dysury, and gonorrhœa.

3. *In scrofula.* — We can readily believe that, as a tonic, this remedy may be useful in various forms of scrofula. But it has been supposed by some to possess almost specific powers; and in America its reputation is so high, that in the provinces it acquired the title of "*King's Cure.*" Dr. Paris[3] says that "an irregular practitioner, who has persuaded a number of persons in this metropolis that he possesses remedies obtained from the American Indians, by which he is enabled to *cure* scrofula in its worst forms," relies for success on chimaphila. In some ill-conditioned scrofulous ulcers pyrola is used in the form of a wash.

ADMINISTRATION. — Chimaphila is given in the form of *decoction* or *extract:* the latter has been employed in doses of ten or fifteen grains.

DECOCTUM CHIMAPHILÆ, L.; *Decoctum Pyrolæ*, D; *Decoction of Umbellated Winter-Green.* (Chimaphila, ℥j.; Distilled Water, Oiss. Boil down to a pint and strain, *L.* — The *Dublin College* orders of Leaves of Winter-Green, dried, ℥ss.; Water, Oss. Boil for ten minutes in a covered vessel, and strain.)—Dose, f℥j. to f℥ij.

ORDER LII. ERICACEÆ, *Lindley.* — HEATHWORTS.

ERICÆ, *Juss.*—ERICEÆ, *R. Brown.*

CHARACTERS. — *Calyx* 4- or 5-partite, almost equal, entirely unadherent to the ovary, persistent. *Corolla* perigynous, or somewhat hypogynous, gamopetalous, 4- or 5-partite, or with 4 or 5 distinct petals, regular or more rarely irregular petals imbricated

[1] *Med.-Chir. Trans.* v. 340.
[2] *Trans. of the King and Queen's Coll. of Phys., Ireland,* vol. iv. p. 23.
[3] *Pharmacologia.*

by æstivation. *Stamens* definite, equal or double in number to the petals, entirely or almost free from the corolla. *Anthers* 2-celled; cells hard, dry, separate either at the apex or base, often furnished with some appendage, dehiscing by a terminal pore. *Ovary* free, surrounded at the base by a disk, which is sometimes nectariferous. *Style* single, rigid. *Stigma* undivided, toothed, or 3-lobed. *Fruit* capsular, many-seeded, many-celled; dehiscence varies. *Seeds* inserted in a central placenta, small, indefinite; the *testa* firmly adhering to the nucleus. *Embryo* round; in the axis of fleshy albumen; the radicle opposite to the hilum.—*Shrubs* or *under-shrubs*, rarely small *trees*. *Leaves* alternate, rarely somewhat opposite or verticillate, without stipules, usually rigid, entire, evergreen, articulated on the stem. (*De Cand.*)

PROPERTIES.—The medicinal qualities of the officinal heathworts are due to tannic acid (as in Uva-ursi), and to volatile oil (as in *Gaultheria procumbens*). In the tribe *Rhodoreæ* are found several species remarkable for their narcotic and poisonous properties; as *Kalmia latifolia*, *Rhododendron chrysanthum*, and *Azalea pontica*. The poisonous properties of Trebizond honey are due to the latter plant (see *Honey*).

215. ARCTOSTAPHYLOS UVA-URSI, *Sprengel.*—THE BEAR-BERRY.

Arbutus Uva-ursi, *Linn.*

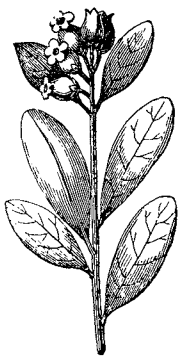
Sex. Syst. Decandria, Monogynia.

(Folium, *L.*—Leaves, *E. D.*)

HISTORY.—Some doubt exists whether this plant was known to the ancient Greeks and Romans. Bauhin[1] and some others think that it is the ἰδαία ῥίζα of Dioscorides;[2] but the leaves are very unlike those of *Ruscus aculeatus* (ὀξυμυρσίνη), to which he, as well as Pliny,[3] compares them. The ἄρκτου σταφυλή of Galen agrees better with the Uva-ursi, though the short description of it applies also to Ribes rubrum.[4]

BOTANY.—**Gen. Char.**—*Calyx* 5-partite. *Corolla* ovate-urceolate; the mouth 5-toothed, revolute, short. *Stamens* 10, inclosed; *filaments* somewhat dilated at the base, hairy-ciliate; *anthers* compressed, with 2 pores at the point, laterally 2-awned, awns reflexed. *Ovarium* globose-depressed, surrounded with 3 scales; *style* short; *stigma* obtuse. *Berry* (or berried drupe) globose, 5-, rarely 6-, 7-, or 10-celled; cells 1-seeded (*De Cand.*)

FIG. 2.



Sp. Char.—Procumbent. *Leaves* coriaceous, persistent, obovate, quite entire, shining. *Flowers* disposed in terminal small racemes. *Bractlets* beneath the pedicles, obtuse, small (*De Cand.*)

Stems woody, round, and trailing. *Leaves* alternate, stalked, evergreen; convex and wrinkled above; concave and paler beneath. *Bractlets* coloured. *Sepals* pale-reddish, permanent. *Corolla* rose-coloured, smooth. *Berry* globose, scarlet, mealy within, very austere, and astringent. *Seeds* seldom more than 4 or 5, though there are the rudiments of 8 or 10.

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[1] *Pinax*, p. 470.
[2] Lib. iv. cap. 44.
[3] *Hist. Nat.* lib. xxvii. cap. 69, ed. Valp.
[4] Murray, *De Uva-ursi: Opuscula*, 19–20.

HAB. — Indigenous. Northern parts of Europe, Asia, and America. On dry, stony, and alpine heaths.

DESCRIPTION.—The dried leaves (*folia uvæ-ursi*) are of a dark, shining, green colour, and have a bitter astringent taste, but no odour. Their under surface is reticulated.

The leaves of *Vaccinium Vitis Idæa* (*Red Whortleberry*) are said to be occasionally substituted for those of Uva-ursi. The fraud (which is unlikely to occur in this country) may be detected by the edges of the leaves being minutely toothed, and the under surface dotted; whereas the edges are entire, and the under surface reticulated, in the genuine leaves. Furthermore, the false leaves are deficient in astringency, and their watery infusion is coloured green by sesquichloride of iron, but does not form any precipitate with gelatine; whereas the true ones are highly astringent, and their watery infusion forms a blackish-blue precipitate with the sesquichloride of iron.[1]

COMPOSITION. — Uva-ursi leaves were analysed, in 1809, by MM. Melandri and Moretti,[2] and in 1827 by Meissner.[3] The constituents in 103 parts are, according to the last-named chemist, *gallic acid* 1·2, *tannic with some gallic acid* 36·4, *resin* 4·4, *oxidised extractive, with some citrate* (?) *of lime* 0·8, *gum with supermalates of lime and soda, and traces of tannin and common salt*, 3·3, *chlorophylle* 6·3, *gum* (*pectic acid?*) *extracted by potash* 15·7, *extractive obtained by potash* 17·6, *lignin* 9·6, *and water* 6·0 (excess 1·3).

PHYSIOLOGICAL EFFECTS. *α. On Animals generally.*—Most animals refuse to eat this plant: there are, however, some few exceptions to this statement. Birds, it is said, will eat the berries; and Murray[4] tells us that two kinds of insects feed on the plant, one of which (a species of Coccus) yields a crimson dye. Girardi[5] found that an infusion of the leaves might be injected into the urinary bladder of animals with impunity; but, when taken internally, it excited vomiting and contraction and inflammation of the stomach.

β. On Man. — The obvious effects of Uva-ursi are those of the vegetable astringents before described. Its activity as an astringent depends on tannic and gallic acids. The former of these acids, in its passage through the system, becomes oxidised and converted into gallic and pyrogallic acids, and humus-like substances, which communicate a dark colour to the urine.

Uva-ursi slightly augments the quantity, and also somewhat modifies the quality, of the urine. Alexander[6] found that ʒss. of the powder acted as a mild diuretic; and I have frequently seen lithic deposits in the urine lessened under its use. In large doses the powder readily nauseates.

USES.—As an astringent, it is applicable to all the purposes for which the vegetable astringents generally are used. It has been employed

[1] See Braconnot, *Bull. de Pharm.* iii. 348; and Bouillon-Lagrange, *Ann. de Chim.* lv. 46.
[2] *Bull. de Pharm.* i. 59.
[3] Gmelin, *Handb. d. Chem.* ii. 1294.
[4] *Opuscula*, p. 98.
[5] *De Uva Ursina* [Sandifort, *Thesaurus*, ii. 453], Patavi, 1764.
[6] *Exp. Essays*, p. 151.

as an antidote in poisoning by ipecacuanha (see *Ipecacuanha*). But the principal use of this remedy is in *chronic affections of the bladder*, attended with increased secretion of mucus, and unaccompanied with any marks of active inflammation. Thus, in the latter stages of catarrhus vesicæ, the continued use of Uva-ursi is frequently most beneficial. Combined with hyoscyamus, says Dr. Prout,[1] and persevered in steadily *for a considerable time*, it seldom fails to diminish the irritation and quantity of mucus, and thus to mitigate the sufferings of the patients. "It undoubtedly possesses," he adds, "considerable powers in chronic affections of the bladder, *for which only it is adapted*, its operation being slow and requiring perseverance." Sir Benjamin Brodie,[2] on the other hand, observes that "Uva-ursi has the reputation of being useful in some cases of chronic disease of the bladder, and in this [inflammation] among the rest. I must say, however, that I have been disappointed in the use of Uva-ursi, and that I have not seen those advantages produced by it which the general reputation of the medicine had led me to expect. I have seen much more good done by a very old medicine" — the root of the Cissampelos Pareira. Such are the opposite statements of the effects of this remedy, made by two of the most eminent writers on diseases of the urinary organs. My own experience of it amounts to this: that in some cases the relief obtained by the use of it was marked; whereas, in other instances, it was of no avail. It is to be remembered that its astringent operation unfits it for acute cases, and that the alteration which it produces in the condition of the urinary organs is affected very slowly; so that, to be beneficial, it requires to be exhibited for a considerable period. *In calculous affections* it has occasionally given relief. De Haen[3] and Van Swieten[4] speak of the good effects of it in these cases. It alleviated the pain, checked the purulent and mucous secretion, and restored the urine to its natural condition. These effects seem to have arisen from its influence over the kidneys and bladder, for it did not appear to affect the calculus. I have already stated that it has appeared to me to lessen lithic deposits in the urine. In *chronic bronchial affections*, with profuse mucous or purulent secretion, it may occasionally prove serviceable. Dr. Bourne[5] gave it in powder (in doses of from 8 to 20 grs.) three times daily, in milk, with success. [Mr. Harris, in the Virginia Medical Journal, has recommended Uva-ursi as a substitute for ergot of rye in protracted labour.—ED.]

ADMINISTRATION. — The dose of the *powder* is from ℈j. to ʒj. But the "powdered leaves of this plant are so bulky and disagreeable, that few stomachs will bear to persevere long enough in the use of the requisite quantity; and the case is pretty much the same with the *infusion* and *decoction*."[6] On this account the *extract* is frequently preferred.

1. DECOCTUM UVÆ URSI, L. D.; *Decoction of Bear-berry*. Uva-ursi, ʒj.;

[1] *On Affect. of the Urinary Organs*, pp. 185 and 268, 2d edit. 1825.
[2] *Lond. Med. Gaz.* vol. i. p. 300.
[3] *Rat. Med.* t. ii. p. 63.
[4] *Commentaries*, t. xvi. p. 300.
[5] *Cases of Pulmonary Consumption*, &c. *treated with Uva-ursi*, 1805.
[6] Prout, *op. cit.* p. 185.

Distilled Water, Oiss. Boil down to a pint and strain, *L.*—The *Dublin College* orders of Uva-ursi, ℥ss.; Water, Oss. Boil for ten minutes in a covered vessel, and strain.)—Dose, f℥j. to f℥iij. three times a day.

2. **EXTRACTUM UVÆ URSI.**, L.; *Extract of Bear-berry.* (Uva-ursi, bruised, lb. iiss.; Boiling Distilled Water, Cong. ij. Macerate for twenty-four hours; then boil down to a gallon, and strain the liquor while hot; lastly, evaporate to a proper consistence.)—Dose, grs. v. to grs. xv. twice or thrice daily.

216. Gaultheria procumbens, *Linn.*—Partridge-Berry.

Sex. Syst. Decandria, Monogynia.

(Leaves.)

Gautiera repens, Rafinesque,[1] Med. Fl. of the United States. In different parts of the United States it is known by different names; as *Grouse-berry*, *Deer-berry*, *Spice-berry*, *Tea-berry*, *Mountain-tea*, *Winter-green*, *Box-berry*, &c.

A small shrubby evergreen. Stem prostrate, smooth; with ascending branches. Leaves obovate, with setaceous serratures, acute at either end. Pedicels bearing 1–2 nodding flowers. Calyx 5-lobed, white. Corolla white, urceolate. Capsule small, 5-celled, inclosed within the fleshy calyx, and presenting the appearance of a bright scarlet berry. Grows in America from Canada to Virginia.

The leaves and other parts of the plant contain a peculiar volatile oil (*oil of partridge-berry*, or *oil of winter-green*), to which their aromatic qualities are due. The leaves also contain *tannin*.

The leaves are aromatic, stimulant, and astringent. In infusion they have been employed, under the name of *Mountain* or *Salvador Tea*, as a substitute for China tea. Like some other stimulants, they have been thought to promote the catamenia and milk. As astringents, they have been used in chronic diarrhœa. But they are chiefly employed on account of their agreeable flavour, and to yield the essential oil.

The *volatile oil of partridge-berry* (*oleum gaultheriæ*, Ph. United States) has occasionally been imported, and sold in England under the name of *oil of wnter-green*. It is obtained chiefly in New Jersey, by submitting the leaves of the plant to distillation with water. As usually met with in commerce, it has a brownish-yellow, or pinkish colour: that which I have met with in England was pinkish-yellow. By redistillation it becomes colourless. It is the heaviest of all the volatile oils; its sp. gr. being 1·173 at 50° F.; and this character, therefore, becomes a test of the purity of the oil. Its boiling point is 412°.[2] Its taste is sweetish, pungent, and peculiar; its odour characteristic and agreeable. It solidifies when dropped into a solution of potash or soda. The aqueous solution of the oil assumes, on the addition of a persalt of iron, a violet colour (*salicylate of the peroxide of iron*). The commercial oil consists, according to Cahours,[3] of two volatile oils,—one light, the other heavy. The *light oil of partridge-berry*, or *gaultherylene* ($C^{20}H^{16}$), constitutes about $\frac{1}{10}$th part of the commercial oil, and forms the first portion which distils over. It is a colourless, very limpid oil, with an agreeable odour, approximating to that of oil of pepper. It boils at 417° F. It is isomeric with oil of turpentine. The *heavy oil of partridge-berry*, *gaultheric acid*, or *salicylate of methylene* ($C^2H^3O,C^{14}H^5O^5$), constitutes $\frac{9}{10}$ths of the commercial oil. It is a colourless liquid, having a sp. gr of 1·18 at 50° F., and a warm and aromatic taste. It dissolves in all proportions in alcohol and ether, and slightly so in water. It combines with bases to form salts (*gualtherates*).

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[1] Rafinesque observes that this plant was dedicated to Dr. Gautier, of Canada, by Kalm, wrongly misspelt *Gaultheria* and *Gualtheria*; and that it is a creeping not procumbent: hence he proposed to change the name from Gaultheria procumbens to Gautiera repens.

[2] Mr. Procter, Jun., *Am. Journ. of Pharm.* iii. and xiv.

[3] *Ann. de Chim. et Phys.* 3me sér. t. x. p. 327.

The commercial oil of partridge-berry is an aromatic stimulant, and is chiefly used to cover the unpleasant flavour of other medicines (see *Syrup of Sarsaparilla*, p. 1175). Like other essential oils, it is sometimes employed to allay toothache. In the dose of a fluid-ounce it has caused death: on examination of the body, strong marks of inflammation of the stomach were discovered.[1] The *essence*, prepared by dissolving the oil in rectified spirit, is sometimes employed as a cordial and stimulant.

ORDER LIII. LOBELIACEÆ, *Jussieu.*—LOBELIADS.

CHARACTERS.—*Calyx* 5-lobed, more or less adherent to the ovary. *Corolla* persistent, more or less gamopetalous; *lobes* or petals 5, usually irregular, sometimes almost regular; *tubes* entire or cleft longitudinally. *Æstivation* somewhat valvular. *Stamens* 5, alternate with the lobes of the corolla, usually free, but sometimes adherent to the tube of the corolla; *filaments* free, or more or less connate; *anthers* cohering, bilocular, dehiscing longitudinally; *pollen* ovoid. *Ovary* inferior or semi-superior, 2– or rarely 1-celled, then with parietal placentæ; *style* 1; *stigma* surrounded with a ring of hairs. *Fruit* usually dehiscing at the apex by 2 valves, rarely from above by an operculum, or laterally by 3 valves, or indehiscent. *Seeds* indefinite; *albumen* fleshy; *embryo* straight.—Lactescent *herbs* or *under-shrubs*, rarely small *trees*. *Leaves* alternate, without stipules. *Flowers* usually axillary, solitary, racemose. (Condensed from De Cand.)

PROPERTIES.—Dangerous or suspicious plants; mostly acrids or acro-narcotics.

217. LOBELIA INFLATA, *Linn.*—BLADDER-PODDED LOBELIA; INDIAN TOBACCO.

Sex. Syst. Pentandria, Monogynia.
(Herba florens, *L.*—Herb, *E. D.*)

HISTORY.—This plant was employed by the aborigines in America; and after having been for some time used by quacks, was introduced to the notice of the profession by the Rev. Dr. Cutler, of Massachusetts.[2] It was introduced into England, in 1829, by Dr. Reece.[3]

BOTANY.—**Gen. Char.**—*Calyx* 5-lobed; the tube obconical, ovoid or hemispherical. *Corolla* cleft longitudinally from above, bilabiate; the *tube* cylindrical or funnel-shaped, straight; the *upper lip* usually smaller, and erect; the *lower* generally spreading, broader, 3-cleft, or more rarely 3-toothed. The 2 inferior, or occasionally all of the *anthers*, barbed at the point. *Ovary* inferior or semi-superior, and (in species very much alike) somewhat free (*De Cand.*)

Sp. Char.—*Stem* erect, the lower part simple and shaggy; the upper part ramose and smooth. *Leaves* irregularly serrate-dentate, hairy; the lower ones oblong, obtuse, shortly petioled; the middle ones ovate-acute, sessile. *Flowers* small, racemose. *Pedicels* short, with an acuminate bract. *Calyx* smooth, the *tube* ovoid; the lobes linear-acuminate, equal to the corolla. *Capsule* ovoid, inflated (*De Cand.*)

Annual; height, a foot or more. *Root* fibrous. *Stem* angular. *Leaves* scattered; segments of the *calyx* linear, pointed. *Corolla* delicate

[1] *United States Dispensatory* (*Journ. of Phil. Col. of Pharm.* vi. 290).
[2] Thacker's *Amer. New Dispensatory*, 2d ed. p. 258.
[3] *Pract. Treat. on the Anti-asthmatic Properties of Bladder-podded Lobelia.*

blue. *Anthers* collected into an oblong curved body, purple; *filaments* white. *Style* filiform; *stigma* curved, and inclosed by the anthers. *Capsule* 2-celled, 10-angled, crowned with the calyx. *Seeds* numerous, small (about $\frac{1}{33}$d of an inch long, and $\frac{1}{85}$th of an inch broad), brown, oval or almond-shaped, reticulated with brown fibres, the interspaces irregular in shape, and yellow.

FIG. 3.

HAB.—North America, from Canada to Carolina and the Mississipi. Begins to flower in July. The plant should be collected in August or September.

DESCRIPTION.—Both the flowering herb and seeds are imported from America, and are found in the shops.

1. The *flowering herb* (*herba florens lobeliæ inflatæ*) is chiefly prepared by the Shaking Quakers of New Lebanon, North America. It has been compressed into oblong cakes, weighing either half a pound or a pound each, and enveloped in blue paper.

The packages imported by Mr. M'Culloch, of Covent Garden Market, have a label on them of which the adjoined is a copy.

LOBELIA.
Lobelia inflata.
D. M. & Co.,
WATERVLIET, N. Y.

The dried herb is pale greenish-yellow; its smell is somewhat nauseous and irritating; its taste burning and acrid, very similar to that of tobacco. Its powder (*pulvis lobeliæ*) is greenish, and somewhat resembles powdered senna leaves.

2. The *seeds* (*semina lobeliæ inflatæ*) have been already described. Their powder (*pulvis seminum lobeliæ inflatæ*) is brown, somewhat resembling rappee, but scarcely so uniform in colour, and communicates a greasy stain to paper. When examined by the microscope, this powder is found to consist chiefly of broken seeds, but intermixed with some whole ones.

DESCRIPTION.—This plant was first examined chemically by Dr. Colhoun,[1] and afterwards by Mr. Wm. Procter, Jun.[2] In the second edition of the present work (1842), I published the results of a few experiments made with the view of determining the composition of this plant. A more complete analysis of it was made by Reinsch[3] in 1843. Very recently Mr. Bastick[4] has published some experiments made with the object of isolating the active principle.

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[1] *Journal of the Philadelphia College of Pharmacy*, Jan. 1834; and *Journ. de Pharmacie*, t. xx. p. 545, 1834.
[2] *American Journal of Pharmacy*, vol. ix. p. 98, 1838; and vol. xiii p. 1. Also *Pharmaceut. Journ.* vol. x. pp. 454 and 456.
[3] *Pharmaceutical Journal*, vol. iii. p. 128, 1843.
[4] *Ibid.* vol. x. p. 270, 1850.

Procter's Analysis.	*Pereira's Analysis.*	*Reinsch's Analysis.*	
A peculiar acrid alkaline principle.	Volatile principle.	Water	11·0
Resin.	Lobelina.	Volatile oil	not determined
Chlorophylle.	Lobelic acid.	Alcoholic extract —	
Gum.	Resin.	Chlorophylle	5·5
Gallic [lobelic] acid.	Chlorophylle.	Wax	
Fixed oil.	Gum.	Resin	
Salts of lime.	Extractive.	Stearine	
Salts of potash.	Caoutchouc ?	Peculiar substance (*Lobeliin*)	2·2
Oxide of iron.	Woody fibre.	Aromatic resin	1·3
Lignin.		Vegetable gluten	2·8
		Aqueous extract —	
		Gum	6·0
		Potash, lime, magnesia, iron and manganese salts, with organic and inorganic acids	2·4
		Extracted by potash —	
		Gum	42·4
		Vegetable fibre	26·6
			100·2

1. VOLATILE OIL OF LOBELIA; *Odorous Principle of Lobelia; Lobelianin.*— Water distilled from lobelia has the peculiar smell, and in my former experiments appeared to me to possess also the nauseous, acrid taste, of the plant; but Mr. Procter, Jun. declares it to be devoid of acrimony, and Reinsch states that the oil which comes over on the water has a bland taste and a moderately strong odour. In one experiment I obtained a thin film of what appeared to be a solid volatile oil. The distilled water of lobelia is unaffected by acids, sesquichloride of iron, and tincture of nutgalls.

2. LOBELINA; *Lobeliin; Peculiar Acrid Alkaline Principle.*— The existence of this principle was first announced, though not isolated, by Dr. Colhoun. According to Mr. Procter, it is found in the seeds in larger proportion than in the herb. From twelve ounces of the former he obtained eighteen and a half grains of lobelina. He procured it by treating the seeds with alcohol acidulated with acetic acid until deprived of their acrimony. The tincture was evaporated to the consistence of an extract which was triturated with magnesia and water, and after repeated agitation with water, the liquor which held lobelina in solution was filtered and shaken repeatedly with ether until deprived of acrimony; the ethereal solution was then decanted and allowed to evaporate spontaneously. The impure lobelina thus obtained was dissolved in water by the aid of sulphuric acid, the solution decolorised by animal charcoal, and then mixed with magnesia. The liquor was then agitated with ether to dissolve the lobelina which had been set free, and the ethereal solution allowed to evaporate spontaneously.

Mr. Bastick's process for obtaining it is similar to that recommended by Liebig for procuring hyoscyamia.

Lobelina is a liquid alkaloid, of a light yellow colour and somewhat aromatic odour. It is lighter than water, on which fluid it floats. It is soluble in water, but more so in alcohol and ether. It is also soluble in oil of turpentine and oil of sweet almonds. It has an alkaline reaction on reddened litmus paper, and unites with sulphuric, nitric, hydrochloric, oxalic, and lobelic acids, to form crystallisable salts, which are more soluble in water than the alkaloid itself. Tannic acid throws it down from its solution in the form of a white bitannate. Mr. Bastick says lobelina is volatile, but does not evaporate entirely unchanged. Lobelina is the active principle of the plant, but is not so active as nicotine. A quarter of a grain excited vomiting and much prostration in a cat. A grain caused immediate and total prostration, which for half an hour rendered the animal almost motionless, and caused dilatation of the pupils.

3. LOBELIC ACID.— In 1842 I drew attention to the peculiarity of this acid, to which I gave the name it now bears; and Mr. W. Procter, Jun. has subsequently confirmed my statements. It had previously been confounded with gallic acid. With the persalts of iron a solution of lobelic acid causes an olive-brown precipitate,[1] with sulphate of copper a pale green, with nitrate of silver a brownish precipitate soluble in nitric acid,

[1] The effect produced by persalts of iron on this acid is analogous to that caused by the same agents on aloes (see *ante*, Vol. II. Pt. 1. p. 194) and cebadilla (see *ante*, Vol. II. Pt. 1. p. 175).