Fm. ad nat. del. et pinxt.

GYMNÓCLADUS CANADÉNSIS, Lam.

S. ORD.—CÆSALPINIEÆ.

GENUS.—**GYMNOCLADUS,*** LAM.

SEX. SYST.—DIŒCIA DECANDRIA.

GYMNOCLADUS.

COFFEE TREE.

SYN.—GYMNOCLADUS CANADENSIS, LAM.; GUILANDICA DIOICA, LINN.
COM. NAMES.—KENTUCKY COFFEE TREE, AMERICAN COFFEE BEAN, KENTUCKY MAHOGANY, NICKAR TREE, BONDUE, CHICOT.

A TINCTURE OF THE FRESH FRUIT PULP OF GYMNOCLADUS CANADENSIS, LAM.

Description.—This peculiar tree, when mature, reaches a height of from 50 to 60 feet. *Trunk* erect; *bark* extremely rough, and curiously broken transversely; *branches* few, thornless, when young cane-like, and in winter so destitute of anything looking like a bud that the whole tree appears as if dead. *Leaves* bi-pinnate, 2 to 3 feet long, bearing a pair of opposite leaflets near the base, and from 4 to 7 larger, odd-pinnate accessory leaf-stalks, each of which (upon the younger branches) is composed of from 6 to 8 pairs of leaflets, so that each leaf may bear from forty-eight to one hundred and seventy-four leaflets. These leaves develop late and fall early. *Leaflets* alternate, vertical, ovate-lanceolate, taper-pointed and entire, the lower pair upon the base of the petiole almost cordate, larger and more pointed; *stipules* none. *Inflorescence* terminal compound racemes or thyrsi; *flowers* diœcious, pedicillate; *æstivation* imbricate. *Calyx* elongated-tubular below; *limb* 5-cleft; *lobes* lanceolate, equal. *Corolla* not papilionaceous; *petals* oblong, equal, inserted upon the summit of the calyx-tube. *Stamens* 10, included, inserted with the petals; *filaments* distinct, short, and bearded; *anthers* sagittate, versatile, introrse, 2-celled, opening longitudinally. *Style* single. *Ovules* anatropous. *Fruit* an oblong, flattened pod, 6 to 10 inches long and about 1 inch broad, pulpy inside; *seeds* 2 to 4, flattish, hard, somewhat ovoid, about one-half an inch broad, and of a dark olive color; *embryo* straight.

History and Habitat.—The Kentucky Coffee Tree grows in rich woods, along rivers and lakes, from Western New York and Pennsylvania, to Illinois and south-westward, where it flowers in June.

The previous uses of this plant in medicine are grounded upon its peculiar action on nerve-centres. A decoction of the leaves and fruit pulp has been found useful in locomotor ataxia, reflex troubles incident upon masturbation, laryngeal

* Γυμνός, *gymnos*, naked; κλάδος, *klados*, branch, from the barren and dead appearance of the tree in winter.

coughs dependent upon a chronic irritation of the mucous membranes of the air-passages, puerperal peritonitis, erysipelas, and typhoid forms of fever. To the arts it furnishes a hard wood, something like mahogany, with a fine grain, suitable for cabinet-work; it weighs 40 lbs. 7 oz. per cubic foot, and has a sp. gr. of 647. The seeds are said to have been used by the early settlers of Central United States as a substitute for coffee, and the leaves as a purgative and insecticide. Concerning the use of Gymnocladus as a fly-poison, a Virginia correspondent of *The American Agriculturist* says: "Back of our house here, and overhanging the piazza, is a very large coffee-tree. Though this locality is infested, like Egypt, with a plague of flies, we have never suffered any serious annoyance from them. One year this tree was nearly stripped of its leaves by a cloud of potato-flies (the blistering fly), and we feared that the tree would die from the complete defoliation. In three days the ground beneath was black with a carpet of corpses, and the tree put out new leaves, and still flourishes. For ten years we have used the bruised leaves, sprinkled with molasses water, as a fly-poison. It attracts swarms of the noisome insects, and is sure death to them."

Gymnocladus is officinal in none of the Pharmacopœias.

PART USED AND PREPARATION.—The fresh, green pulp of the unripe seed-pods is to be crushed and prepared as in the preceding drug. The tincture, after filtering from the mass, has a clear orange color by transmitted light; is gummy upon the fingers; and of a familiarly characteristic odor, resembling that of the pulp.

CHEMICAL CONSTITUENTS.—*Cytisine*, $C_{24}H_{27}N_3O$. This alkaloid, found in the seeds of *Cytisus Laburnum*, is said to exist also in the leaves and fruit pulp of this tree. Extracted from Laburnum, it crystallizes in radiate, colorless, deliquescent forms, having a caustic and bitter taste, and an alkaline reaction, neutralizing acids completely. It sublimes without decomposition by the careful application of heat.

PHYSIOLOGICAL ACTION.—Gymnocladus causes vertigo with a sensation of fullness of the head; burning of the eyes; sneezing; salivation; nausea with burning of the stomach; desire to urinate; increased sexual desire; pains in the limbs, numbness of the body, sleepiness, and coldness.

DESCRIPTION OF PLATE 53.

1. End of a sterile branch, Ithaca, N. Y., June 17th, 1885.
2. A small leaf, four times reduced.
3 and 4. Sterile flowers.
5. Sterile flower in section.
6 and 7. Stamens, posterior and lateral views.

(5, 6 and 7 enlarged.)

Fm. ad nat. del. et pinxt.

GÈUM RIVÀLE, Linn.

GENUS.—**GEUM,*** LINN.

SEX. SYST.—ICOSANDRIA POLYGYNIA.

GEUM RIVALE.

WATER AVENS.

SYN.—GEUM RIVALE, LINN.

COM. NAMES.—PURPLE OR WATER AVENS, CHOCOLATE-ROOT; (FR.) BENOITE AQUATIQUE; (GER.) SUMPFNELKENWURZEL.

A TINCTURE OF THE WHOLE PLANT, GEUM RIVALE, LINN.

Description.—This beautiful perennial plant, distinguished on account of its hibiscus-like petals, grows to a height of from one to two feet. *Root* creeping, ligneous, giving off numerous fibrous rootlets. *Stem* simple or nearly so, hairy. *Leaves* of two kinds; those from the root on long deeply grooved petioles, lyrate and irregularly pinnate; those of the stem few, nearly sessile, more or less lyrate below and 3-lobed above, serrate, pointed; *stipules* ovate, incised. *Inflorescence* terminal on long, sometimes branched, peduncles; *flowers* few, large and handsome, nodding on bracted pedicels. *Calyx* erect, concave below, 5-lobed, with 5 alternating bractlets in the sinuses. *Petals* 5, erect, retuse, dilated obovate, contracted into a claw at the base. *Stamens* numerous, inserted into a stipitate disk in the cup of the calyx; *anthers* introrse, opening by a longitudinal slit or pore. *Pistils* many; *ovary* hairy; *styles* long, with flexed tips. *Fruit* a dense, hairy, conical head, situated upon an erect stalk arising from the cup of the calyx; *seeds* oval, bearded, the epicarp retaining the persistent style, which is now hispid below and plumose above the angular flexion of the style.

Rosaceæ.—This grand natural order is represented in North America by 35 genera, 213 species, and 92 varieties, aside from innumerable cultivated specimens. The general characters of the order are: Plants consisting of trees, shrubs and herbs, and furnishing our most valuable fruits. *Leaves* alternate; *stipules* generally present though sometimes early deciduous. *Flowers* regular, handsome. *Calyx* of 5 to 8 sepals united to form the calyx-tube; in some species with a second set as bractlets, outside of, and alternate with, the sepals. *Petals* as many as the sepals, and inserted with the stamens upon a thin disk that lines the calyx-tube. *Stamens* very numerous, perigynous; *filaments* slender. *Pistils* one or many,

* Γευω, *geuo*; a pleasant flavor, one of the species having aromatic roots.

either distinct in or upon a receptacle, or combined in the calyx-tube. *Fruit* either an achenium, a follicle, a drupe, or a pome. *Seeds* single, or a few in each ovary; *albumen* wanting; *cotyledons* large and thick; *embryo* straight. Beside the useful and edible fruits—almonds, peaches, prunes, plums, and cherries (*Amygdaleæ*); crab-apples, apples, quinces, pears, etc. (*Pomeæ*); and strawberries, raspberries, thimble-berries, and blackberries (*Rosaceæ*);—we have many useful medicinal plants among the species in this order. Bitter almonds (*Amygdalus communis, L., 1 var. amara, DC.*); sweet almonds (*Amygdalus communis, L., 2 var. dulcis, DC.*); wild cherry bark (*Prunus Virginiana, Miller*); cherry-laurel (*Prunus Laurocerasus, L.*); kousso (*Brayera anthelmintica, Kunth.*); peaches (*Amygdalus Persica, Prunus Persica*); and the three mentioned in this work. The genera *Potentilla, Spirea,* and *Gillenia,* will in time also be proven to be of benefit in the treatment of disease.

History and Habitat.—This indigenous inhabitant of bogs and springy meadows, grows from the New England States and Pennsylvania westward to Wisconsin and northward, flowering in May. Geum at one time gained great renown as "Indian Chocolate;" it was given in decoction prepared with sugar and milk, for dysentery, chronic diarrhœa, colics, debility, dyspepsia, and most ailments of the digestive tract; it was also used as a styptic in uterine hemorrhage, leucorrhœa, and hemoptysis, and as a febrifuge. (Rafinesque.)

Though Geum has been dismissed from the U. S. Ph., it still retains a place in the Eclectic Materia Medica.

PART USED AND PREPARATION.—The whole plant, gathered before blossoming in the spring, is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-sixth part of it, and the rest of the alcohol added. After having stirred the whole well, pour it into a well-stoppered bottle, and let it stand eight days in a dark, cool place. The tincture, separated by straining and filtering, should have a deep orange-brown color by transmitted light, a slightly astringent taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—An analysis of Avens by Buchner, proves it to be very similar to the European *Geum urbanum;* which, botanically, differs but slightly from the species under consideration. All the qualities of both species are given up freely to both water and alcohol.

Volatile Oil of Geum.—A greenish-yellow, acid, butyraceous oil, having an odor like cloves. This body may be readily obtained by distillation of the roots in water. (Wittstein.)

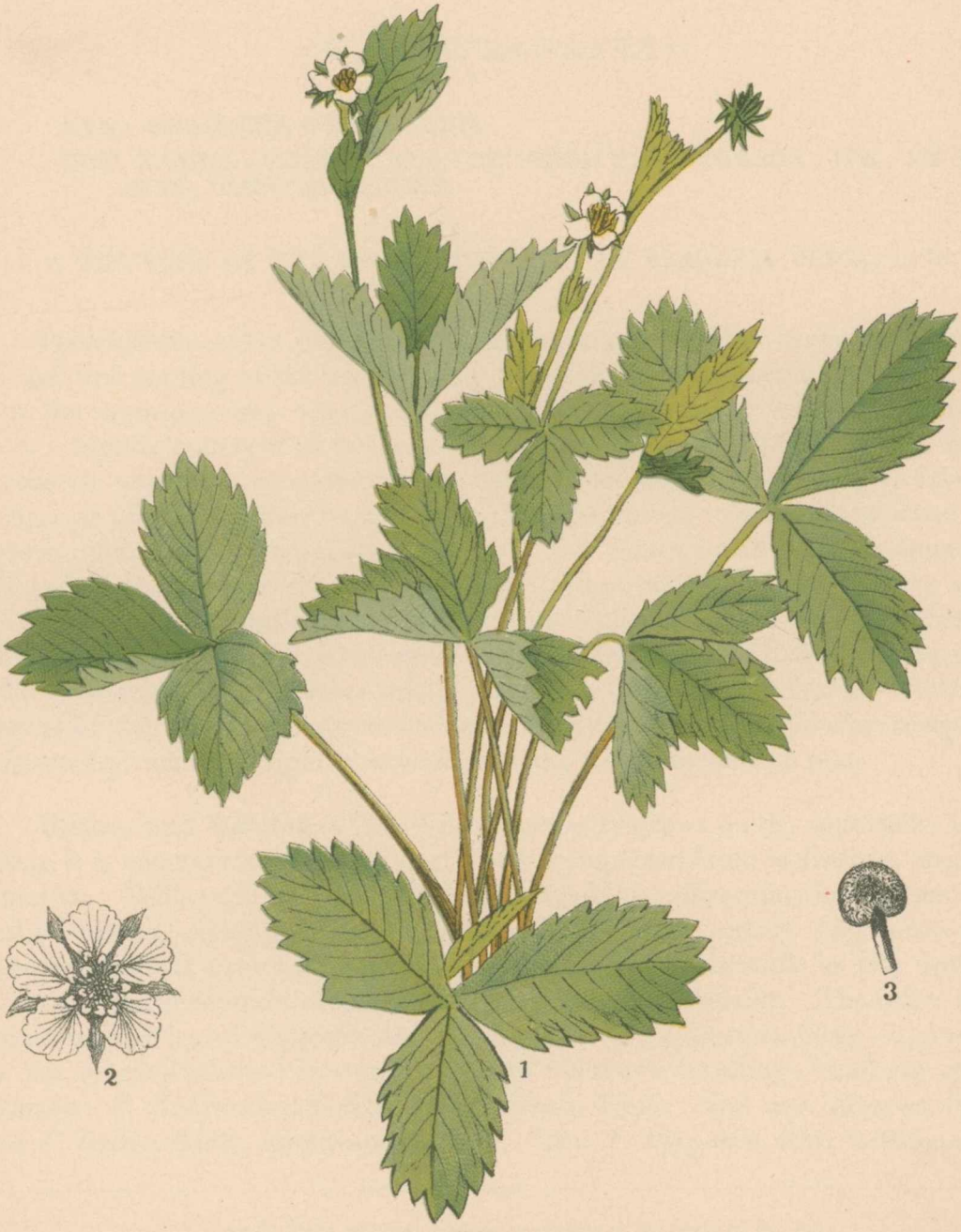
The Water Avens contains also a resin, an acid, bitter extractive, tannin, gum, and other general plant constituents.

PHYSIOLOGICAL ACTION.—The action of this species has not yet been

determined. A short proving by the late Dr. Herring gave as symptoms: severe jerking, tearing pains, like electric shocks, shooting from deep within the abdomen to the end of the urethra, coming on after eating.

DESCRIPTION OF PLATE 54.

1. Part of flowering and fruiting plant, from Lowmansville, N. Y., May 30th, 1884.
2. Root leaf.
3. Sepal, showing bracts.
4. Petal.
5. Stamen (enlarged), outer view.
6. Stamen (enlarged), inner view, with open cell.
7. Achenium (enlarged).



Fm. ad nat. del. et pinxt.

FRAGÀRIA VÉSCA, Linn.

Tribe.—DRYADEÆ.

GENUS.—**FRAGARIA,*** TOURN.

SEX. SYST.—ICOSANDRIA POLYGYNIA.

FRAGARIA.

WILD STRAWBERRY.

SYN.—FRAGARIA VESCA, LINN.

COM. NAMES.—WILD, FIELD,† OR WOOD STRAWBERRY; (FR.) LE FRAISIER; (GER.) ERDBEERE.

A TINCTURE OF THE FRESH RIPE FRUIT OF FRAGARIA VESCA, LINN.

Description.—*Root* perennial, horizontal, knotty; *stolons* creeping along the ground and rooting at the end, sending therefrom young plants, following in due time the same process; *stem* none. *Leaves* mostly radical, ternately compound, hairy; *stipules* adherent to the base of the petioles of the radical leaves; *leaflets* sessile or nearly so, cuneate-obovate, coarsely serrate, and so strongly veined as to appear plicate; *petioles* much longer than the leaves. *Inflorescence* loose leafy cymes, upon long naked scapes; *leaves* of the cymes small; *stipules* lanceolate-oblong, acute; *pedicels* erect or drooping; *flowers* white. *Calyx* concave at the base and furnished with 5 intermediate bracteoles alternate with its lobes; the whole remaining spread or reflexed in fruit; *lobes* acute. *Petals* 5, obtuse, somewhat crenate edged. *Stamens* small, indefinite. *Styles* deeply lateral. *Fruit* consisting of the greatly enlarged and now pulpy and scarlet globular receptacle; *achenia* dry, scattered upon the surface of the fruit, not sunk in pits.

History and Habitat.—The Wild Strawberry grows on dry and rocky banks, where it is common throughout the North Temperate Zone in Europe, Asia, and America. With us it is thoroughly indigenous North, flowering in May and June and fruiting in July and August. This species, together with *F. Virginica*—which is more common, grows in richer soil, and has the achenia sunk in pits upon the surface of the receptacle—form our delicious wild strawberries. The other North American species of Fragaria are *F. Virginica var. Illinœnsis*, Gray, supposed to be the original of the "Boston Pine" and "Hovey's Seedling;" and *var. glauca*, Watson; *F. Californica*, C.&S.; *F. Chilensis*, Duch.; and *var. Scouleri*, Hook; and *F. Indica*, Andr., an adventive form. The *F. Virginica*, Ehr., is supposed to

---

* From the Latin *fragrans*, odorous, on account of the aroma of the fruit.

† More properly applicable to the *F. Virginica*.

be the original of the beautiful scarlet Virginia strawberry. Rafinesque judged that about one hundred varieties existed, but contented himself with naming only seven of F. vesca, of which, however, none are recognized by botanists to-day.

The previous medical uses of Fragaria were few; the berries were ordered to be freely eaten of in various calcareous disorders. Many early writers considered the fruit as beneficial in gouty affections; Linnaeus extols their efficacy in preventing paroxysms of gout in his own case; and Rosseau claims that he was always relieved of a calcareous affliction by eating freely of them. The root in infusion has been used in England for dysuria and gonorrhœa. The dried leaves (Strawberry Tea) yield a slightly astringent infusion used in domestic practice as an excitant, and as an astringent in diarrhœa and dysentery.

PART USED AND PREPARATION.—The fresh, ripe berries, dealt with as in the preceding drug, yield an opaque tincture, having, when in thin layers, a deep brownish-carmine color by transmitted light. This tincture has a very astringent, somewhat vinous taste, the odor of the berries, and a strong acid reaction.

CHEMICAL CONSTITUENTS.—The fruit contains cisso-tanic,* malic, and citric acids; sugar, mucilage, and a peculiar volatile aromatic body uninvestigated.

PHYSIOLOGICAL ACTION.—It is a patent fact that many people with delicate stomach find it almost impossible to eat strawberries and cream—especially early in the season—without suffering from symptoms of disordered digestion; the symptoms often culminating in quite severe attacks. A case in my practice several years ago, while a small-pox scare was prevalent in this city, gave nearly all the symptoms of the toxic effect of the fruit. A young lady, closely veiled, called hastily upon me early one morning, and when seated, withdrew her veil, and in a frightened manner desired to know if she had small-pox. Her face was swollen, bluish-red, and covered with a fine petechial eruption, which she said covered her whole body, but especially her face and trunk. She complained of feeling at times somewhat faint, slightly nauseated, and generally swollen, but especially in the epigastric region and abdomen; her speech was somewhat difficult, and examination showed a swollen tongue. I laughingly ventured asking her—although it was winter—where she had found strawberries, whereupon she asked me, in astonishment, how I knew she had been eating the fruit, adding that a friend in Florida sent her about two quarts, among other fruit, and that she and a lady friend had eaten them all the night before, on retiring. As the symptoms had apparently reached their height, I told her the cause, and advised that she eat nothing for twenty-four hours, giving no remedy, that I might watch the pure symptoms. In the afternoon of the same day the skin was hot and swollen, the patient thirsty and restless, and little sleep was gained that night; the next day the eruption began to fade, the appetite returned, and restlessness ceased. On the third day exfoliation

---

* See under *Ampelopsis quinquefolia*, p. 40-2.

began and was very profuse, the skin appearing quite similar to the condition existing after a severe attack of scarlatina. The young lady who shared her fruit exhibited no symptoms whatever.

DESCRIPTION OF PLATE 55.

1. Whole plant, from Ithaca, N. Y., May 8th, 1880.
2. A flower.
3. Stamen.

(2 and 3 enlarged.)

Fm. ad nat. del. et pinxt.

PIRUS AMERICÀNA, DC.

S. Ord.—POMEÆ.

GENUS.—**PIRUS,*** LINN.

SEX. SYST.—POLYANDRIA TRIGYNIA.

PIRUS.

AMERICAN MOUNTAIN ASH.

SYN.—PIRUS (PYRUS) AMERICANA, D. C.; P. ACUPARIA, MEYER; SORBUS AMERICANA, WILLD.; S. ACUPARIA, VAR. AMERICANA, MICHX.; S. HUMIFUSA, RAF.

COM. NAMES.—AMERICAN MOUNTAIN ASH, AMERICAN SERVICE TREE; (FR.) SORBIS; (GER.) VOGELBEEREN.

A TINCTURE OF THE FRESH BARK OF PIRUS AMERICANA, D. C.

Description.—This nearly smooth tree grows to a height of from 10 to 35 feet. *Bark* somewhat resembling the cherry. *Leaf-buds* pointed, glabrous and glutinous; *leaves* compound, odd-pinnate; *leaflets* 13 to 15, lanceolate, taper-pointed, sharply serrate with pointed teeth, bright and shining green above, not pale below; *teeth* mucronate. *Inflorescence* in large, flattish, compound, terminal cymes. *Calyx* with an urn-shaped tube; *limb* 5-cleft. *Petals* roundish obovate. *Stamens* numerous. *Styles* 3, separate. *Fruit* a bright-scarlet, globose, baccate pome about the size of a pea; *seeds* two in each cell; *testa* cartilaginous.

History and Habitat.—This beautiful mountain tree is indigenous from Maine to Pennsylvania, westward to Michigan, and southward along the Alleghany Mountains. In the north it also habits swampy spots, and flowers in June. The large clusters of brilliant red berries of this species and the *P. acuparia* of Europe, which hang long after the leaves have fallen, make the trees fine lawn ornaments.

The close botanical and chemical relation of the American and European species render them so closely allied that many botanists consider them identical, and the chemistry of the bark, so far as distinguished, is so much like that of the wild cherry (*Cerasus serotina*, D. C.) that its medical uses have been substitutive.

The previous use of the bark in medicine has been as a tonic in fevers of

* The classical name of the Pear tree.

supposed malarial types, where it was often substituted for cinchona. The berries were used as an antiscorbutic.

PART USED AND PREPARATION.—The fresh bark is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. After stirring the whole well, it is poured into a well-stoppered bottle and allowed to stand eight days in a dark, cool place.

The tincture, separated from the above mass by filtration, has a reddish-brown color by transmitted light, a bitter taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—So far as I am able to ascertain, no analysis of the bark of this species has been made to determine its specific principles; a glance, however, at the chemistry of the European species may be of benefit.

Sorbus (Pirus) acuparia.

Amygdalin, $C_{20}H_{27}NO_{11}$.—This glucoside occurs in the bark, buds, flowers and kernels of many rosaceous plants; it separates as pearly scales, which crystallize from water as transparent prisms, having the formula $C_{20}H_{27}NO_{11}(H_2O)_3$. Amygdalin loses its water of crystallization at 120° (248° F.), liquefies at 200° (392° F.), and caramelizes and decomposes at higher temperatures; it is soluble in water and alcohol, but not in ether. Under the action of dilute acids it splits up as follows:

Amygdalin. Water. Hydrocyanic Acid. Benzaldehyde or Oil of Bitter Almonds. Glucose.

$$C_{20}H_{27}NO_{11} + (H_2O)_2 = CNH + C_7H_6O + (C_6H_{12}O_6)_2.$$

Sorbin, $C_6H_{12}O_6$, is the glucose found in the berries; it forms in large, sweet crystals, which melt at 110° (230° F.).

Sorbic and Parasorbic Acid, $C_6H_8O_2$, two isomeric acids of the acrylic group, are also found in the berries of this species.

Citric Acid, $C_6H_8O_7$.—This widely-distributed body occurs, together with malic acid, in the fruits of both species. Citric acid crystallizes in rectorhombic, glassy forms, readily soluble in water, alcohol and ether, and having a pure and pleasant acid taste. These crystals become white when exposed to the air, lose two molecules of water at 100° (212° F.), fuse at 150° (302° F.), and decompose with a specific empyreumatic odor at higher temperatures.

Malic Acid, $C_4H_6O_5$.—This acid is found in the berries as they begin to ripen. It is obtained from its aqueous solution in small, colorless, deliquescent prisms, having a strong but pleasant acid taste.

PHYSIOLOGICAL ACTION.—The tincture produced, in Dr. Gatchell and others under his observation,* a set of symptoms showing an irritation of the

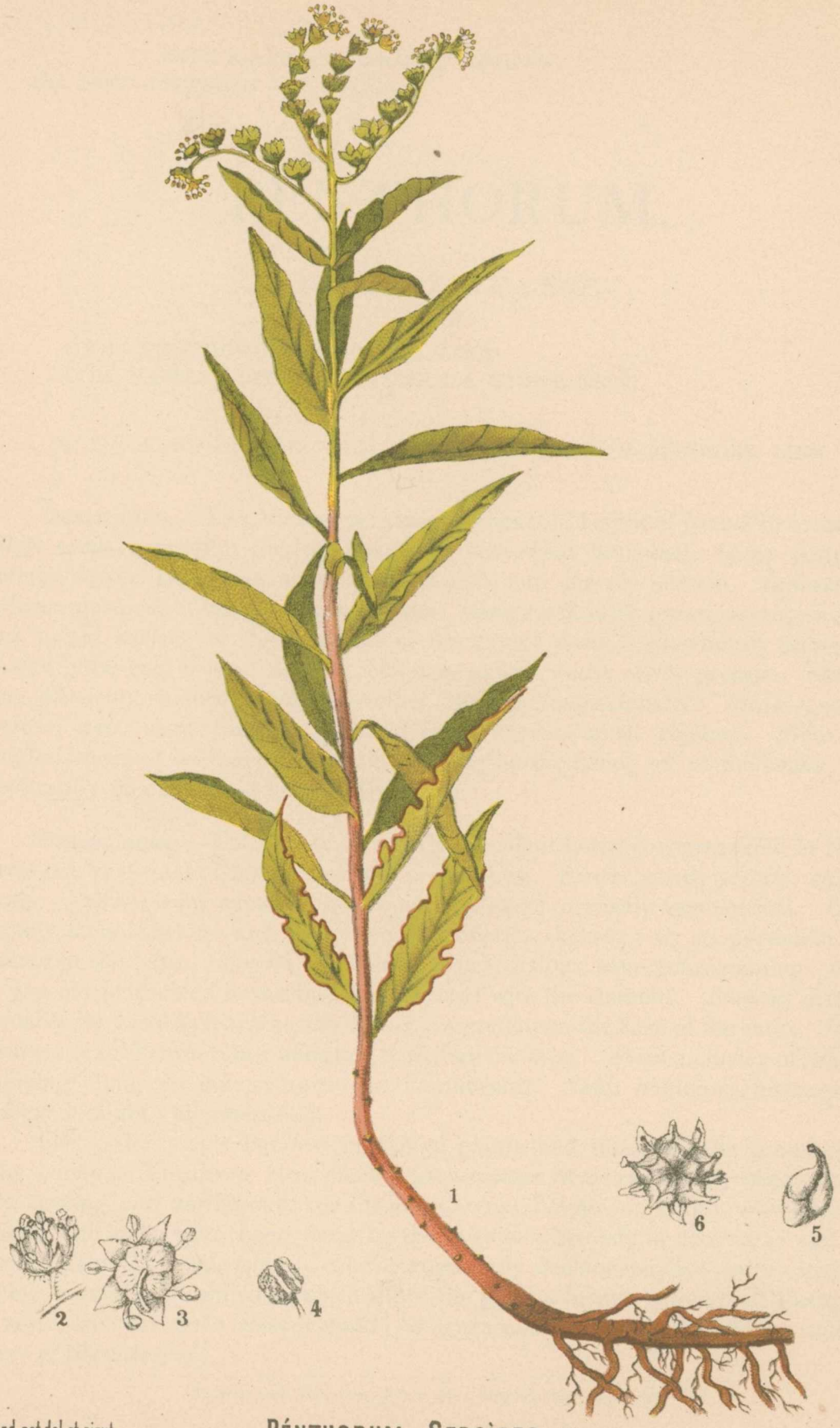
* *Am. Hom. Obs.*, 1878, p. 520.

alimentary mucous membranes, and reflex nervous irritation. It also caused arthritic disturbances and symptoms of chill, heat, and perspiration.

Description of Plate 56.

1. A portion of a cyme, Binghamton, May 28th, 1885.
2. A flower, showing perianth.
3. A pistil.
4. Stamens.
5. Two leaflets.
6. A branch in fruit.
7. Section of fruit.

(3, 4 and 7 enlarged.)



Fm. ad nat del. et pinxt.

PÉNTHORUM SEDOÏDES, Linn.

GENUS.—**PENTHORUM,*** GRONOV.

SEX. SYST.—DECANDRIA PENTAGYNIA.

PENTHORUM.

DITCH STONE CROP.

SYN.—PENTHORUM SEDOIDES, LINN.
COM. NAMES.—DITCH OR VIRGINIA STONE CROP.

A TINCTURE OF THE WHOLE PLANT PENTHORUM SEDOIDES, LINN.

Description.—This homely perennial grows to a height of from 8 to 12 inches. *Stem* erect, somewhat angled, simple or somewhat branched; *leaves* scattered, nearly sessile, lanceolate, acute at both ends, and sharply serrate. *Inflorescence* a loose terminal cyme of revolute spikes; *flowers* yellowish-green, arranged along the upper surface of the branches of the cyme; *pedicels* glandularly pubescent. *Calyx* pubescent below; *sepals* 5, cuneate, acute. *Petals* rarely present. *Stamens* 10; *filaments* smooth; *anthers* 2-celled, opening longitudinally. *Pistils* 5, united below; *styles* short, forming beaks in fruit; *stigmas* small, capitate. *Fruit* a 5-angled, -horned, and -celled capsule, opening by the falling off of the beaks; *carpels* many seeded; *seeds* ellipitical, pointed.

Crassulaceæ.—This family of mostly succulent herbs is represented in North America by 6 genera, 47 species, and 2 varieties. *Leaves* mostly sessile; *stipules* none. *Inflorescence* cymose or racemose; *flowers* perfectly symmetrical. *Calyx* mostly monosepalous and free from the ovaries; *sepals* 3 to 20, persistent, and united at the base. *Corolla* sometimes monopetalous, sometimes wanting; *petals* if present imbricated in the bud and inserted with the stamens. *Stamens* distinct, equal to, or twice as many as, the sepals, inserted upon the base of the calyx. *Pistils* distinct (exc. Penthorum), minutely scaled at the base. *Fruit* a cluster of follicles opening along the inner suture (exc. Penthorum). *Seeds* numerous, anatropous; *embryo* straight; albumen thin.

This order yields but few medicinal plants, and those of little prominence. The common European Houseleek (*Sempervivum tectorum*, Linn.), whose leaves are cooling and astringent; the Orpine (*Sedum Telephium*, Linn.), whose leaves, boiled with milk, have been used by the laity as a remedy in diarrhœa; and the Stone Crop (*S. acre*, Linn.)—whose apparently dechlorophylled leaves make a fitting cover for the old ruins which afford the plant a habitat throughout Europe—is acrid, and has been recommended in cancerous troubles and epilepsy.—(*Doctrine of Signatures?*)

* Πέντε, *pente*, five; ὄρος, *oros*, a rule; from the floral symmetry.

History and Habitat.—Penthorum is an indigenous ditch-weed, common in all localities in the United States, where it flowers from June to September.

It has always held a place in domestic practice as an astringent in diarrhœa and dysentery. Drs. Briggs* and Scudder brought it to the notice of practitioners as a remedy, both topic and internal, for irritation of the mucous membranes and various forms of subacute inflammation of the same, as in pharyngitis, vaginitis, tonsillitis, etc.

PART USED AND PREPARATION.—The whole fresh plant is to be chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-sixth part of it, and the rest of the alcohol added. After stirring the whole well, pour it into a well-stoppered bottle, and allow it to stand eight days in a dark, cool place, shaking often.

The tincture, separated from this mass by filtration, has a brilliant reddish-orange color by transmitted light; no special odor; an astringent taste; and an acid reaction.

CHEMICAL CONSTITUENTS.—An analysis by the Lloyd brothers failed to yield a peculiar principle, or even a volatile oil. A peculiar tannin was, however, determined, which first turns blue then precipitates black from its alcoholic solution with ferrous, and deep green with ferric sulphate.

PHYSIOLOGICAL ACTION.—Penthorum, according to Dr. Morrow's experiments, causes many symptoms simulating a coryza: rawness of throat and tongue; increased appetite followed by nausea; burning in the rectum; loose stools followed by constipation; increased urine; cough, and constriction of the chest.

DESCRIPTION OF PLATE 57.

1. Whole plant, Binghamton, N. Y., July 30th, 1885.
2. Flower.
3. View of calyx.
4. Anther.
5. Carpel.
6. Fruit.

(2–6 enlarged.)

---

* *Ec. Med. Jour.*, 1875, 479.

Ɇ.m ad nat del. et pinxt.

HAMAMÈLIS VIRGÍNICA, Linn.

Tribe.—HAMAMELEÆ.

GENUS.—**HAMAMELIS,*** LINN.

SEX. SYST.—TETRANDRIA DIGYNIA.

HAMAMELIS.

WITCH HAZEL.

SYN.—HAMAMELIS VIRGINICA, LINN., HAMAMELIS MACROPHYLLA, PURSH, HAMAMELIS DIOICA, WALT., HAMAMELIS CORYLIFOLIA, MŒNCH.

COM. NAMES.—WITCH HAZEL, SNAPPING-HAZELNUT, WATER-SEEKER, WINTER-BLOOM, SPOTTED ALDER.

A TINCTURE OF THE FRESH TWIGS AND BARK OF HAMAMELIS VIRGINICA, LINN.

Description.—This strange shrub, whose flowers do not open until its leaves fall, grows to a height of from 5 to 15 feet. The *stem* is usually single, sometimes as large as 4 inches in diameter at the base. *Bark* smooth, brown. *Branches* numerous, long, flexuous and forking. *Leaves* 3 to 5 inches long, cordate-ovate or oval, with sinuate edges and straight veins, downy stellate-pubescent when young, but becoming smooth with age. *Petioles* about one-half an inch long. *Involucre* 3-leaved, scale-like, pubescent, on a short peduncle. *Flowers* many, axillary, several in a cluster or head. *Calyx* persistent, of 4 broadly-ovate, hairy, recurved divisions, with 2 or 3 little bracts at the base. *Corolla* of 4 long, strap-shaped, yellow petals, which soon wither and curl. *Stamens* 8, four are fertile, four sterile; *sterile stamens* scale-like, truncate, opposite the petals; *fertile stamens* shorter, curving inward toward the pistil; *filaments* short; *anther* adnate, introrse, 2-celled, the cells rather widely separated, opening laterally by uplifted valves. *Pollen*, grains ellipsoid, with 3 evenly separated deep sulci. *Ovaries* 2, united below, *Styles* 2, short. *Capsule* roundish ovoid, hard and leathery, the lower half with the persistent calyx and bracts, the upper smooth. *Dehiscence* loculicidal from the apex, during which the exocarp cleaves from the endocarp, which contains the seeds, and soon bursts, disclosing 2 cells, black and shining within, each with a single seed. *Nutlets* stony, oblong, narrow, deep glossy black, except the dull white tip. *Embryo* long, straight. *Albumen* little or none.

History and Habitat.—This plant, about which was formerly draped, by those versed in the occult arts, a veil of deep mystery, and whose forked branches were used as a divining-rod while searching for water and ores, grows profusely in the damp woods of Canada and the United States, flowering in October and ripening its fruit in the following summer.

---

* ἅμα, *like to*, μηλίς, *an apple tree.* Some plants bear a slight resemblance to small wild apple trees.

The many varied uses of a watery infusion of Witch-hazel bark were fully known to the aborigines, whose knowledge of our medicinal flora has been strangely correct as since proven. Its use in hæmorrhages, congestions, inflammations and hæmorrhoids is now generally known through the medium of an aqueous distillate of the bark.

The U. S. Ph. (1882) has wisely added Hamamelis to their medicaments, officinal as *Extractum Hamamelidis Fluidum.* In the Eclectic Materia Medica the officinal preparation is *Decoctum Hamamelis.*

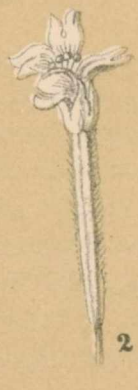
PART USED AND PREPARATION.—The bark of the young twigs and roots is chopped and pounded to a pulp and weighed, then two parts by weight of alcohol are taken, the pulp mixed with one-sixth part of it, and the rest of the alcohol added; after having stirred the whole well, pour it into a well-stoppered bottle, and let it stand eight days in a dark, cool place. The tincture, separated by decanting, straining and filtering is by transmitted light of a deep yellowish-brown color. It has a sweetish, slightly astringent taste, an acid reaction, and a peculiar odor, which, once noticed, will always distinguish it.

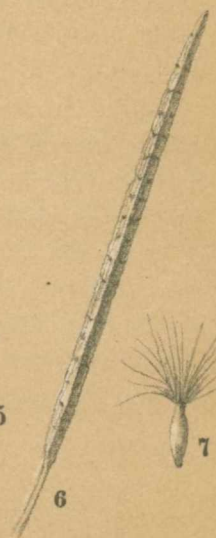
CHEMICAL CONSTITUENTS.—No analysis of this plant has been made to determine its principles except as far as tannin is concerned; this body was found in small percentage. Water seems, nevertheless, to extract all or nearly all of its virtues. The active body, however, must be more or less volatile, as preparations of the plant, made without using proper care in regard to this feature, have not the action usually sought for. It is also a fact that the bark of the root alone is not sufficiently medicinal, and that the curative property of the tincture does not lie entirely in the tannin.

PHYSIOLOGICAL ACTION.—Hamamelis, according to Dr. H. C. Preston, who first attempted the study of its action, causes a determination of venous blood to the head, chest, abdomen and pelvis. Its action would seem to be, not upon the circulation itself, but upon the coats of the veins, causing a relaxation, with consequent engorgement and exosmosis, this action in many cases proceeding to actual rupture of the vessels. The symptoms pointing to the above conclusion are produced as follows: Vertigo, venous epistaxis, preceded by severe pressure both in the os frontis and superior nares, relieved by the hæmorrhage; nausea and vomiting, pain and tenderness of the abdomen, with flatulence and diarrhœic passages from the bowels; pulsations in the rectum synchronous with the pulse; much lumbar pain, with weakness of the lower limbs and general lassitude. The action of hamamelis upon the heart and circulation in general is not marked in these experiments.

DESCRIPTION OF PLATE 58.

1. End of flowering branch, Binghamton, N. Y., October 23d, 1881.
2. Leaves added in June.
3. Flower (enlarged), the petals broken off.
4. Fruit.
5. Pollen grains, side and end view, x 380.
6. Nutlet.





Fm. ad nat. del. et pinxt. EPILÒBIUM PALÚSTRE, var. LINEÀRE, Gray.

GENUS.—**EPILOBIUM,*** LINN.

SEX. SYST.—OCTANDRIA MONOGYNIA.

EPILOBIUM.

WILLOW-HERB.

SYN.—EPILOBIUM PALUSTRE, VAR. LINEARE, GRAY; E. PALUSTRE, GRAY; E. ROSMARINIFOLIUM, PURSH.; E. LINEARE, MUHL.; E. PALUSTRE, VAR. ALBESCENS, RICH.; E. PALUSTRE, VAR. ALBIFLORUM, LEHM.; E. OLIGANTHUM, MICHX., F.; E. TENELLUM DENSUM, LEPTOPHYLLUM, AND CILIATUM, RAF.; E. ANGUSTISSIMUM, WILLD. (GREENLAND); E. PUBESCENS, PRESL.; E. SQUAMATUM, NUTT.

COM. NAMES.—SWAMP WILLOW-HERB, NARROW-LEAVED WILLOW-HERB, MARSH EPILOBIUM, SWAMP WILLOW, WICKOP; (FR.) HERBE DE ST. ANTOINE; (GER.) ANTONSKRAUT.

A TINCTURE OF THE WHOLE PLANT EPILOBIUM PALUSTRE, VAR. LINEARE, GRAY.

Description.—This slender, perennial herb usually attains a growth of from 6 inches to 2 feet. *Stem* erect, roundish, terete, minutely hoary, pubescent, and branchy above. *Leaves* nearly sessile, narrowly lanceolate or linear, acute, attenuate at the base, and with more or less revolute margins; the upper alternate; the lower opposite, entire, or denticulate. *Inflorescence* in a terminal corymb; *flower-buds* nodding; *flowers* minute, rose-colored. *Calyx-tube* not prolonged beyond the ovary; *limb* 4-cleft, deciduous. *Petals* 4, erect, mostly notched at the end, and about twice the length of the calyx. *Stamens* 8, erect; *anthers* short. *Style* erect, included; *stigma* clavate, nearly entire. *Fruit* an elongated, linear, hoary, somewhat quadrangular, loculicidal pod; *seeds* numerous, bearing a tuft of long hairs upon the apex.

Onagraceæ.—This innocent order of mostly perennial herbs, represented in North America by 15 genera, 155 species, and numerous varieties, is characterized as follows: *Flowers* 4-merous (sometimes 2, 3, 5, or 6-merous), perfect, and symmetrical. *Calyx* with its tube adhering to the ovary; *lobes* valvate in the bud or obsolete. *Petals* convolute in the bud, sometimes absent. *Stamens* as many, or twice as many, as the petals or calyx-lobes; *filaments* inserted at the summit of the calyx-tube; *pollen* with its grains often connected by cobwebby threads. *Style* single, slender; *stigma* 2- to 4-lobed or capitate. *Fruit* capsular or baccate; *seeds* small, anatropous; *albumen* wanting.

---

* Ἐπί, *epi*, upon; λόβος, *lobos*, a pod; as the flowers seem to be.

History and Habitat.—The Swamp Willow-Herb is indigenous to North America, where it extends from the mountains of North Carolina, and from Southern Illinois, northward to the Arctic Circle. It habits high sphagnum swamps, and flowers in July and August.

Epilobium has proven itself a mild tonic and astringent, quite useful in slight types of diarrhœa and dysentery attended with colic, cramps in the stomach, and light typhoid abdominal symptoms. In irritation of the intestinal canal, followed by diarrhœa and some tympanitis, it has often proved quite beneficial in the hands of our Eclectic physicians.

PART USED AND PREPARATION.—The whole fresh plant, while in flower, should be chopped and pounded to a pulp and weighed; then two parts by weight of alcohol taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. Pour the whole into a well-stoppered bottle, and allow it to stand eight days in a dark, cool place, shaking twice a day. The tincture, prepared from this mass by decanting, pressing, and filtering, should have a light yellowish-brown color by transmitted light; a smooth, then astringent taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—No analysis of this plant has so far been made. It contains, however, tannin and gallic acid, beside the usual plant constituents.

PHYSIOLOGICAL ACTION.—The experiments of Dr. Wright, who took from one-half to one ounce of the tincture, caused some symptoms that must have been due to so large a "drink." Outside of the symptoms that we are prone to lay to the alcohol, the following also occurred: Salivation; loose stools; red urine; and chills, followed by feverishness and general aching throughout the body.

A proving with the tincture prepared as here directed, should be made.

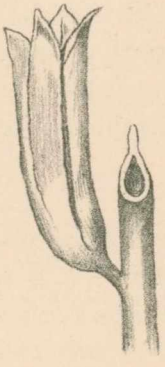
DESCRIPTION OF PLATE 59.

1. A small plant from Appalachin, N. Y., July 26th, 1886.
2. A flower.
3. Petal.
4. Stamens.
5. Pistil.
6. Pod.
7. Seed.

(2–5 and 7 enlarged.)

1

2



3

Ɇ.m. ad nat del. et pinxt.

ŒNOTHÈRA BIÉNNIS Linn.

GENUS.—**ŒNOTHERA,*** LINN.

SEX. SYST.—OCTANDRIA MONOGYNIA.

OENOTHERA.

EVENING PRIMROSE.

SYN.—ŒNOTHERA BIENNIS, LINN.; ŒNOTHERA PARVIFLORA, LINN.; ŒNOTHERA GAUROIDES, HORNEM; ONAGRA BIENNIS, SCOP.; ONAGRA VULGARIS, AND CHRYSANTHA, SPACH.

COM. NAMES.—COMMON EVENING PRIMROSE, NIGHT WILLOW-HERB, SCABBISH, TREE PRIMROSE, CURE-ALL; (FR.) ONAGRE; (GER.) NACHTKERZ.

A TINCTURE OF THE WHOLE, FRESH, NEWLY BLOSSOMING PLANT, ŒNOTHERA BIENNIS, LINN.

Description.—This nocturnal annual, or biennial plant, attains a growth of from 2 to 4 feet. *Root* conical; *bark* thin, yellowish, or brownish. The roots of the first year are fleshy and succulent, in the second they become fibrous and woody. *Leaves* alternate, 2–6 inches long, ovate-lanceolate, acute, very minutely toothed, and pubescent; the cauline sessile, those near the root contracted into a petiole. *Inflorescence* a terminal, foliaceous spike, lengthening greatly as the flowers develop and the fruit matures; *flowers* odorous, light-yellow, ephemeral. *Calyx-tube* cylindrical, caducous, prolonged quite a distance beyond the ovary, being more than twice as long as its lobes; *limb* of 4 long, reflexed lobes. *Petals* 4, obcordate, not clawed, withering and becoming orange-brown after a night's expansion. *Stamens* 8, nearly equal, shorter than, and both opposite and alternate with, the petals; *filaments* slender, sometimes curved; *anthers* linear, versatile. *Ovary* ovate; *style* terminal, long, cylindrical, exserted; *stigmas* a group of 4 linear, diverging lobes. *Fruit* a 4-valved, many-seeded follicle; *follicle* oblong, sessile, tapering above; *seeds* naked. Read description of the order under Epilobium palustre, 59.

History and Habitat.—The Evening Primrose is common in the United States, growing in fields and waste places generally, and flowering from July to September. It varies greatly in its growth, affording at least 5 distinct varieties, *viz.*, *var. α grandiflora*, a large-flowered form; *var. β muricata*, with rough, bristly stem and pods; *var. γ canescens; var. δ hirsutissima*, a particularly hairy form;

---

* Theophrastus describes a plant whose dried root caught the odor of wine. Hence he called it οἶνος, *oinos*, wine; θήρα, *thera*, catch. (Barton.) Or taking θήγα to mean a hunt or chase, it is alleged that the meaning is applicable to the belief that it was the root of this plant, or one of its botanical relatives, that was eaten to provoke an appetite for wine.

This genus is a large and varied one, containing 57 species, and 33 varieties, in North America alone.

and *var.* ε *cruciata*, having small, linear petals, shorter than the stamens. The flowers open fully, after sundown, and remain so until the sun is well up in the morning, then wither and fall. Much has been written concerning the property inherent in the petals of many species of this genus, of emitting a "phosphorescence" at night, the flowers being distinguishable at a goodly distance beyond non-refractory objects by their whitish luminosity. In regard to this phosphorescence a word or two is in place. That the petals do emit light on a dark night is not fanciful; still it is not due to a property of giving out spontaneous light (phosphorescence), but to a process of storing up sunlight during the day, and retaining it at night—a property identical with that exhibited by *hepar sulphuris calcarea*, and the sulphides of barium and strontium.*

The young roots of the evening primrose are said to be edible and pleasant, either pickled or boiled, having "a nutty taste, quite similar to that of rampion (*Campanula rapunculus*), and are used in Germany and some parts of France, either stewed or raw, in salads, like celery." (Porcher.) Lindley states, that the young mucilaginous twigs are used in the same way.

About the only previous use of this plant in medicine was a strong decoction of the dried herb as an external application in infantile eruptions, and as a general vulnerary. Dr. Winterburn† states it to be a curative in spasmodic asthma, pertussis, gastric irritation, irritable bladder, and chronic exhaustive diarrhœas.

PART USED AND PREPARATION.—The whole fresh plant, as it is coming into bloom, is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-sixth part of it, and the rest of the alcohol added. After having stirred the whole, it is poured into a well-stoppered bottle, and allowed to stand eight days in a dark, cool place.

The tincture, obtained from this mass by filtration, should have a clear reddish-orange color by transmitted light, an odor similar to that of wet hay, a taste at first mucilaginous, then astringent and bitter, and an acid reaction.

CHEMICAL CONSTITUENTS.—*Œnotherin.* This body, claimed as a principle by Chicoisneau, is evidently an extract, which probably contains all of the principles of the plant except the acrid body, which is dissipated by heat. It has not yet been analyzed, but would doubtless show a resin, a bitter principle, and a special acid. Mucilage is present in large percentage.

Potassium nitrate, $K N O_3$.—Crystals of this salt are readily extracted from an alcoholic tincture of the root.‡

PHYSIOLOGICAL ACTION.—The brain symptoms following a dose of 60 drops of the fluid extract of Œnothera in a woman of 40, as chronicled by Dr. Nute,§ are very interesting, and should stimulate a desire for a fuller proving.

* Calcined oyster shells emit stored sunlight, on account of the sulphide of calcium in their composition. This fact is largely utilized in the manufacture of luminous clock-faces, match-safes, door-plates, and the like. These objects, when placed in the sunlight during the day, are visible at night.

† "The Evening Primrose," a paper read before the *Ills. State Hom. Soc'y. Am. Homœopath*, 1883, p. 317.

‡ Claussen, *Am. Jour. Phar.*, 1884, p. 365.

§ *U. S. Med. and Surg. Journ.*, vol. ix, p. 395.

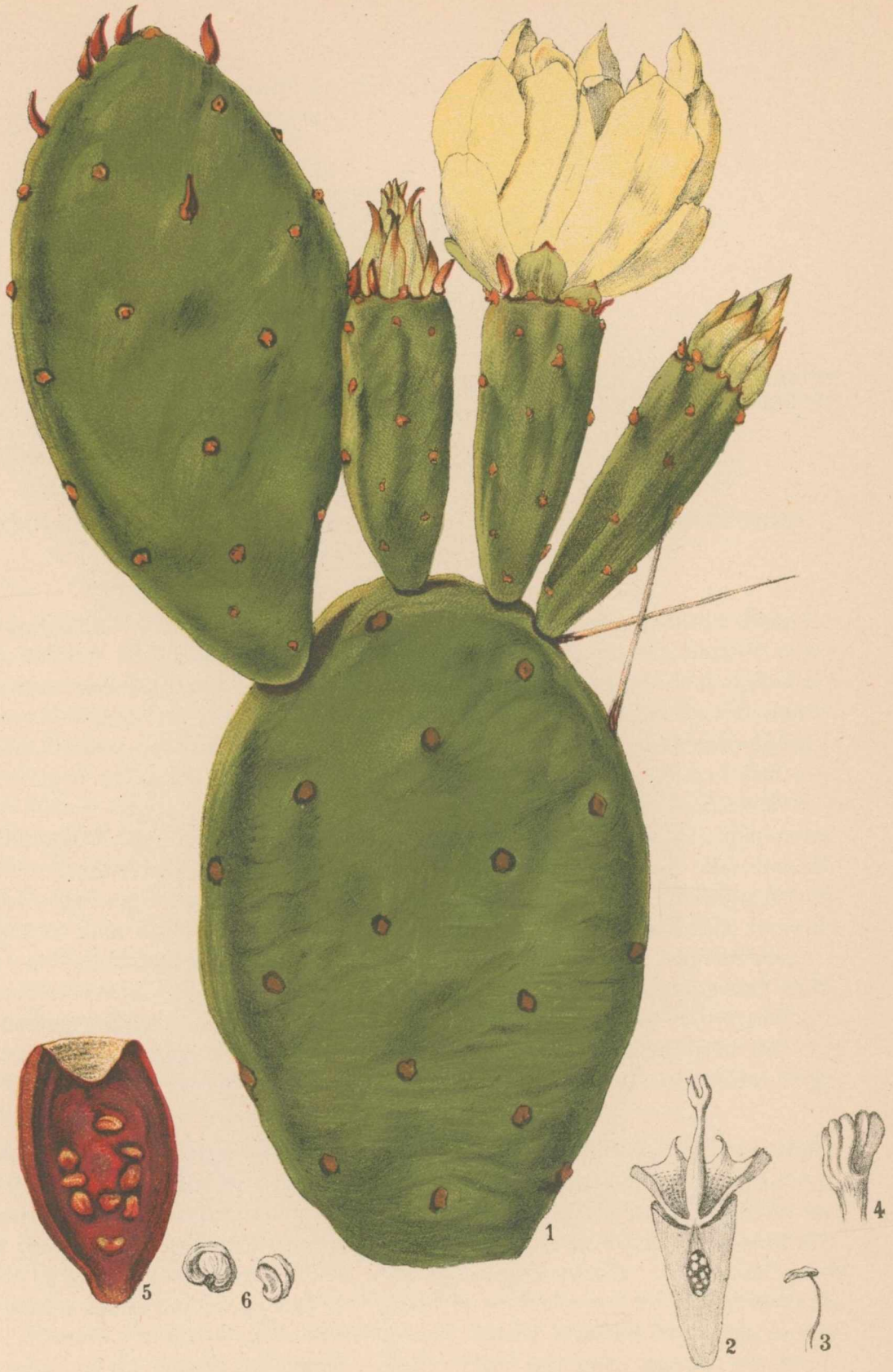
This individual experienced extreme vertigo, inability to sit or stand erect, semi-unconsciousness, loss of muscular power, numbness and peripheral prickling, rigors, occasional muscular cramps in the abdomen and extremities, and great exhaustion. These symptoms were followed by a free movement of the bowels, and a copious discharge of urine. Dr. Winterburn* judges that the drug has a special action upon the pneumogastric nerve, and, reflexly, an irritative action upon its pulmonary and laryngeal branches.

DESCRIPTION OF PLATE 60.

1. Top of flowering plant; Chemung, N. Y., Sept. 4th, 1879.
2. Pistil.
3. Fruit.

---

* *U. S. Med. and Surg. Journ.*, vol. ix, p. 395.



Ĕ.m. ad nat del. et pinxt.

OPÚNTIA VULGÀRIS, Mill.

GENUS.—**OPUNTIA,*** TOURN.

SEX. SYST.—ICOSANDRIA MONOGYNIA.

OPUNTIA.

PRICKLY PEAR.

SYN.—OPUNTIA VULGARIS, MILL.; O. ITALICA, TEN.; O. HUMIFUSUS, AND O. MARITIMA AND HUMIFUSA, RAF.; O. INTERMEDIA, SALM.; CACTUS OPUNTIA, LINN.

COM. NAMES.—PRICKLY PEAR, INDIAN FIG.

A TINCTURE OF THE FRESH FLOWERS AND GREEN OVARIES OF OPUNTIA VULGARIS, LINN.

Description.—This curious, low, pale, prostrate, spreading plant is characterized as follows: *Branches* (?) more or less assurgent; *joints* flat, broadly ovate, the younger ones leafy, the older prickly; *leaves* minute ovate-subulate, appressed, deciduous, arranged spirally about the joints; *axils* more or less bristly with numerous short, barbed prickles; *spines* rarely present, when found they are whitish in the north and yellowish southward, and vary from two-thirds to one and one-quarter inches long. *Inflorescence* consisting of a few sessile, solitary flowers along the apical ridge of the joints; *flowers* large, sulphur-yellow, not ephemeral; *perianth* not united into a prolonged tube, but regular and spreading. *Sepals* ovate-lanceolate, tapering to a point. *Petals* ample, the inner roundish. *Stamens* numerous, shorter than the larger petal; *filaments* glabrous; *anthers* linear, versatile. *Ovary* 1-celled, obovate; *style* cylindrical, narrowed at the base; *stigmas* about 6, in two sets, clavate. *Fruit* an obovoid, nearly smooth, crimson, pulpy and edible berry, having a deep depression at the apex showing the scars of the perianth. *Seeds* numerous, flattish-reniform, with a rounded ridge extending over the arch opposite the hilum; *embryo* curved around the thin albumen; *cotyledons* large, becoming foliaceous.

Cactaceæ.—This large and peculiar family of thick and fleshy plants is represented in North America by 5 genera, containing in all 142 species and 39 recognized varieties. Its characteristics are as follows: *Stems* globular or columnar and angled, composed of numerous compressed joints. *Leaves* usually absent or represented by spines, thorns or bristles. *Flowers* solitary, sessile. *Sepals* and *petals* similar and evolute, numerous and imbricated in several rows, all adherent to the ovary. *Stamens* numerous; *filaments* long and slender, inserted into a ring formed by the union of the sepals and petals. *Styles* united into one; *stigmas* numerous. *Fruit* a berry; *seeds* numerous, campylotropous, finally becoming separate from the placentæ and loose in the pulp; *placentæ* several, parietal; *albumen* scanty.

* A Theophrastian name for some species growing in the country of the Opuntiani, whose chief city was Opus, near Phocis.

The proven plants of this order are: the Jamaican *Cactus grandiflorus*, Linn.; the beautiful Night-blooming Cereus, whose ephemeral flowers are remarkable for their exceeding size and fragrance; *Cereus Bonplandii*, Parm.; and *C. serpentinus*, Haw. No other species are used in medicine, though many furnish both food and drink to those compelled to pass over the barren wastes which this order mostly habits, the pulpy fruits and succulent joints, deprived of their coat of mail, being acid and aqueous to a high degree. Mr. J. R. Dodge* speaks as follows of the species used by the American Aborigines:

"*Echinocactus Wislizeni.*—A section of the stem is often employed as a cooking vessel. The seeds are small and black, but, when parched and pulverized, make good gruel and even bread. The pulp of the fruit is rather sour, and not much eaten. Travellers in passing through the cactus wastes often resort to this plant to quench their thirst, its interior containing a soft, white, watery substance, of slightly acid taste, which is rather pleasant when chewed. It is a common sight to see on each side of the road these plants with a large perforation made by the thirsty traveller. An Indian, when travelling, and wishing to make a meal, selects a large plant, three feet or more long and two in diameter, cuts it down and hollows it out so as to form a trough; into this he throws the soft portions of the pulpy substance which surrounds the central woody axis, and adds meat, roots, seeds, meal, fruits, or any edible thing on hand; water is added, and the whole mixed together; stones are then highly heated and dropped into the mixture, and, as they cool, are taken out, licked clean, reheated, and returned to the cooking vessel, until the mixture is thoroughly boiled. This is a favorite dish with the Yabapais and Apaches of Arizona. The Papajo Indians pare off the rind and thorns of large plants of this species of cactus, letting it remain several days to bleed, when the pulp is pared down to the woody axis, cut up into suitable pieces, and boiled in syrup of the *Cereus giganteus* or *Cereus Thurberi*. If a kind of sugar which is made by the Mexicans is attainable, it is employed instead of the syrup, thus forming a good preserve. These pieces, when taken out of the liquid and dried, are as good as candied citron, which they much resemble in taste and substance.

"*Prickly pear* (*Opuntia Engelmani, O. vulgaris, O. Camanchica, O. Rafinesquii, O. occidentalis*).—The fruit of these species of cactus is much eaten by all the Indians of New Mexico, Arizona, California and Utah, under the common Spanish name of *tunas*, great quantities being dried for use in the winter. These plants grow in arid desert localities which produce nothing better; they are large and of a bright red to purple color; of a rather pleasant, sweet, somewhat acid taste, and have thin skins and rather large seeds, which are discarded. The skin is studded with bunches of very fine downy spines, which the Indians brush off with a bunch of grass. The Apaches use wooden tongs to gather the fruit, to prevent being scratched by these spines or the thorns of the plant. The Pawnees and Papajoes dry the unripe fruit of the *Opuntia* for future use, to be cooked with meat and other substances. The fresh unripe fruit is often boiled in water from ten to twelve hours, until soft, when it becomes like apple-sauce; then, being allowed to ferment a little, it becomes stimulating and nutritious. Some Indians roast the leaves of the *Opuntia* in hot ashes, and, when cooked, the outer skin,

* *U. S. Agric. Repts.*, 1870, 417–418.

with the thorns, is easily removed, leaving a slimy, sweet, succulent substance, which is eaten. Hunger and destitution frequently compel Indians and white men to live for many days on this food. A yellowish white gum often oozes out of the leaves of the *Opuntia*, which is also eaten."

History and Habitat.—This species is indigenous to the sandy fields of the Atlantic and Pacific seaboards, as well as the arid lands of the southwestern portion of North America; it is also found in Europe. It habits rocky places and dry sands, where it flowers in June and July at the north.

The fruit is edible and at the same time a pleasant diuretic, though it renders the urine a bloody tinge; the taste is acid and cool, much resembling the Pomegranate. Rafinesque states* that the split joints make a good emollient application for acute rheumatism, and, when baked, for chronic ulcers, gout, and recent wounds; the juice and gummy exudation, he says, is used in gravel. Dr. Porcher says† he is informed that a decoction of the joints is mucilaginous, and much used in Alabama as a demulcent drink in pulmonic and pleuritic affections. Merat‡ claims that the cut joints are discutient.

PART USED AND PREPARATION.—The fresh flowers and green ovaries are chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it and the rest of the alcohol added. The whole is then poured into a well-stoppered vial, and allowed to stand eight days in a dark, cool place. The tincture, separated from this mass by filtration, should have a slightly opaque straw-color by transmitted light; a slight odor of the flowers; a bitterish and astringent taste; and an acid reaction.

CHEMICAL CONSTITUENTS.—An analysis of the fruit was made by Mr. W. W. Light,§ and resulted in the determination of: Tartaric acid, $C_4H_6O_6$; citric acid mucilage, and coloring-matter. In the seeds a fixed oil, a fat acid, albumen, starch and glucose were found, but no glucoside nor alkaloid.

PHYSIOLOGICAL ACTION.—According to the experiments made by Drs. Burdick,|| Kunze and Fitch,¶ with doses varying from a small portion to a drachm of the tincture, the effects are as follows: Mental disturbances; acute pain in the globe of the eye; epistaxis; nausea in both stomach and bowels as if diarrhœa would set in; urging to stool; urine red, increased; coldness; and various pains, principally about the joints.

DESCRIPTION OF PLATE 61.

1. Two joints in flower and leaf, Salem, Mass., July 3d, 1885.
2. Section of flower, stamens and floral envelope removed.
3. Stamen.
4. Stigma.
5. Fruit.
6. Seeds.

(3, 4 and 6 enlarged.)

---

* *Med. Flora*, 2, 243. † *Resourc. South. Fields and Forests*, 66. ‡ *Dict. Univ. de Mat. Med.*, vi, 11.
§ *Am. Jour. Phar.*, 1884, 3. || *N. A. Jour. of Hom.*, 1874 48. ¶ *Trans. Ec. Med. Soc.*, 1875.

E.M. ad nat del. et pinxt.

ERÝNGIUM YUCCÆFÒLIUM, Michx.

GENUS.—**ERYNGIUM,*** TOURN.

SEX. SYST.—PENTANDRIA DIGYNIA.

ERYNGIUM.

BUTTON SNAKEROOT.

SYN.—ERYNGIUM YUCCÆFOLIUM, MICHX.; E. AQUATICUM, LINN. (IN PART).

COM. NAMES.—BUTTON SNAKEROOT, RATTLESNAKE MASTER, ERYNGO, CORN SNAKEROOT; (FR.) PANICANT D'EAU; (GER.) WASSERMANNSTREU.

A TINCTURE OF THE ROOT OF ERYNGIUM YUCCÆFOLIUM, MICHX.†

Description.—This peculiar, sedge-like perennial grows to a height of from 1 to 6 feet. *Stem* smooth, erect, and grooved. *Leaves* linear, six inches to two feet long, and one-half to one inch wide, taper-pointed, coriaceous, rigid, parallel-veined, gramineous, and remotely bristly-fringed upon the margins. *Inflorescence* in a terminal compound umbel, each peduncle bearing a compact head; *heads* broadly ovate; *bracts* entire, paleaceous, not spinous; *flowers* inconspicuous, white, all fertile, closely sessile; *leaves* of the *involucels* mostly entire, and shorter than the heads. *Calyx* 5-toothed; *teeth* persistent. *Petals* connivent, oblong, emarginate. *Styles* filiform. *Fruit* top-shaped, covered with little scales or tubercles, having no ribs and scarcely any vittæ, the inner face of each mericarp flat or nearly so.

Umbelliferæ.—This large and very natural order, of herbs, represented in North America by 50 genera and 187 species, is characterized as follows: *Stems* usually hollow and striate. *Leaves* alternate, mostly compound; *petioles* sheathing or expanding at the base. *Inflorescence* in terminal, compound umbels, often subtended by a whorl of bracts (*involucre*), usually also subtending the umbellets (*involucel*); *flowers* small, in many genera dichogamous. *Calyx* adherent to the whole face of the ovary; *limb* minute, entire or 5-toothed. *Petals* 5, usually inflexed at the point, imbricate or valvate in æstivation. *Stamens* 5, alternate with the petals, and inserted with them upon the disk. *Ovary* 2-carpelled, surmounted by the fleshy disk that bears the petals and stamens; *ovules* 2, anatropous; *styles* 2, distinct, or united at their thickened bases; *stigmas* simple. *Fruit* a cremocarp, consisting of 2 coherent achenia (*mericarps*) which separate along the middle interval (*commissure*), and are usually suspended from the summit of a slender

* Ἐρυγεῖν, *erygein*, to belch, from carminative properties.

† A much better name than *E. aquaticum*, Linn., as the plant never is truly aquatic with us.

prolongation of the axis (*carpophore*); *mericarps* marked lengthwise by 5 primary ribs, and often with 5 secondary intermediate, in the interstices or intervals between these ribs are commonly lodged few or many oil-tubes (*vittæ*), which are longitudinal canals in the substance of the fruit, containing aromatic oil. *Seeds* suspended from the summit of the mericarp; *embryo* minute; *albumen* hard. The flowers in this order are so minute, and so nearly alike in all genera, that the differentiation is usually, in great part, based upon the cremocarps.

Besides the seven species treated of in this work, we have provings of the following plants: The Persian Ammoniacum (*Dorema Ammoniacum*, Don.), a fetid, stimulating, discutient gum-resin; the European Celery (*Apium graveolens*, Linn.), which, though an acrid poison when growing in wet places, is a delightful salad when cultivated; the Thibetan Asafœtida (*Narthex Asafœtida*, Falc.), a fetid, stimulant, and antispasmodic gum-resin; the Central European Athamantha (*Peucedanum Oreoselinum*, Mœnch), an aromatic and powerful stimulant; the North European and Asiatic Water Hemlock (*Cicuta virosa*, Linn.), a dangerous, acrid, narcotic poison; the European Sea Holly (*Eryngium maritimum*, Linn.), a sweet, aromatic, tonic and diuretic; the Italian Giant Fennel (*Ferula glauca*, Linn.), a stimulating antihysteric; the Mediterranean Fennel Seed (*Fœniculum officinale*, Allioni.), an aromatic stimulant and carminative; the European and North Asiatic Cow-Parsnip, Branca Ursina (*Heracleum Sphondylium*, Linn.), an acrid vesicant; the subtropical Indian Pennywort (*Hydrocotyle Asiatica*, Linn.), noted as a remedy for leprosy, ichthyosis, and rheumatism; the European Masterwort (*Imperatoria ostruthium*, Linn.), a febrifuge, antiperiodic, and masticatory in toothache; the European Hemlock Dropwort (*Œnanthe crocata*, Linn.), a narcotico-acrid poison of great virulence; the Sardinian Parsley (*Petroselinum sativum*, Hoff.), a noted diuretic pot-herb; the European Water Dropwort (*Phellandrium aquaticum*, Linn.), which partakes of the poisonous nature of Œnanthe, but is less dangerous; the Levantine Bibernell or Burnet Saxifrage (*Pimpinella Saxifraga*, Linn.), an astringent, masticatory, also used to remove freckles; the Central Asiatic Sumbul (*Ferula Sumbul*, Hook., f.), a Russian "specific" for cholera, that failed and was afterward used as an antihysteric, and remedy for hypersecretive mucous membranes; the Northern Europe and Asiatic Caraway (*Carum Carui*, Linn.), a well-known aromatic stimulant and condiment; and lastly, the European Water Parsnip (*Sium latifolium*, Linn.), an acrid, narcotic poison.

Many other species are used in general medicine.* The European Turbith (*Laserpitium latifolium*, Jacq.), yields an acrid, bitter, caustic, and violently purgative gum-resin. The European genus *Anthriscus*, yields two species, *A. sylvestris*, Hoff., and *A. vulgaris*, Pers., that are acrid, narcotic poisons; while *A. Cerefolium*, Hoff., is an agreeable pot-herb, called Chervil. The South Russian *Cachrys odontalgica*, Pall., is, as its name denotes, a remedy for aching carious teeth. The Indian and Levantine Fructus Ptychotis (*Carum Ajowan*, Bentl.), is carminative, and the oil antiseptic. The European and Levantine genus *Pim-*

* Concerning this order it is noteworthy, that those which grow near water are generally acrid, narcotic poisons, while those seeking dry soils are little else than carminative.

pinella yields the well known Anise (*P. Anisum*), an aromatic stimulant and carminative, as well as *P. dissecta*, Retz., and *P. magna*, Linn., which have properties similar to those of P. Saxifraga, mentioned above. The genus *Ferula*, which includes *Narthex*, yields the following substances, beside Sumbul and Asafœtida mentioned above: African Gum Ammoniacum from *F. tingitana*, Linn.; Persian Galbanum is produced by *F. Galbaniflua*, and *F. rubricaulis*, Boiss.; it saction is considered to be intermediate between asafœtida and ammoniacum. Asafœtida is also produced by *F. Scorodosma*, Bentl., and *F. alliacea*, Bois. (*F. Asafœtida*, Linn., cannot be decided upon. It was founded upon Kæmpfer's descriptions and fragmentary specimens, neither of which are conclusive.—Bentley). The European genus, *Peucedanum*, contains, beside Athamantha, the following medicinal species: Sulphur-wort (*P. officinale*, Linn.), reputed diuretic and antispasmodic; Marsh Parsley (*P. palustre*, Mœn.), a famous Courland remedy for epilepsy; and Dill (*P. graveolens*, Hiern.), a stimulant and carminative. The European and Asiatic Coriander (*Coriandrum sativum*, Linn.), is an aromatic stimulant and carminative; the Levantine Cumin (*Cuminum Cyminum*, Linn.), a stimulant, carminative, and discutient. The European genus, *Daucus*, yields the common Carrot (*D. Carrota*, Linn.), whose seeds are diuretic, and root a well known esculent; while the Sicilian *D. gummifer*, Lam., and Corsican *D. Gingidum*, Linn., are supposed to yield the Bdellium of the old Pharmacopœias.* Opoponax is a fetid deobstruent, and antispasmodic gum-resin, produced by the juice of *Pastinaca Opoponax*, Linn. The Alpine Lovage (*Ligusticum levisticum*, Linn.), is carminative, stimulant, diuretic, and emmenagogue. The root of the European *Astrantia major*, Linn., is acrid and purgative. The European Eringo (*Eryngium campestre*, Linn.), is considered by Boerhaave, the first of aperient, diuretic roots. It has been also recommended in gonorrhœa, hepatic and intestinal obstructions, and suppression of the menses, and considered aphrodisiac; its scope is considered larger than that of the Sea Holly mentioned above. The Italian Bracala (*Angelica nemorosa*, Ten.), furnishes the Neapolitans with a remedy for the itch. Samphire, a saline aromatic, is the product of *Crithum maritimum*, Linn. Alexanders are the aromatic fruits of the European *Smyrnium Olusatrum*, Linn., formerly used instead of celery.

Asa Dulcis—in contradistinction to Asa Fetida—which enjoyed the highest reputation among the ancients, as an antispasmodic, emetic, deobstruent, and diuretic,† is yielded by *Thapsia garganica*, Linn., or the nearly allied *T. sylphium;* the resin of the root is said to be fully as active and thorough a vesicant as croton oil; it deserves a careful proving. Numerous other species have held a place in medicine, and deserve mention, but the above list covers their action.

Beside the edible species already mentioned, carrots, parsnips, celery, and chervil, many other plants of this order are eaten. *Prangos fabularia*, Lindl., is suggested by Royle to be the Συλφιον of the Greeks, mentioned by Alexander's

* India Bdellium is referred to *Balsamodendron mukul*, and African Bdellium to *B. Africanum*, Arn. (Burseraceæ).

† This was the Laser cyrenaicum of Cyrene, a drug in high reputation among the ancients for its medical uses; it had miraculous powers assigned to it, such as neutralizing the effects of poison, curing envenomed wounds, restoring sight to the blind, and youth to the aged. So great was its reputation that the princes of Cyrene caused it to be struck on the reverse of their coins; and the Cyrenian doctors were reckoned among the most eminent in the world. Its value was estimated by its weight in gold.—Lindley.

historians as a highly nutritious food for cattle, and even man, of heating and fattening qualities. The American Aborigines use several species, prominent among which Mr. Dodge* mentions the following:

"*Dill* (*Peucedanum graveolens*, Wats.), called by the Snakes and Shoshone Indians *Yampah*.—This spindle-shaped root grows in low, timbered bottoms, and is esteemed as the best of its kind when used for food. It is analogous to the parsnip, and is an article of commerce among the Indians. The seeds are used to flavor soup."

"*Podosciadium Californicum*, Gray.—The tubers of this species form one of the dainty dishes of the Oregon Indians. They are black, but when boiled like potatoes they burst open lengthwise, showing a snowy-white farinaceous substance, which has a sweet, cream-like taste, with a slight parsley flavor. It is an excellent root, the cultivation of which might prove useful among the whites."

"*Kouse root* (*Peucedanum ambiguum*, Nutt.).—The root of this plant is dug in April or May when in bloom. It grows on hills and mountains which are so poor that grass will not grow upon them. When fresh it is like the parsnip in taste, and as it dies becomes brittle and very white, with an agreeable taste of mild celery. It is easily reduced to flour. When its brown epidermis is removed, innumerable small dots are revealed. Both the roots and the flour will keep several months. It is sometimes called bread or biscuit root by travelers, and Kouse root by the Indians of Oregon and Idaho. The Canadians know it by the name of *Racine blanc*. After the bread has been made a short time, its taste is not unlike that of stale biscuits. When the roots have been pounded fine, the flour is pressed into flat cakes, one foot wide, three feet long, and from a quarter to half an inch thick, of an oblong rectangular form, with a hole in the middle by which they are fastened on the saddles when traveling. The cakes have a ribbed appearance, caused by being laid on sticks stretched over the tent fires, for the purpose of smoke-drying or baking the bread. When broken up the bread has a coarse, granulated appearance, especially when not ground very fine, and is very insipid."

History and Habitat.—Eryngium Yuccæfolium is indigenous to North America, where it ranges from New Jersey to Wisconsin and southward. It habits damp or dry prairies and pine barrens, and blossoms in July and August.

This species was valued highly by the Aborigines as an alexiteric, and, combined with Iris versicolor, as a febrifuge and diuretic; since their time it has come into use by first the laity, then the physician, as a stimulant, diaphoretic, sialogogue, expectorant, diuretic, and alterative. A decoction of the root has been found useful in dropsy, nephritic and calculous disorders; chronic laryngitis and bronchitis; irritation of the urethra, vaginal, uterine, and cystic mucous membranes; gonorrhœa, gleet, and leucorrhœa; mucoid diarrhœa; local inflammations of the mucous membranes; exhaustion from sexual depletion with loss of erectile power, seminal emissions, and orchitis. By some physicians it has been preferred to Seneka snakeroot for its sphere, and by others it has been considered fully equal to Contrayerva. The powdered root is said to make a fine escharotic

* *U. S. Agric. Rep.*, 1870, pp. 405-7.

application to fungoid growths and indolent ulcerations, preventing gangrene, and stimulating them to resolution.

The plant is not officinal in the U. S. Ph.; in the Eclectic Dispensatory the preparation recommended is *Decoctum Eryngii.*

PART USED AND PREPARATION. — The fresh root, gathered after the fruits are fully ripe, is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-sixth part of it, and the rest of the alcohol added. After having stirred the whole well, pour it into a well-stoppered bottle, and allow it to stand for eight days in a dark, cool place. The tincture, separated by decanting, straining, and filtering, has a clear reddish-orange color by transmitted light; an odor much like that of an old chest that has been shut up with oil-cloth for some time; a bitterish, acrid, and terebinthic taste; and an acid reaction. It leaves a sensation deep in the throat, much like that following Senega.

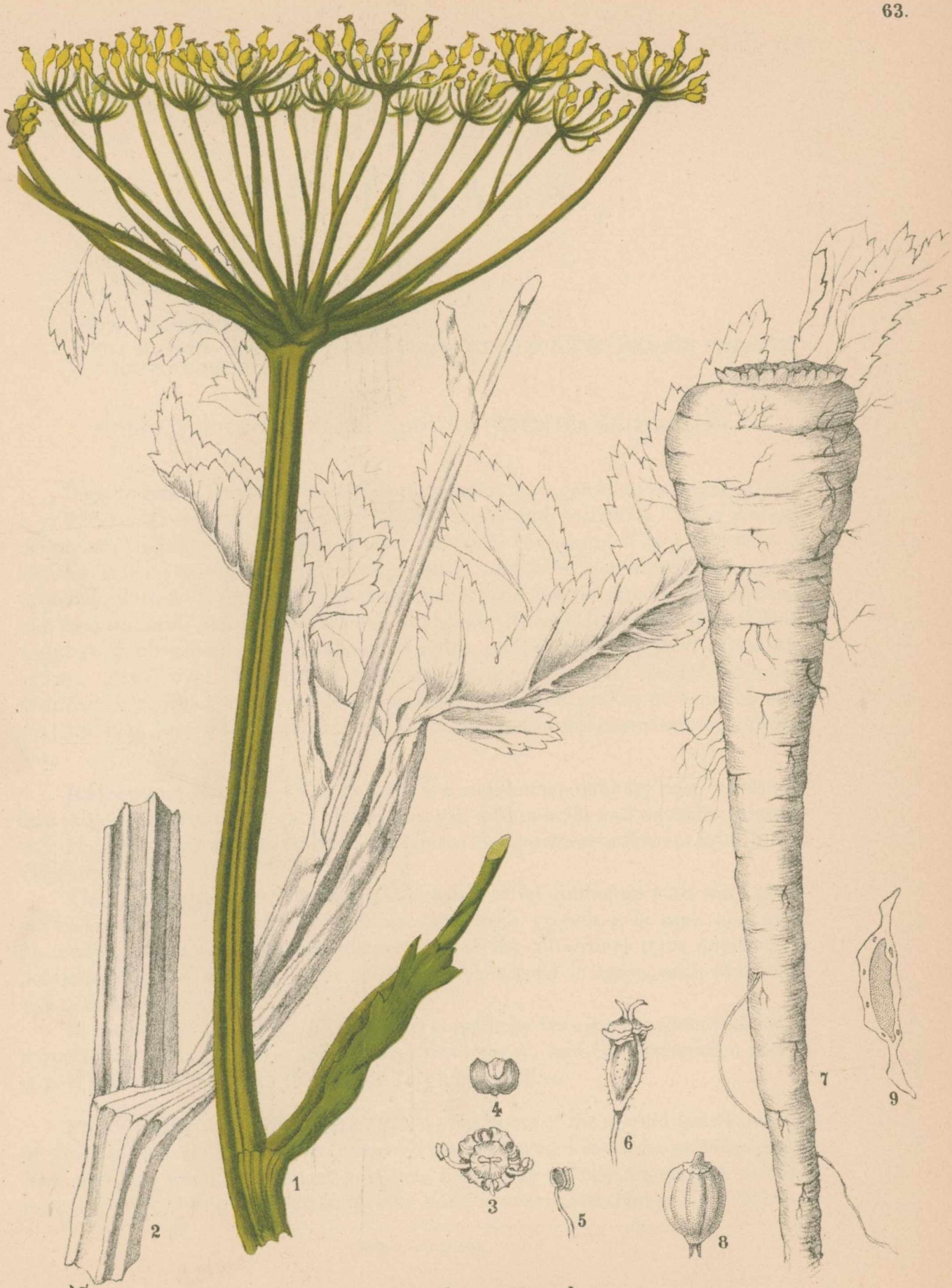
CHEMICAL CONSTITUENTS.—This root yields its properties to both water and alcohol, and probably contains an acrid, volatile oil, a bitter principle, and sugar. No analysis has been made of the root; the tincture, however, shows the presence of a small amount of resin.

PHYSIOLOGICAL ACTION.—According to the experiments of Drs. C. H. McClelland, C. H. Coggswells, and W. G. Jones, Eryngium causes, in doses of from 5 to 150 drops of the tincture: Depression of spirits; vertigo and headache; irritation of the palpebral mucous membrane, followed by purulent discharges; inflammation of the eustachian tube, followed by a discharge of fetid pus; a similar condition of the nasal and pharyngeal mucous membranes; nausea and burning in the stomach; colic; constipation, with tenesmus; frequent desire to urinate, with a decrease in quantity daily passed; stinging, burning sensation in the urethra, severe pain in left testicle, depression of sexual desire, followed by excitation, lewd dreams, pollutions, and discharges of prostatic fluid; a sensation of dyspnœa, and constriction of the throat;* and slight increase in the heart's action.

DESCRIPTION OF PLATE 62.

1 and 2. Whole plant, from St. Augustine, Fla., Aug. 2d, 1886.
3. Flower.
4. Calyx and styles.
5 and 6. Petals.
7 and 8. Stamens.
9. Fruit.
(3–9 enlarged.)

* This symptom followed my tasting the tincture for the above description, and became, in half an hour, so strong as to be decidedly uncomfortable.—C. F. M.



Ĉ.m. ad nat del. et pinxt.

PASTINÀCA SATÌVA, Linn.

GENUS.—**PASTINACA,*** TOURN.

SEX. SYST.—PENTANDRIA DIGYNIA.

PASTINACA.

PARSNIP.

SYN.—PASTINACA SATIVA, LINN.

COM. NAMES.—GARDEN PARSNIP OR PARSNEP; (FR.) PANAIS POTAGER; (GER.) PASTINAKE.

A TINCTURE OF THE FRESH ROOT OF PASTINACA SATIVA, LINN.

Description.—This usually cultivated biennial herb grows to a height of from 3 to 6 feet. *Root* conical, long and slender, fleshy and succulent. *Stem* smooth, deeply and plentifully grooved. *Leaves* pinnately compounded of 3 to 8 pairs of shining leaflets; *leaflets* ovate or oblong, obtuse cut-toothed or coarsely serrate, the terminal 3-lobed, all somewhat pubescent beneath; *petioles* sheathed. *Umbels* large and flat; *involucre* and involucels small or absent; *flowers* all perfect, none radiant. *Calyx-teeth* obsolete. *Petals* yellow, roundish, entire, involute; *point* broad and retuse. *Fruit* oval, flat, with a thin, single-winged margin; *carpels* minutely 5-ribbed, 3 of which are dorsal and equidistant, 2 lateral and at or near the margin; *vittæ* as long as the carpel, 1 in each sulcus, 2 in the commissure; *albumen* flat.

History and Habitat.—The Parsnip is a well-known culinary root, introduced into this country from Europe. It has now run wild in fields and waysides throughout the central and eastern parts of the United States, where it flowers from July to October.

The root is succulent, nutritious, sweet and in its cultivated state very pleasant to many, but when wild or in its second year's growth, it is rank and acrid poisonous, causing emesis and inflammation of the alimentary tract, followed by flatulent colic and diuresis. The seeds have been used in agues, with what curative action I cannot state.

In the north of Ireland a kind of beer is made by brewing the roots with hops; a good wine is also made in some places from them; and by distillation a sort of rum is produced similar to that of the sorghum product.

PART USED AND PREPARATION.—The roots of the second year's growth, or those of wild individuals, are prepared and macerated as in the previous plant. The resulting tincture is almost colorless, being but slightly tinged with yellow; is very gummy, has a peculiar honey-like odor, a sweet taste, and an acid reaction.

---

* *Pastus*, nourishment.

CHEMICAL CONSTITUENTS.—No analysis has yet been made to determine an active principle. Sugar abounds in the root, also starch and a gummy extractive.

PHYSIOLOGICAL ACTION.—Several cases of poisoning are recorded from the use of the wild or old roots. The symptoms following their ingestion are: Illusions of sight, dilated pupils, vertigo, difficult breathing, weak, slow pulse, and quiet delirium dependent upon the visions. In Dr. Pupcke's cases, where seven children ate of the cooked wild roots,* "all labored under 'delirium tremens,' they were in constant motion, talked incessantly, without knowing what they said, and fancied they saw objects which had no existence; they fought with each other, and occasionally had attacks of convulsive laughter; they rejected everything that was offered them, and were obliged to be restrained by force."

All the symptoms of the drug point to severe gastric irritation, with reflex action upon the brain and spinal cord.

DESCRIPTION OF PLATE 63.

1. Summit of a wild individual in young fruit, Binghamton, N. Y., June 26th, 1885.
2. Part of stem.
3. Face of flower.
4. Petal.
5. Stamen.
6. Ripe pistil.
7. Root.
8. Seed.
9. Section of a carpel.

(3–6 and 8–9 enlarged.)

* *Pharm. Jour.*, 1848, 184.

Fm. ad nat. del. et pinxt.

ARCHANGÉLICA ATROPURPÙREA, Hoffm.

GENUS.—**ARCHANGELICA,*** HOFFM.

SEX. SYST.—PENTANDRIA DIGYNIA.

ANGELICA ATROPURPUREA.

GREAT ANGELICA.

SYN.—ARCHANGELICA ATROPURPUREA, HOFF.; ANGELICA ATROPURPUREA, LINN.; A. TRIQUINATA, MX.; IMPERATORIA LUCIDA, NUTT.

COM. NAMES.—COMMON ANGELICA,† HIGH ANGELICA, MASTERWORT.‡ (GER.) PURPURFARBIGE ANGELICA.

A TINCTURE OF THE WHOLE PLANT ARCHANGELICA ATROPURPUREA, HOFF.

Description.—This strong-scented, perennial herb grows to a height of from 4 to 6 feet. *Root* somewhat conical. *Stem* very stout, smooth, dark-purple, and hollow. *Leaves* 2 to 3 ternately-compound; *leaflets* 5 to 7 pinnate, ovate, sharply cut-serrate, acute, and pale beneath, the three terminal ones often confluent and somewhat decurrent at the base. *Inflorescence* a globular compound umbel. *Involucre* little or none; *involucels* of very short, subulate leaflets. *Calyx* with very short teeth. *Petals* ovate, entire, with the sharp tips inflexed. *Fruit* smooth; *carpels* somewhat compressed, furnished with 3 rather prominent dorsal ribs, and the two lateral ones prolonged into marginal wings; *vittæ* not on the pericarp, but surrounding the seed and adherent to its surface; *seed* convex upon the back and flattish upon the face, very loose in the pericarp. Read description of the order under 62.

History and Habitat.—The Great Angelica is indigenous to North America, from Pennsylvania and Wisconsin northward, where it habits low grounds along streams, and flowers in June.

When fresh the roots are poisonous, and are said to have been used for suicidal purposes by the Canadian Indians; when dried, however, they lose this quality, and are then considered carminative, diuretic, emmenagogue and stimulant. The dried root was often used, especially in combination with other and better-known diuretics, in anasarca and various diseases of the urinary organs; and alone in flatulent colic and suppressed menstruation. Dr. Schell claims§ that

---

* This name alluded to its supposed high *angelic* properties.

† The common Garden Angelica is *A. archangelica.*

‡ The true Masterwort is the European *Imperatoria ostruthium*, Linn.; the Cow Parsnip, *Heracleum lanatum*, Linn., is often wrongly called by this name.

§ *Fam. Guide to Health*, 1856, corroborated in *Am. Jour. Hom. Mat. Med.*, i. 272.

doses of 15 to 20 grains of the dried root will cause a disgust for all spirituous liquors. The stems were often made into a candied preserve in some sections of the country—a practice now nearly extinct. Its uses, all in all, have been greatly similar to those of the Garden Angelica (*Angelica officinalis*, Hoff.; *A. archangelica*, Linn.).

PART USED AND PREPARATION.—The whole plant, when in seed, is chopped and pounded to a pulp, and treated as in the preceding species. The tincture, after filtration, has a clear greenish-orange color, a somewhat terebinthic odor, a sweetish taste, and neutral reaction.

CHEMICAL CONSTITUENTS.—This plant has not been specifically examined for the determination of its principles. Its oils, however, may be, in all probability, compared with those of *Angelica archangelica*.

PHYSIOLOGICAL ACTION.—Uninvestigated.

DESCRIPTION OF PLATE 64.

1. Whole plant 9 times reduced, Binghamton, N. Y., July 6th, 1885.
2. Portion of upper stalk, showing petiole.
3. Flower (petals removed).
4. Pistil.
5. Horizontal section of fruit.

(3–5 enlarged.)

Fm. ad nat. del. et pinxt.

ÆTHÙSA CYNÀPIUM, Linn.

GENUS.—**ÆTHUSA,*** LINN.

SEX. SYST.—PENTANDRIA DIGYNIA.

ÆTHUSA.

FOOL'S PARSLEY.

SYN.—ÆTHUSA CYNAPIUM, LINN.; CICUTARIA TENUIFOLIA, RAII.; C. FATUA, LOB.; CORIANDRUM CYNAPIUM, CRANTZ.

COM. NAMES.—FOOL'S PARSLEY, DOG'S PARSLEY, DOG POISON, GARDEN HEMLOCK, LESSER HEMLOCK, SMALL HEMLOCK; (FR.) LA PETITE CIQUË; (GER.) KLEINER SCHEILING, HUNDSPETERSILIE.

A TINCTURE OF THE WHOLE PLANT ÆTHUSA CYNAPIUM, LINN.

Description.—This fetid annual herb attains a growth of from 8 inches to 2 feet. *Stem* erect, unspotted, striate, and fistulous. *Leaves* dark green, 2-3-ternately compound, many cleft; *divisions* pinnate, wedge-lanceolate, obtuse. *Umbels* terminal and opposite the petioles; *rays* very unequal; *involucre* none; *involucels* one-sided, 3-leaved, the leaves erect while the buds are immature, but become long, narrow, and pendent when in full flower and fruit. *Flowers* white; *calyx teeth* obsolete; *petals* obovate, appearing emarginate, or even obcordate, by the inflexion of the tip. *Fruit* ovate-globose, not much if at all flattened either way; *carpophore* 2-parted; *mericarps*, each with 5 thick, sharply-keeled ridges; *vittæ*, single in the deep intervals, and 2 in the commissure at its base.

History and Habitat.—The Fool's Parsley is indigenous to Europe and Siberia, from whence it has been introduced into this country where it now grows, still sparingly, along roadsides and waste places about cultivated grounds, in New England, and from there to Pennsylvania, flowering in July and August.

On account of the many cases of poisoning by the inadvertent use of this herb for parsley, from which it is easily distinguishable,† very little use has been made of it by physicians. By the early writers it is so often confounded with Conium, that it is very difficult to trace its history. The first author to characterize it was Hermolaus Barbarus, who called it *Cicuta terrestris minore;* it is also mentioned by Matthiolus, Jonston, Jungius, Müller, and others, all speaking of its peculiar effects when eaten. Its action has been generally considered like that of *Conium*, but milder, and its principal, if not its only use, was in some forms of obstinate cutaneous disorders. It is not mentioned in the U. S. Ph., nor is it found in the Eclectic Dispensatory.

---

* Αἰθύσσω, *aithusso*, to set on fire; in reference to the acrid taste of the plant.

† Æthusa has much darker-green foliage than Parsley, a nauseous smell, white flowers, and the leaf-sections are much more acute.

PART USED AND PREPARATION.—The whole fresh plant, when in flower and fruit, is treated as directed under Eryngium (62). The resulting tincture has a clear, orange-brown color by transmitted light; a fetid, disagreeable odor; an acrid taste; and an acid reaction.

CHEMICAL CONSTITUENTS.—*Cynapin.* This alkaloid was discovered by Ficinus, who describes it as crystallizing in prisms that are soluble both in alcohol and water, but not in ether, and as having an alkaline reaction, and forming a crystallizable salt with sulphuric acid.* Walz describes an alkaloid, resulting as a volatile oily liquid, in which he is upheld by the experiments of Bernhart,† who succeeded in isolating a like substance, which he describes as having a strong alkaline reaction, an exceedingly penetrating, offensive odor, and as being soluble in alcohol. The body seems, as yet, to have received no further investigation.

PHYSIOLOGICAL ACTION.—The following excerpt, from one of the prominent botanical journals,‡ being of late date, serves to introduce this rubric:

"'*Fool's Parsley' not Poisonous.*—For several centuries the plant *Æthusa Cynapium*, L., has been the object of suspicion, and classed among poisons by botanists and toxicological writers. But now Dr. John Harley, of England, comes forward and presents a vindication of what he calls 'an innocent and harmless plant.' In the St. Thomas' Hospital Reports, he relates a number of facts to prove the correctness of his conclusions. The juices of the plant, from the root as well as from the leaves, were obtained by expression just before flowering, and also after the plants had reached maturity and set fruit. Being thus provided with a supply of material, representing the active properties of the plant, he exhausted it upon four patients,—one a little girl, four years old, who took the extract in quantities ranging from 2 drachms to 2 ounces; himself, who took it in quantities ranging from 2 to 4 fluid ounces; and two other adults, who were the subjects of spasmodic wry-neck. These two took one or other of the juices, in doses ranging from 1 to 8 fluid ounces. Effects were anxiously looked for, but absolutely none followed in any of the cases. Dr. Harley therefore feels compelled to assert that *Æthusa Cynapium* of Sussex, Essex, Kent, Surrey, and Hertfordshire, is not only absolutely free from the noxious properties attributed to it, but that it is pleasant to sight, smell, and taste, and, in the absence of the more fragrant and succulent plants, might well be used as a pot-herb or salad. He is satisfied, further, that his conclusions are independent both of locality and season, and that the only influence which these conditions have on Fool's Parsley, as on hemlock (*Conium maculatum*), is to increase or diminish its succulency. Dr. Harley, some years ago, made some observations on the last-mentioned plant, and came to the same conclusion in regard to its innocuous nature that he has concerning that of the *Æthusa*. In connection with this, it may be stated that *Conium maculatum*, in northern latitudes—Russia for example—is eaten with impunity, although precaution is taken to first boil it in several waters. This subject of the harmlessness, under certain conditions, of plants reputed to be poisonous, recalls to mind the

* Wittstein. † *Arch. de Phar.*, 1880, 117 (*Am. Jour. Phar.*, 1880, 204). ‡ *Bull. Torr. Club*, 1881, 9.

statement of Linnæus, in his *Flora Lapponica*, that the Norlanders prepare from the leaves of *Aconitum Napellus* a broth, which they eat without any injurious effects resulting therefrom."

The following cases of poisoning by the drug, serve, however, to show its action upon the system:

"A boy, six years of age, having eaten some of this herb, by mistake for Parsley, at 4 o'clock in the afternoon, commenced immediately to cry out in great pain, and complained of great cramps in the stomach. Whilst taking him home the whole body became excessively swollen, and of a livid hue; the respiration became difficult and short, and he died toward midnight. Another child was poisoned in the same manner, but he was fortunate enough to vomit up the herb. This, however, did not prevent many symptoms manifesting themselves; he talked wildly, and in his delirium he thought he saw numbers of dogs and cats."—(*Orfila*, vol. ii, p. 324.)

"Gmelin has related the case of a child who died in eight hours, in consequence of having eaten the Æthusa. The symptoms were spasmodic pains in the stomach; swelling of the belly; lividity of the skin; and difficult breathing."—(*Chris.*, p. 365.)

"A woman gave two of her children soup, in which some of this was boiled. They were both seized with severe pain in the abdomen, and next morning there was perfect unconsciousness; the lower jaw was spasmodically fixed; abdomen tumid; vomiting of a bloody mucus, and constant diarrhœa; cold extremities; convulsions; and death in twenty-four hours. Post-mortem appearance: redness of the lining-membrane of the œsophagus, and slight vascular congestion of stomach and duodenum."—(*Medic. Jahrbuch.*)

"Another child, who had eaten the bulbs by mistake for young turnips, was suddenly seized with pain in the abdomen, followed by nausea, without vomiting; could not swallow; vacuity; inability to answer questions; lower jaw fixed; insensibility and death an hour after the commencement of the symptoms."—(*Med. Times*, August 23, 1845.)

"A healthy, strong man, about thirty-five years of age, a publican, ate a handful of Fool's Parsley, with nearly the same quantity of young lettuce, about 1 o'clock P. M.; in about ten minutes he was affected with a pain in the stomach and bowels, attended with a rumbling. He walked out in the fields, but was seized with such languor, weariness, and weakness, that he supported himself with difficulty. He was much troubled with giddiness in the head; his vision was confused, and sometimes objects appeared double. At 7 o'clock he got an emetic, which brought up, he supposes, all the Fool's Parsley, but none of the lettuce; this relieved him of the unpleasant symptoms in the stomach, but the other sensations continued, and he passed a restless night. Next day he had much pain in his head and eyes, which last were inflamed and bloodshot. He had different circumscribed swellings in his face, which were painful and inflamed, but they were transient, and flew from place to place. On the Saturday his eyes were highly inflamed, painful, and entirely closed by the surrounding inflammation. He was

bled, which gave him much relief in his face and eyes. From this time until the Monday, he continued to get better, but had, even then, pain, heat, and inflammation of the eyes, with œdematous swelling of the cheeks; his remaining symptoms went off gradually."—(*Lowe.*)

Riviere relates that a person died after taking this plant. "His tongue was black; a brownish serosity was found in the stomach; the liver was hard, of a yellow color; the spleen livid; but the body was not at all emphysematous."

The symptoms of poisoning by this drug show, according to Schulze, that its chief action is upon the medulla spinalis.

On Animals.—Seven ounces of the juice of the leaves were given to a strong dog, and the œsophagus tied. Twenty minutes thereafter the dog became sick; in half an hour it did not seem to affect him much, when suddenly he stretched out his limbs and lay upon his stomach; in a few minutes he tried to arouse himself, but his efforts were in vain. The muscles of the limbs, particularly of the posterior, refused to obey the will, but the organs of sense exercised their functions; the pupils were scarcely dilated; the pulsations of the heart were slow and strong. This state lasted a quarter of an hour, and then the extremities were agitated by convulsive movements; the animal threw himself from one side to the other, his senses began to be enfeebled, and the œsophagus and fauces were spasmodically contracted. This state of stupor increased, and the animal died an hour after taking the poison. On opening the body the heart was found to be contracted, and the left ventricle contained fluid and black blood; the lungs were a little less crepitant than natural. The stomach was found full of the poison, but there was no alteration of the digestive canal.*

DESCRIPTION OF PLATE 65.

1. End of flowering plant.
2. Bract of the involucel.
3. Flower.
4. Stigmas.
5. Fruit.
6. Dorsal view of a mericarp.
7. Commissural view of same.
8. Section of same.

(2, 4, and 6 enlarged.)

* *Orfila*, vol. ii, 323.

Fm. ad nat. del. et pinxt. THÁSPIUM AÙREUM Var ÁPTERUM, Gray.

GENUS.—**THASPIUM,*** NUTT.

SEX. SYST.—PENTANDRIA DIGYNIA.

ZIZIA.†

MEADOW PARSNIPS.

SYN.—THASPIUM AUREUM, NUTT.; ZIZIA AUREA, KOCH.; SMYRNIUM AUREUM, LINN.; SMYRNIUM LUTEUM, MUHL.; SMYRNIUM ACUMINATUM, SMITH; SISSON TRIFOLATUM, MICHX.; SISSON AUREUS, SPRENG.

COM. NAMES.—MEADOW PARSNIP, GOLDEN MEADOW PARSNEP, GOLDEN ALEXANDERS, ROUNDHEART; (GER.) GOLDEN PASTINAKE.

A TINCTURE OF THE WHOLE PLANT THASPIUM AUREUM, NUTT.

Description.—This erect, perennial herb attains a height of from 1 to 3 feet. *Root* tap-shaped, 2 to 4 inches long by ½ to ¾ of an inch in diameter, yellow internally. *Leaves* 1- to 2-ternately parted or divided; *lower leaves* on long petioles, sometimes simple or more or less cordate; *upper leaves* sessile or nearly so; *leaflets* 1 to 2 inches long, oblong-lanceolate, cut serrate, the *bases* elongated cuneate. *Inflorescence* axial or terminal compound umbels, on long, naked peduncles; *involucre* inconspicuous or absent; *pedicels* 10 to 20 elongating in fruit; *involucels* minute, few-leaved; *flowers* deep, orange-yellow. *Calyx teeth* obscure. *Petals* oblong, terminated by an inflexed tip. *Fruit* oval-oblong, somewhat flattened or laterally contracted; *ridges* 10-winged; *transverse section* orbicular; *vittæ* solitary in each sulcus, and 2 in the commissure. Read description of the natural order, under Eryngium, 62.

History and Habitat.—The Meadow Parsnip is quite a common indigenous plant on the moist banks of streams, and in open, wet woods, where it flowers in June and July. I find no mention of this plant in medical literature. The genus is spoken of by Rafinesque‡ as vulnerary, antisyphilitic, and sudorific.

PART USED AND PREPARATION.—The whole fresh plant (the prover used only the root) is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-sixth part of it, and the rest of the alcohol added. After having stirred the whole well, pour it into a well-stoppered bottle, and allow it to stand eight days in a dark, cool place.

---

* A play upon the genus *Thapsia*, named from the Isle of Thapsus.

† I have retained the name under which the plant was proven. See second synonym.

‡ *Med. Bot.*, vol. ii, p. 267.

The tincture, separated from this mass by straining and filtering, should have a deep brownish-orange color by transmitted light, no distinguishing odor, a slightly bitter taste, and strong acid reaction. It leaves a numb, furry sensation upon the tongue, something like the impression left by tincture of aconite.

PHYSIOLOGICAL ACTION.—The Meadow Parsnip appears to uphold the general action of the Umbelliferæ, and act specifically in a similar manner to Æthusa. The symptoms of those proving the drug under the direction of Dr. E. E. Marcy are those of a nerve irritant. The only report of a toxic quantity being taken is that by Judge Gray of a young lady who ate a large root. In this case violent vomiting followed immediately, ejecting the root in time to ward off any farther action.*

DESCRIPTION OF PLATE 66.†

1. 1*a* to 1*b*, upper part of plant, Ithaca, N. Y., June 3d, 1880.
2. Flower (enlarged).

---

* Marcy, in *Ency. Pure Mat. Med.*, vol. x, p. 634.

† This Plate has been titled *Thaspium aureum*, var. *apertum*; but the seed, the only characteristic of var. *apertum*, having been omitted, it reverts to its proper title—*i. e.*, *Thaspium aureum*, Nutt.

Shortly after taking note of the physical properties of the tincture here recorded,—during which I made many futile attempts to detect a characteristic odor and taste, and took probably about 10 minims,—the tongue felt fuzzy and numb. This sensation was followed by a feeling as if the tongue had been scalded with hot tea; my eyes began to water and smart; I ceased writing, and threw myself upon my lounge (12 M.); my face then began to feel suffused with blood and soon became hot, especially the cheeks and forehead; drowsiness followed, and I fell into a distressingly dreamy sleep, lasting an hour. When I awoke (1.30 P. M.) all symptoms had passed away except the scalded sensation of the tongue, which lasted fully an hour longer.

F.M. ad nat del. et pinxt.

CICÙTA MACULÀTA, Linn.

GENUS.—**CICUTA,*** LINN.

SEX. SYST.—PENTANDRIA DIGYNIA.

CICUTA MACULATA.

WATER HEMLOCK.

SYN.—CICUTA MACULATA, LINN.; CICUTARIA MACULATA, LAM.; SIUM DOUGLASII, (?) D. C.

COM. NAMES.—AMERICAN WATER HEMLOCK, SNAKEWEED, BEAVER POISON, MUSQUASH ROOT, SPOTTED COWBANE, DEATH OF MAN, CHILDREN'S BANE; (FR.) CIQUE D'AMERIQUE; (GER.) AMERIKANISCHER WASSERSCHIERLING.

A TINCTURE OF THE FRESH ROOTS OF CICUTA MACULATA, LINN.

Description.—This poisonous marsh perennial attains a growth of from 3 to 6 feet. *Root* a fascicle of several oblong, thick and fleshy tubers. *Stem* stout and smooth, fistulate, streaked with purple (*not maculate*), or when growing in open places deep purple, and in shady situations wholly green. *Leaves* bi-ternately compound, the lower on long petioles; *leaflets* oblong-lanceolate, pointed, and sometimes lobed; *margins* mucronately coarse-serrate, the veins ending in the notches. *Inflorescence* in long peduncled, axillary umbels; *involucre* few-leaved or wanting; *involucels* 5 to 6 leaved; leaflets linear; *flowers* white. *Calyx* minutely 5-toothed; *teeth* acute. *Petals* obcordate, with an inflexed, pointed tip. *Fruit* aromatic, almost globular, geminate, and a little contracted at the sides. *Carpels* with 5 strong, flattish ribs, the lateral ones marginal; *vittæ* large, single in the intervals, double in the commissure; *seeds* terete. Read description of the order under Eryngium, 62.

History and Habitat.—The Water Hemlock is indigenous to the United States from Florida and Mississippi northward, where it grows in wet places, and flowers in June and July.

Cicuta had, until the publication of Dr. Bigelow's work,† been considered more as a poison than a drug, a few practitioners only using very small doses as a substitute for conium, and some of the laity, little knowing its toxic properties, as a gargle in sore throat. Rafinesque claims that its roots were eaten by such Indians as were tired of life and desired a speedy demise. Later the powdered leaves were employed to a limited extent to alleviate the pain of scirrhus cancers. Cicuta plays no part in any system of medicine except the homœopathic.

---

* The ancient Latin name, in reference to the hollow stems of this genus, the name Cicuta designating the hollow joints of reeds from which pipes were made.

† *Am. Med. Bot.*, Boston, 1817.

The specific name *maculata* is badly chosen, as the stems, as far as I have observed, are never spotted, nor do I find any record of such a marking having been noticed; Dr. Bigelow modestly offers the name *fasciculata*, which is true of the roots, and should be adopted, being much less like that of conium. Great similarity is said to exist between this species and the European *C. virosa*. Not having had an opportunity to examine the latter, I am at present unable to differentiate between them. According to descriptions, *C. virosa* has not a fasciculate root, and its umbels are larger in every way and much denser.

PART USED AND PREPARATION.—The fresh roots, chopped and pounded to a pulp, are treated as in the preceding drug. The resulting tincture has a clear yellowish-amber color by transmitted light, the peculiar odor of the fresh root, a sweetish taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—Dr. Bigelow's examination of the root is the only attempt so far made toward an analysis; he procured a volatile oil and a yellow, inflammable resin. Mr. J. E. Young succeeded in obtaining a volatile alkaloid from the fruits, which he regarded as identical with *conia*. A glance, however, at the chemistry of *C. virosa* will not be out of place here:

Cicutina.—This volatile alkaloid found in all parts of the plant by Wittstein, Polex, and others, remains as yet very imperfectly investigated; it is simply mentioned by Wittstein as having been obtained in an aqueous solution.

Oil of Cumin.—This compound of several hydrocarbons, first obtained from the fruit of *Cuminum cyminum*, Linn., is proven by Trapp to be identical with the oil of this species. Two of the hydrocarbons are identified as follows: *Cicuten*, $C_{10}H_{16}$ (Van Ankum), boils at 166° (330.8° F.), is dextrogyrate, sp. gr. at 18° (64.4° F.), 0.87038, and is soluble in alcohol, ether, and chloroform; *Cymol*, $C_{10}H_{14}$, a colorless oil of great refractory power and the odor of lemons, having a sp. gr. at 15° (59° F.) of 0.86, and a boiling point at 172° (341.6° F.).

Cicutoxin.—This amorphous, resinous body, in all probability identical with that found by Bigelow in the root-juice of *C. maculata*, was isolated and named by Trojanowski.

PHYSIOLOGICAL ACTION.—Many cases of poisoning from the root of this species have been reported, all showing, by the symptoms, that cicuta produces great hyperæmia of the brain and spinal cord.

The following case, reported by letter to Dr. Bigelow by Dr. R. Hazeltine (1818),* gives all the symptoms noted by observers in other cases: A boy had eaten of certain tuberous roots, gathered in a recently-ploughed field, supposing them to be artichokes, but which were identified as the roots of Cicuta maculata. His first symptom was a pain in the bowels urging him to an ineffectual attempt at stool, after which he vomited about a teacupful of what appeared to be the

* Bigelow, *Am. Med. Bot.*, vol. iii., 181.

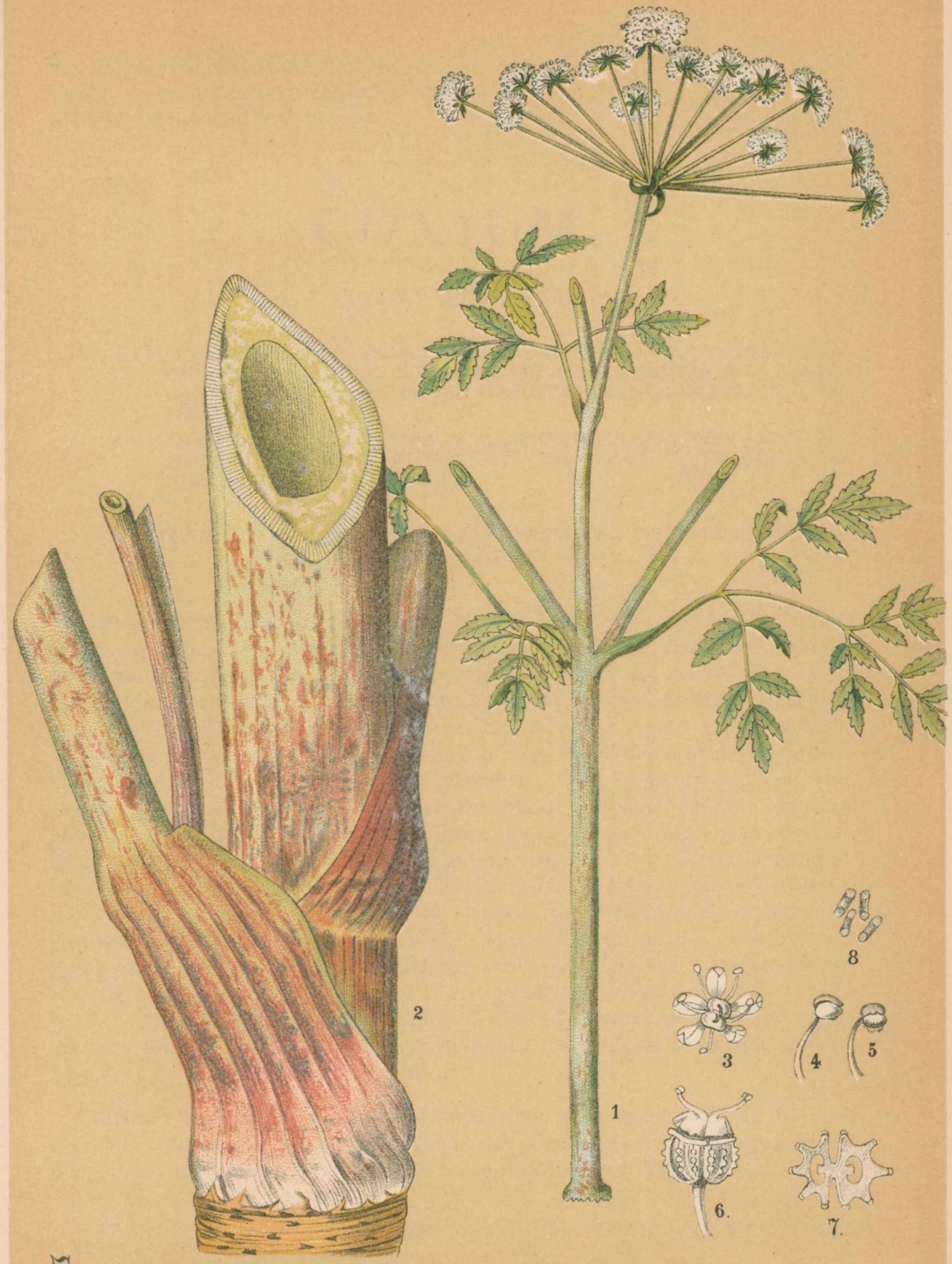
recently-masticated root, and immediately fell back into convulsions which lasted off and on continuously until his death. The doctor found him in a profuse sweat and "convulsive agitations, consisting of tremors, violent contractions and distortions, with alternate and imperfect relaxations of the whole muscular system, astonishing mobility of the eyeballs and eyelids, with widely-dilated pupils, stridor dentium, trismus, frothing at the mouth and nose, mixed with blood, and occasionally violent and genuine epilepsy." The convulsive agitations were so powerful and incessant, that the doctor "could not examine the pulse with sufficient constancy to ascertain its character." At the post-mortem no inflammation was observed, the stomach was fully distended with flatus, and contained "about three gills of a muciform and greenish fluid, such as had flowed from the mouth; this mass assumed a dark green color on standing."

DESCRIPTION OF PLATE 67.

Part of flowering branch, Binghamton, N. Y., July 2d, 1885.

2. Leaf.
3. Flower, showing calyx.
4. Face of flower.
5. Petal.
6. Pistil and calyx.
7. Stamens.

(3–7 enlarged.)



Fm. ad nat. del. et pinxt.

CONIUM MACULÀTUM, Linn.

GENUS.—**CONIUM**,* LINN.

SEX. SYST.—PENTANDRIA DIGYNIA.

CONIUM.

POISON HEMLOCK.

SYN.—CONIUM MACULATUM, LINN.; C. MAJOR, BAUH.; CORIANDRUM CICUTA, CRANTZ.; C. MACULATUM. ROTH.; CICUTA MACULATA, LAM. (not Linn.); C. VULGARIS MAJOR, PARK.; CICUTARIA VULGARIS, CLUS.

COM. NAMES.—WILD OR POISON HEMLOCK, STINK-WEED,† SPOTTED POISON PARSLEY, HERB-BENNET; (FR.) GRAND CIQUE, CIQUE ORDINAIRE; (GER.) SCHIERLING.

A TINCTURE OF THE FRESH PLANT, EXCLUDING THE ROOT, OF CONIUM MACULATUM, L.

Description.—This large, unsavory, biennial herb, grows to a height varying from 2 to 6 feet. *Root* fusiform, sometimes forked. *Stem* erect, hollow, smooth, and striate, stout below, corymbosely branching above, the whole dotted and splashed with crimson beneath the white, pulverent, easily detached coating that pervades the whole plant except the leaves and flowers. *Leaves* generally large, decompound, somewhat deltoid in outline; *common petioles* with broad striate sheathing bases; *segments* lanceolate pinnatifid; *lobes* bright green, acute and regularly serrate. *Inflorescence* terminal, flat-topped, compound umbels; *involucre* about 3-leaved; *leaves* lanceolate, acuminate, deflexed; *involucels* about 5-leaved, shorter than the umbellets, and situated to the outside of them; *leaves* lanceolate; *rays* numerous, straight; *flowers* small, white. *Petals* obtuse or somewhat obcordate, the apices incurved. *Calyx teeth* obsolete, the limb forming a thickened crowning ring in fruit. *Stamens* but slightly longer than the petals; *anthers* white. *Fruit* orate, turgid, laterally flattened, the crown retaining the divergent styles, each of which, together with its dilated base, greatly resembles the depicted headgear of the mediæval court jester. *Carpels* with 5 prominent, nearly equal, papillose ribs, the lateral ones marginal; *vittæ* none; *seed* with its inner face marked by a deep and narrow longitudinal sulcus.

History and Habitat.—Conium is indigenous to Europe and Asia. It, however, has become thoroughly naturalized in this country, where it grows in waste places, usually by river-sides. It blossoms during July and August.

---

* Κώνειον, *koneion*; from κώνος, *konos*, a top, judged by Hooker to be so named on account of the whirling vertigo caused by the poison.

† A name more commonly applied to *Datura Stramonium*.

The history of this fetid, poisonous plant, dates back to about the fifth century before Christ. From the careful observations of many pharmacographists and historians, there seems little doubt that the Grecian State potion used at Athens as a mode of execution of those condemned to death by the tribunal of Areopagus, was principally, if not wholly, composed of the fresh juice of the leaves and green seeds of this plant. It is the *κώνειον* which destroyed Thermanes, one of the thirty, Phocion, and Socrates, whose disciple he had been. Plato, in describing the potion, does not give it a specific name, nor mention its source, but terms the potion *φαρμακον*, which means any strong drug, and not necessarily a poisonous one. In the writings of Eratosthenes also, it appears that the words *κινειν κωνειον* mean to drink poison, and *κωνειον πεπωκοτα*, having drunk poison. Ælian states that Cean old men, who, when they had become useless to the State, and tired of the infirmities of life, invited each other to a banquet, after which they drank *κωνειον* and died together. Although none of these accounts give the derivation of the potion, and notwithstanding the fact that Dioscorides' description of the plant is too general to distinguish the umbelliferous species he refers to, yet there are important reasons why we should feel perfectly satisfied that the Grecian *κωνειον* was the Conium of our materia medica: first, Sibthorp says * that Conium grows plentifully between Athens and Magara, and that no other plant of near so violent qualities grows in Greece; secondly, *Cicuta virosa*—supposed, by those who doubt Conium being the origin of the potion, to be the *κωνειον*—does not grow in Greece. The cicuta of later writers, is a Latin name, applied by the Romans to any and all poisonous umbelliferæ, and even to other widely separate toxic plants; this term was unknown to the Greeks; thirdly, Dr. J. H. Bennett's case of poisoning by Conium gave symptoms almost identical with those given in the description of the death of Socrates; fourthly, later provings of Conium on man and animals, all point to it as being answerable to the symptoms mentioned. Cicuta causes convulsions even to opisthotonos, and sudden stiffness and immobility of the limbs; while Conium causes creeping muscular paralysis, with mayhap slight trembling, but no spasm; lastly, the words of the man who prepared the potion: "We only *bruise* as much as is barely sufficient for the purpose," would seem to indicate a simple; a man who spoke so clearly and definitely would hardly have used the word "bruise" had opium been added to the preparation, as some of the upholders of Cicuta claim, in trying to explain why spasms did not occur in this case.

The first use of Conium in medicine is that of Dioscorides, who used it as a collyrium mixed with wine, and as a cataplasm in herpes and erysipelas. Pliny states † that the leaves keep down all tumors; and Anaxilaus claims that by anointing the mammæ they ceased to grow. Avicenna ‡ praised it as an agent for the cure of tumors of the breasts. It remained, however, for Baron Störck (1760) to introduce Conium into more general use; he found it effectual in curing scirrhus, ulcers, cancer, and many other chronic forms of disease. Bayle § collected from various sources 46 cases of cancerous disease cured, and 26 ameliorated by the use of this drug. Conium has been recommended in jaundice, tic-douloureux,

---

* *Prod. Flor. Gr.*, i, 187. † *Nat. Hist.*, b. xxvi, c. 16. ‡ *Lib.* ii, 662. § *Bib. Therap.*, iii, 618.

syphilitic affections, enlargement of glands, especially those of a scrofulous nature, as a sedative in mania, chorea, epilepsy, laryngismus stridulus, pertussis, and various forms of nervous diseases.

Like all other drugs used by the dominant school of medicine then and now, many physicians failed to get any effect whatsoever from this drug in the diseases specified by Störck and others; so frequent were the failures that most careful and protracted experiments in gathering, curing, preserving, and preparing the drug were resorted to, analyses were made, essays written, and finally serious doubts expressed as to Baron Störck's cases;* without once a thought that it might be adaptability to his cases, and not pharmaceutical preparation that caused the drug to cure. It is well known to us as homœopathists that Baron Störck had a "peculiar notion" as to the adaptability of drugs to diseased conditions, a notion very like the law that guides us to-day.† I can personally testify to the cure of one well-marked case of mammary scirrhus, by Conium. The case is as follows: Mrs. B—— complained to me of having experienced, for some months past, sharp stitching pains in the left mamma, extending thence in all directions, but especially through to the shoulder-blade, and upward and outward into the axilla; these stitches would awaken her at night, causing her sleep to be interfered with seriously. On examining the breast I found the nipple retracted and surrounded by a hard nodular lump, just movable, and about the area of a silver dollar. Her mother died of "a cancer of the breast" several years before. I prescribed Conium in a potency, one dose per diem. Within six weeks the subjective symptoms entirely passed away, four months after, the "tumor" was much softer and the nipple less cupped. The remedy was then stopped, and upon examining her to-day (nearly four years after the first dose), I find no vestige of the growth whatever, the mamma appearing entirely normal.

Concerning the root of this virulent plant, Lepage‡ corroborates the assertion of Orfila, that the amount of alkaloid therein is very small; this accounts for the following experiences: Ray relates§ that Mr. Petiver ate half an ounce, and Mr. Healy four ounces without experiencing any remarkable effect. Curtis says:‖ "Mr. Alicorn assures me that he has tried this (eating the roots) in every season of the year, and in most parts of our island, without feeling any material difference; and Mr. T. Lane informs me that he also, cautiously, made some experiments of the like kind, without any inconvenience; after many successive trials, he had some of the larger roots boiled, and found them as agreeable eating at dinner with meat as carrots, which they somewhat resembled;" Mr. Steven, a Russian botanist, states that the Russian peasants eat it with impunity, and concludes that the colder the climate the less poisonous is the root. Pliny says:¶ "as for the stems and

* Woodville says (*Med. Bot.*, i, 108): "... Nay, it never succeeded so well as when under his own direction or confined to the neighborhood in which he resided, and to the practice of those physicians with whom he lived in habits of intimacy and friendship. [A base imputation, unworthy of the author.—C. F. M.] The general inefficiency of Hemlock experienced in this country, induced physicians at first to suppose that this plant, in the environs of Vienna and Berlin, differed widely from ours, and this being so stated to Dr. Störck, he sent a quantity of the extract, prepared by himself, to London, but this proved equally unsuccessful, and to differ in no respect from the English extract."

† Note also Baron Störck's use of Stramonium, as cited under that drug.

‡ *Jour. Phar. et Chim.*, 1885, 10.

§ *Phil. Trans.*, xix, 634.

‖ *Flor. Londinensis.*

¶ *Nat. Hist.*, b. 26, c. xii.

stalks, many there be who do eat it, both green and also boiled or stewed between two platters." Notwithstanding all this, many children have been poisoned from eating the roots.

Conium is officinal in the U. S. Ph., as *Abstractum Conii; Extractum Conii Alcoholicum; Extractum Conii Fluidum*, and *Tinctura Conii*. In the Eclectic Materia Medica the preparations are: *Extractum Conii Alcoholicum; Unguentum Conii* and *Emplastrum Belladonnæ Compositum.**

PART USED AND PREPARATION.—The entire fresh plant, with the exception of the root, should be gathered while the fruits are yet green, and prepared as in the preceding drug. The resulting tincture should have a clear madder color by transmitted light, and give an odor somewhat similar to that of the bruised leaves, a taste at first sweetish, then similar to the odor, and an acid reaction.

CHEMICAL CONSTITUENTS.—*Conia*,† $C_8H_{15}N$. This volatile alkaloid was discovered by Giseke in the leaves and fruit of this plant; Geiger, however, was first to purify it. Conia is a limpid, colorless, oily liquid, having the specific gravity of .89, and boiling at 163.°5 (328.°3 F.). It possesses a nauseous and sharp taste, and a disagreeable odor. It is soluble in cold water, in which solution it becomes turbid on the application of heat.

Methylconine, $C_8H_{14}NCH_3$. This alkaloid is also sometimes present in conium. It bears great resemblance to conia.

Conydrine,‡ $C_8H_{17}ON$. A crystalline alkaloid melting at 120.°6 (249° F.), and boiling at 225° (437° F.).

Paraconine, $C_8H_{15}N$. This fourth alkaloid, isomeric with conia, differs from it only in being atertiary base devoid of rotary power. Paraconine is liquid, and boils at 160°–170° (320°–338° F.). (*Ut supra,* Schorlemmer.)

Oil of Conium, $C_8H_{16}N_2O$. A pale, yellow oil extracted from the seeds. This oil is also formed when nitrogen trioxide is passed into conia and the resulting liquid decomposed by water.

Conic Acid.—This body, yet uninvestigated, exists in all parts of the plant and holds in solution the alkaloids present.

PHYSIOLOGICAL ACTION.—No more fitting introduction to the action of this virulent spinal irritant could be written than the description, in Plato's "Phædo," of the death of Socrates: "And Crito, hearing this, gave the sign to the boy who stood near; and the boy departing, after some time returned, bringing with him the man who was to administer the poison, who brought it ready bruised in a cup. And Socrates, beholding the man, said: 'Good friend, come hither; you are experienced in these affairs—what is to be done?' 'Nothing,' replied the man, 'only when you have drank the poison you are to walk about until a heaviness takes

---

* Rosin, Belladonna, Conium, and Iodine.

† Conine, Conicina, Conein, Coniin, Conicin.

‡ Conydrina, Conhydria, Conhydrin.

place in your legs; then lie down—this is all you have to do.' At the same time he presented the cup. Socrates received it from him with great calmness, without fear or change of countenance, and regarding the man with his usual stern aspect he asked: 'What say you of this potion? Is it lawful to sprinkle any portion of it on the earth, as a libation, or not?' 'We only bruise,' said the man, 'as much as is barely sufficient for the purpose.' 'I understand you,' said Socrates; 'but it is certainly lawful and proper to pray the gods that my departure from hence may be prosperous and happy, which I indeed beseech them to grant.' So saying, he carried the cup to his mouth, and drank it with great promptness and facility.

"Thus far most of us had been able to refrain from weeping. But when we saw that he was drinking, and actually had drank the poison, we could no longer restrain our tears. And from me they broke forth with such violence that I covered my face and deplored my wretchedness. I did not weep for his fate so much as for the loss of a friend and benefactor, which I was about to sustain. But Crito, unable to restrain his tears, now broke forth in loud lamentations, which infected all who were present, except Socrates. But he observing us, exclaimed, 'What is it you do, my excellent friends? I have sent away the women that they might not betray such weakness. I have heard that it is our duty to die cheerfully, and with expressions of joy and praise. Be silent, therefore, and let your fortitude be seen.' At this address we blushed, and suppressed our tears. But Socrates, after walking about, now told us that his legs were beginning to grow heavy, and immediately lay down, for so he had been ordered. At the same time the man who had given him the poison examined his feet and legs, touching them at intervals. At length he pressed violently upon his foot, and asked if he felt it. To which Socrates replied that he did not. The man then pressed his legs and so on, showing us that he was becoming cold and stiff. And Socrates, feeling it himself, assured us that when the effects had ascended to his heart, he should be gone. And now the middle of his body growing cold, he threw aside his clothes, and spoke for the last time: 'Crito, we owe the sacrifice of a cock to Æsculapius. Discharge this, and neglect it not.' 'It shall be done,' said Crito; 'have you anything else to say?' He made no reply, but a moment after moved, and his eyes became fixed. And Crito, seeing this, closed his eyelids and mouth."

Another case very similar to this was met with by Dr. J. H. Bennett.* A man ate a large quantity of Hemlock plant by mistake for parsley; soon afterwards there was a loss of power in the lower extremities, but he apparently suffered no pain. In walking he staggered as if he was drunk; at length his limbs refused to support him, and he fell. On being raised, his legs dragged after him, or when his arms were lifted they fell like inert masses, and remained immovable; there was perfect paralysis of the upper and lower extremities within two hours after he had taken the poison. There was a loss of power of deglutition, and a partial paralysis of sensation, but no convulsions, only slight occasional motions of the left leg; the pupils were fixed. Three hours after eating the hemlock the respiratory movements had ceased. Death took place in three and one-quarter hours. It

* *Med. and Surg. Jour. Edin.*, 1845, 169.

was evidently caused by gradual asphyxia from paralysis of the muscles of respiration, but the intellect was perfectly clear until shortly before death.

The sequence of symptoms would seem to show in all of the many cases of poisoning by this plant that the drug acts primarily upon the spinal cord, causing a paralysis first of the anterior then posterior branches, and that from below upward until the medulla is reached.

On Animals.—Linnæus states that sheep will eat of the leaves, but horses and goats refuse them. Ray says that the thrush will feed upon the seeds, even when grain is plenty. Orfila* found that the powder and extract were generally harmless when given to animals, but that the juice or leaves of the fresh plant produced the most violent symptoms and death. Moiroud† gave a decoction of four ounces of the dried plant to a horse which had eaten three and a half pounds of the plant without effect. It caused dejection, stupor, dilation of the pupils, trembling, spasmodic trembling of muscles, grinding of teeth and copious sweats. It would seem, from experiments upon animals, that Conium is more poisonous to carnivora than to graminivora.

Post-mortem.—In Dr. Bennett's case, there was slight serous effusion beneath the arachnoid membrane. The substance of the brain was soft on section; there were numerous bloody points, but the organ was otherwise healthy. The lungs were engorged with dark-red fluid blood; the heart was soft and flabby. The mucous coat of the stomach, that contained a green, pultaceous mass of the herb, was much congested, especially at the cardiac extremity; here there were numerous extravasations of dark blood below the epithelium, over a space about the size of the hand. The intestines presented patches of congestion on the mucous coat. The blood throughout the body was fluid and of a dark color.

DESCRIPTION OF PLATE 68.

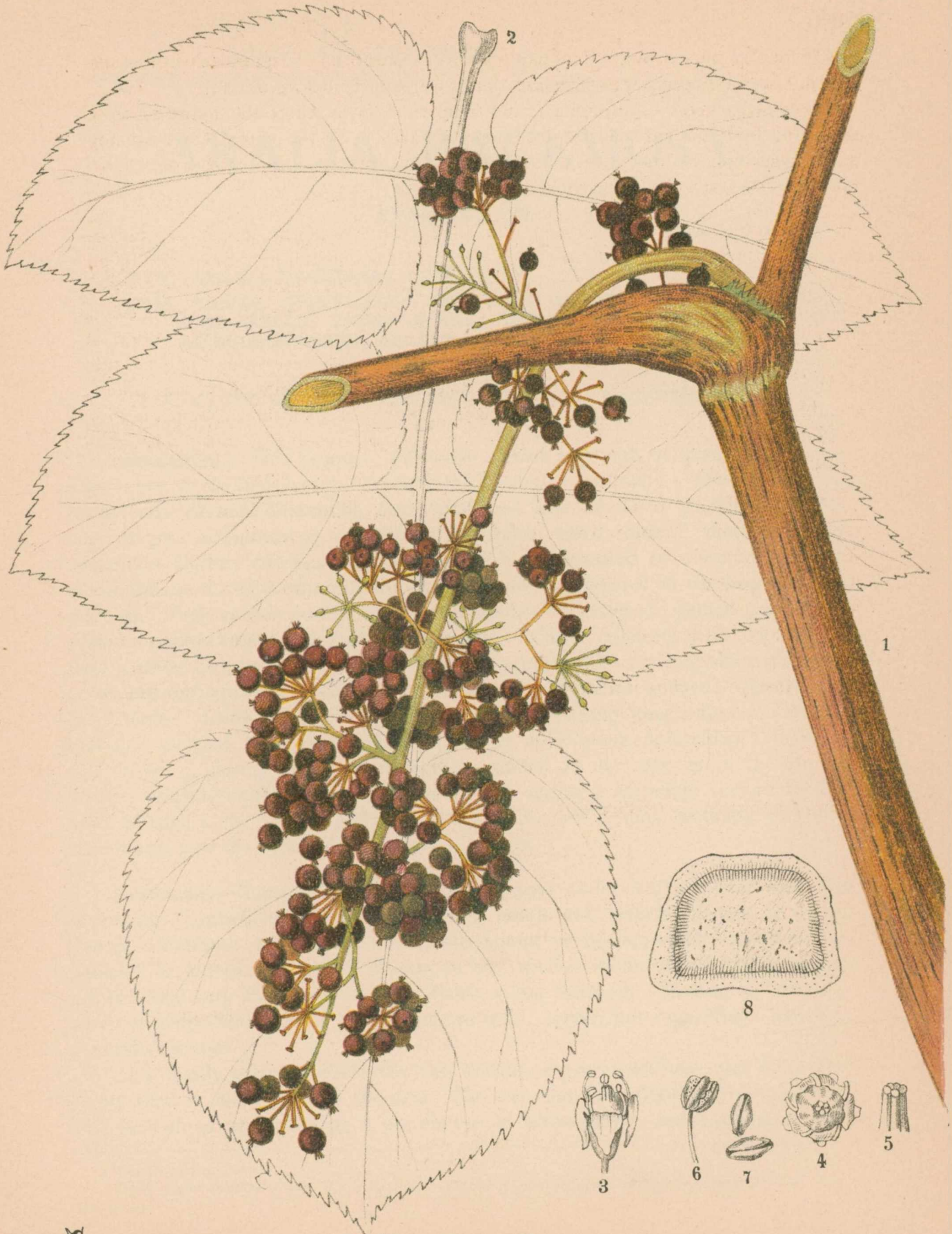
1. Top of a flowering branch divested of three of its umbels, Binghamton, N. Y., June 29th, 1884.
2. Stalk at the root.
3. Flower.
4 and 5. Stamens.
6. Young fruit.
7. Section of ovary.
8. Pollen, x 250.

(3–6 enlarged.)

---

* *Tox. Gén.*, ii, 309.

† *Pharm. Vét.*, 359.



F.M. ad nat del. et pinxt.

ARÀLIA RACEMÒSA Linn.

GENUS.—**ARALIA,*** TOURN.

SEX. SYST.—PENTANDRIA PENTAGYNIA.

ARALIA RACEMOSA.

SPIKENARD.

SYN.—ARALIA RACEMOSA, LINN.

COM. NAMES.—SPIKENARD, AMERICAN SPIKENARD, PETTYMORREL, LIFE-OF-MAN, PIGEON-WEED; (FR.) NARD D'AMERIQUE; (GER.) AMERIKANISCHER ARALIE.

A TINCTURE OF THE FRESH ROOT OF ARALIA RACEMOSA, LINN.

Description.—This aromatic perennial attains a growth of from 2 to 5 feet.† *Root* large, thick, spicy-aromatic; *bark* thick, whitish internally. *Stem* ligneously herbaceous, smooth, bifurcating, much branched, and devoid of prickles. *Leaves* very large, odd-pinnately compound; *leaflets* ovate-cordate, doubly-serrate, acuminate, slightly downy; *stipules* wanting, or represented by a serrate stipular membrane at the bifurcation of the branches and sometimes at the bases of the petioles. *Inflorescence* numerous axillary, compound, racemose panicles, or thyrsi. *Flowers* monœciously polygamous or perfect. *Calyx* coherent with the ovary; *teeth* 5, short, projecting upward between the petals. *Petals* 5, epigynous, obovate acute, reflexed-spreading, caducous. *Stamens* 5, epigynous, situated opposite the calyx teeth; *filaments* slender; *anthers* 2-celled, opening longitudinally. *Ovary* globular, 5-celled, somewhat 10-ridged; *ovules* anatropous, suspended, 1 in each cell; *styles* 5, closely clustered, sometimes united at the base, or in the sterile flowers entirely united; *stigmas* capitellate, or simply a stigmatic surface to the apex of each style. *Fruit* globular, aromatic, baccate drupes, retaining the persistent and now divaricate styles; *embryo* minute.

Araliaceæ.—Many characters of this natural order are identical with the preceding (Umbelliferæ), its distinguishing points are: Herbs, shrubs, or trees. *Leaves* sometimes simple but mostly compound or decompound. *Inflorescence* panicled or racemose umbels; *flowers* in our species more or less polygamous. *Calyx: limb* very short or wanting. *Petals* 5, not inflexed. *Stamens* 5. *Fruit* a berry or drupe with usually more than two cells; *carpels* not separating; *albumen* generally sarcous.

This family affords, beside the two species represented here, the following plants used in medicine and the arts: The common Ivy (*Hedera Helix*), at one time held in great repute as a preventive of drunkenness and antidote to the

* Derivation unknown.

† J. F. James mentions a plant 7 to 8 feet high, with leaves 3 feet long, and fruit 15 to 18 inches, in *Bot. Gaz.*, 1882, p. 122.

effects of "heady" wines; its blackish, gummy resin is used as a constituent of some varnishes (Griffith); the Amboyian *Hedera umbellifera* (*Aralia umbellifera*, Lam.) yields a powerfully aromatic camphoraceous resin; and the Ceylon *H. terebinthacea* one resembling turpentine. The American aromatic tonics False Sarsaparilla (*Aralia nudicaulis*) and the Angelica tree (*A. spinosa*) have just been dismissed from the Pharmacopœia of the United States. Among the edible plants of this family are the Chinese *Diamorphantus edulis*, *Gunnera scabra*, and *G. macrocephala*. The useful species of *Panax* are noted under the next drug.

History and Habitat.—Spikenard is indigenous to Canada, and the United States southward to the mountains of South Carolina and westward to the Rockies. It grows along the rocky but rich banks of well shaded streams, and flowers in July.

Concerning the previous use of this species, which was not so extensive as that of *A. spinosa*, *nudicaulis*, and *hispida*, Rafinesque says:* "*A. racemosa* is used by the Indians as carminative, pectoral and antiseptic, in coughs, pains in the breast (chest), and mortification; the root with horse-radish is made in poultice for the feet in general dropsy. The juice of the berries and oil of the seeds is said to cure ear-ache and deafness, poured in the ears." Culpepper says:† "It is good to provoke urine, and cureth the pains of the stone in the reins and kidneys." In domestic practice it has been made into a composite syrup with the root of *Inula helenium*, and used as a remedy in chronic coughs, asthma, and rheumatism; a tincture of the root and fruit has also been used as a stomachic.

No preparation of this plant is now officinal in the U. S. Ph. or Eclectic Materia Medica.

PART USED AND PREPARATION.—The fresh root, the part used is large and thick, the bark is about $\frac{3}{16}$ inch in thickness, white internally and shows on section, many yellow resin cells, it readily peels off the ligneous layer surrounding the main bulk of the root. The central portion is somewhat dense, dotted with scattered bundles of woody fibre and surrounded by a ligneous sheath $\frac{1}{16}$ inch thick.

The tincture is prepared by chopping and pounding the root to a pulp, macerating it for eight days in two parts by weight of alcohol and filtering. It results as a clear, slightly brownish-orange liquid by transmitted light, having the peculiar, somewhat terebinthic odor of the root, a bitter astringent taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—No analysis of this plant has been published as far as I can determine. The analysis of *A. spinosa*, by Holden,‡ Elkins,§ and Lilly,‖ will give us some idea of the probable nature of the phytochemistry of this species.

---

* *Med. Flor.*, vol. 2, p. 175.

† *Complete Herbal*, London, 1819.

‡ *Am. Jour. Phar.*, 1880, p. 390.

§ *Idem*, p. 402.

‖ *Period. cit.*, 1882, p. 433.

Araliin.—This *saponin*-like glucoside was discovered by Holden and purified by Lilly. It results as a slightly acrid, inodorous, whitish powder; soluble in water, insoluble in cold, strong alcohol, ether, and chloroform. Its watery solution yields a dense, persistent froth on agitation. It precipitates whiter from its solution in boiling alcohol when cold. Boiled with very dilute hydrochloric acid, it breaks down into glucose and *Araliretin* (Holden), a white, insoluble, tasteless and odorless, amorphous product.

Alkaloid.—Elkin announced an alkaloid principle separable as a yellowish, amorphous, semi-transparent, bitter mass, soluble in water and ether, and answering to Mayer's test. Lilly failed to procure this precipitable body, but isolated a "bitter principle" having all its characteristics except that it was crystalline.

Oil of Aralia (Elkins, Lilly).—An aromatic, somewhatc amphoraceous, acid body, having the characteristic odor of the root.

An acrid resin, soluble in alcohol and ether, insoluble in water;*† tannin;* glucose;†‡ pictin;†‡ gum;† fat;* and starch,†‡ were also determined.

PHYSIOLOGICAL ACTION.—The only account of the action of this drug that we have, is a proving by Dr. Sam'l A. Jones, of Ann Arbor, § in whom a dose of 10 drops of the tincture caused a severe asthmatic fit, characterized by dry, wheezing respiration; obstructed inspiration; a sense of impending suffocation and inability to lie down during the attack; profuse night sweat during sleep; nausea; prostration; and difficult expulsion of small, soft stool, accompanied by the abdominal sense of oncoming diarrhœa. I have had the pleasure of seeing drop doses of the tincture promptly relieve a similar case, in my own practice, in a half hour, and exert a beneficial effect in warding off recurring attacks.

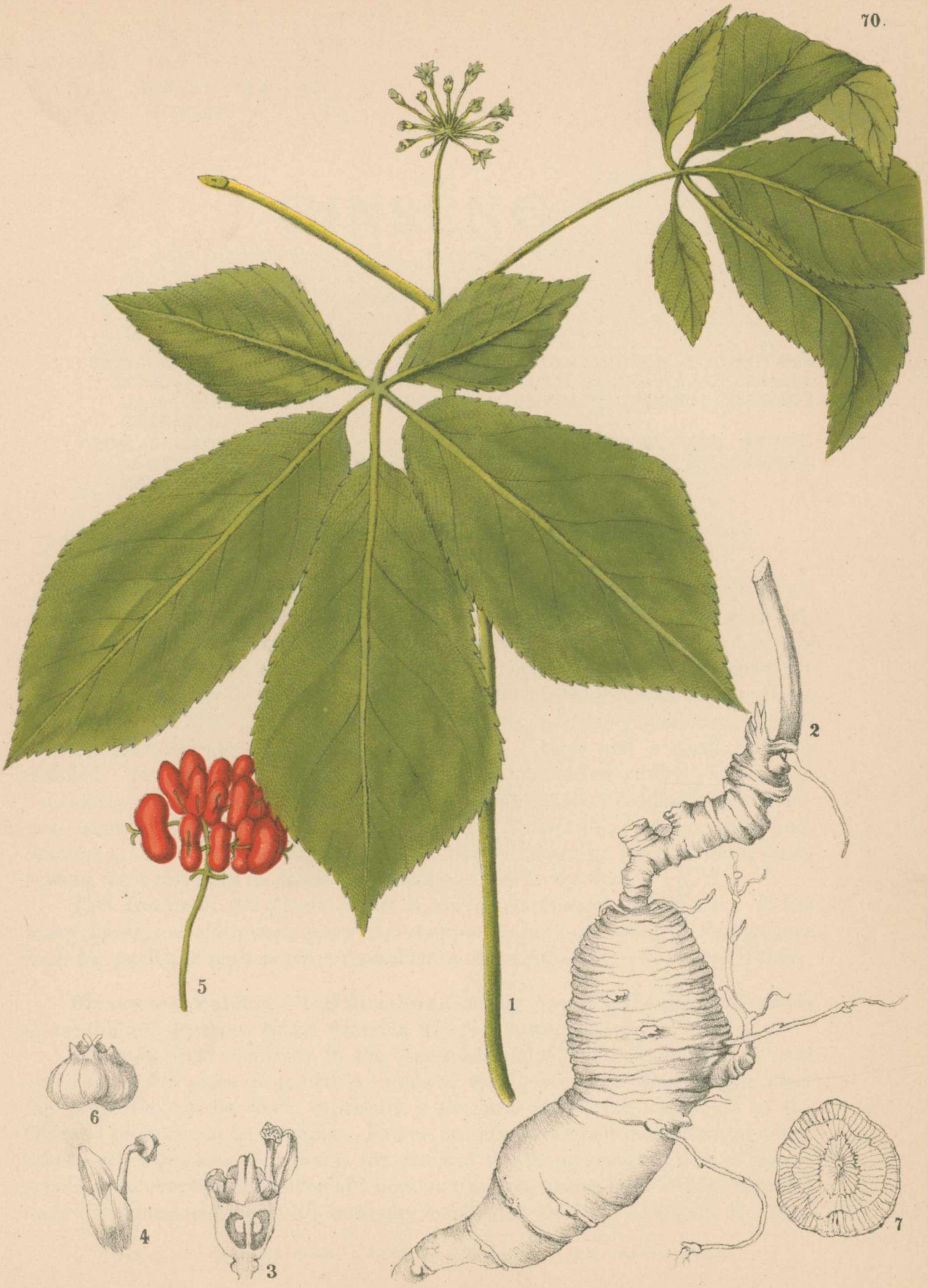
DESCRIPTION OF PLATE 69.

1. Portion of a fruiting stem, Binghamton, N. Y., Oct. 12, 1882.
2. A leaf, half natural size.
3. A flower.
4. Bird's-eye view of flower after removal of the anthers.
5. Styles.
6. Stamen.
7. Pollen x 300.
8. Section of the root.

(3–6 enlarged.)

---

* Holden, *loc. cit.* † Elkins, *loc. cit.* ‡ Lilly, *loc. cit.* § Hale's *New Remedies*, p. 53.



Fm. ad nat. del. et pinxt.

ARÀLIA QUINQUEFÒLIA, Gray.

GINSENG.

JIN-CHEN.

SYN.—ARALIA QUINQUEFOLIA, GRAY; A. CANADENSIS, TOURN.; PANAX QUINQUEFOLIUM, LINN.; P. AMERICANUM, RAF.; AURELIANA CANADENSIS, LAFIT; GINSENG QUINQUEFOLIUM, WOOD; GIN-SENG CHINENSIBUS, JARTOUX.

COM. NAMES.—GINSENG, TARTAR-ROOT, FIVE-FINGER, RED BERRY, MAN'S HEALTH; (FR.) GINSENG D'AMERIQUE; (GER.) KRAFTWURZEL.

A TINCTURE OF THE DRY ROOT OF ARALIA QUINQUEFOLIA, GRAY.

Description.—This herbaceous perennial grows to a height of about 1 foot. *Root* large, sometimes forked, but generally consisting of a fleshy, somewhat fusiform body, from the larger end of which is given off an irregular, cylindrical, knotty portion, narrower at its abrupt juncture with the main root, and showing the scars of previous stem-growths. Both parts are transversely wrinkled, closely above and sparsely below. *Stem* simple, erect; *leaves* 3, palmately 5-divided; *leaflets* obovate, thin, serrate, and pointed, in two sets, 3 large and 2 small, all long petioled. *Inflorescence* a single terminal, naked, peduncled umbel; *flowers* few, dicœciously-polygamous. *Calyx-limb* very short, obscurely 5-toothed; *teeth* triangular acute. *Petals* 5, spreading, ovate-oblong. *Styles* 2 to 3, erect or spreading. *Stamens* 5. *Fruit* a cluster of bright-red, 2-celled, more or less reniform, fleshy berries, each retaining its calyx-limb and styles; *endocarp* thin.

This portion of the genus Aralia is the genus *Panax** of Linnæus. It has many characters, which have given rise to opportunities for forming distinct genera from its species, though its close resemblance to the Aralias serves to hold it there.

History and Habitat.—The American Ginseng grows in the rich, cool woods of central and northern North America, where it flowers in July.

There is great similarity in the American and Chinese individuals of this species, but the place of growth or mode of drying seems to more or less affect the properties of the roots, especially if the accounts of the usefulness of the Oriental product can be credited. Father Jartoux, who spent much time, and had special privileges accorded him in the study of this plant, remarks, that so high is it held in esteem by the natives of China that the physicians have written volumes upon its virtues, and deem it a necessity in all their best prescriptions, ascribing

* Πανν, *pan*, all; ακος, *akos*, a remedy; as the Chinese and Tartar species were considered panaceas.

to it medicinal properties of inestimable value, and a remedial agency in fatigue and the infirmities of old age. So great is the plant esteemed in China that the Emperor monopolizes the right of gathering its roots. The preparation of the best roots for the Chinese market is a process which renders them yellow, semi-transparent, and of a horny appearance; this condition is gained by first plunging them in hot water, brushing until thoroughly scoured, and steaming over boiling millet seed. The root thus prepared is chewed by the sick to recover health, and by the healthy to increase their vitality; it is said that it removes both mental and bodily fatigue, cures pulmonary complaints, dissolves humors, and prolongs life to a ripe old age,—for all of which the root has often brought in the markets ten times its weight in silver. Father Jartoux* finally became so satisfied that the use of the root verified all that was said of its virtues, that he, in his own case, adds testimony as to its relief of fatigue and increase of vitality. Those roots that are bifurcated are held by the natives to be the most powerful; it was to this kind—which they considered to resemble the human form—that they gave the name *Jin-chen, like a man.* Strange as it may seem, the American Indian name of the plant, *garant-oquen*, means the same.

The plant is becoming rare in this country, and in fact wherever it is found, on account of the value it brings in the markets. In 1718 the Jesuits of Canada began shipping the roots to China; in 1748 they sold at a dollar a pound here and nearly five in China; afterward the price fluctuated greatly on account of a dislike in China of our product; and finally its gathering has nearly ceased, though fine sun-dried roots will now bring nearly a dollar per pound at New York.

Panax was dismissed from the U. S. Ph. at the last revision, and is simply mentioned in the Eclectic Materia Medica.

PART USED AND PREPARATION.—The genuine Chinese or the American root, dried and coarsely powdered, is covered with five times its weight of alcohol, and allowed to stand eight days, in a well-stoppered bottle, in a dark, cool place, being shaken twice a day. The tincture, poured off and filtered, has a clear, light-lemon color by transmitted light, an odor like the root, a taste at first bitter then dulcamarous, and an acid reaction.

CHEMICAL CONSTITUENTS.—Panaquilon, $C_{12}H_{25}O_9$.—This peculiar body, having a taste much like *glycyrrhizin* but more amarous, may be extracted from the root. It results as an amorphous, yellowish powder, soluble in water and alcohol, but not in ether, and precipitable by tannin. It breaks down under the action of sulphuric acid, which, in extracting three molecules of water, causes it to give off carbonic dioxide and yield a new body as follows:

$$\underset{\text{Panaquilon.}}{C_{12}H_{25}O_9} = CO_2 + (H_2O)_3 + \underset{\text{Panacon.}}{C_{11}H_{10}O_4}.$$

PHYSIOLOGICAL ACTION.—Ginseng causes vertigo, dryness of the mucous membranes of the mouth and throat, increased appetite, accumulation of flatus

* *Phil. Trans.*, 28, 239.

with tension of the abdomen, diarrhœa, decreased secretion of urine, sexual excitement, oppression of the chest and a dry cough, increased heart's action and irregular pulse, weakness and weariness of the limbs, increased general strength, followed by weakness and prostration, somnolence, and much chilliness.

DESCRIPTION OF PLATE 70.

1 and 2. Whole plant, Pittsburgh, Pa., June 28th, 1885.
3. Section of flower.
4. Part of calyx, a petal and stamen.
5 and 6. Fruit.
7. Section of rhizome.
(3, 4, and 6 enlarged.)

Fm. ad nat. del. et pinxt.

CÓRNUS FLÓRIDA, Linn.

GENUS—**CORNUS**,* TOURN.

SEX. SYST.—TETRANDRIA MONOGYNIA.

CORNUS FLORIDA.

FLOWERING DOGWOOD.

SYN.—CORNUS FLORIDA, LINN.; BENTHAMIDIA FLORIDA, SPACH.

COM. NAMES.—FLOWERING DOGWOOD, DOG TREE, BOX TREE, NEW ENGLAND BOXWOOD, CORNEL, BITTER REDBERRY; (FR.) CORNUILLIER À GRANDES FLEURS; (GER.) GROSSBLÜTHIGE CORNEL.

A TINCTURE OF THE FRESH BARK OF CORNUS FLORIDA, LINN.

Description.—This small but beautiful forest tree, grows to a height of from 10 to 30 feet; its form is usually somewhat bent, scraggy, and loosely branched; but if transplanted when young to open places, it grows into a beautiful full, umbrella-like tree, with an immense spread of branches. *Bark* greyish, cracked into small, more or less rectangular pieces; that of the branches is smooth, red, and shows strongly the scars of previous leaves. *Inflorescence* terminal, peduncled, involucrate, greenish heads; *involucre* white and showy; *lobes* 4, petaloid, obcordate or furnished with deep notches, having a discolored and thickened margin. *Flowers* perfect, appearing with the leaves; *calyx* tubular; *lobes* 4, minute, triangular and somewhat obtuse; *petals* 4, oblong, obtuse, spreading, but at length recurved in such a manner as to cause each flower, when magnified, to bear great resemblance to a plain Ionic capital. *Stamens* 4, erect; *filaments* slender and filiform; *anthers* oval, versatile, 2-celled. *Style* erect, slender, clavate, shorter than the stamens; *stigma* terminal, obtuse. *Fruit* a few oval, red drupes, containing each a 2-celled and 2-seeded nutlet.

Cornaceæ.—This small order is composed of shrubs or trees (rarely herbs) having the following characters: *Leaves* mostly opposite, rarely alternate; *stipules* none. *Inflorescence* cymose, or (in two species of Cornus) capitate and subtended by a showy, white involucre; *flowers* perfect or polygamous. *Calyx* tubular and coherent with the ovary; *limb* minute, 4-toothed. *Petals* valvate in the bud, equal in number to the calyx teeth or sometimes wanting. *Stamens* as many as the petals and alternate with them; in the perfect flowers they are borne on the margin of an epigynous disk; *filaments* usually ascending, sometimes erect. *Ovary* 1 to 2-celled; *ovules* one in each cell, anatropous, hanging from the apex of its cell; *styles* united into one. *Fruit* a 1 to 2-seeded drupe; *seeds* oval; *testa* coriaceous; *albumen* sarcous; *embryo* axial, nearly the length of the albumen; *cotyledons* foliaceous.

---

* *Cornu*, a horn, alluding to the density of the wood.

This family is represented by only two genera, *Cornus* and *Nyssa*, the latter having dicœcious and partly apetalous flowers.

Beside the three species treated of in this work, the following are useful: The European and Asiatic Cornellian Cherry (*Cornus mas*, Linn.), the fruits of which were formerly fermented as a beverage, and are now used in Turkey in the concoction of a kind of sherbet; and the North European *Lus-a-chrasis* (*C. succica*, Linn.), the berries of which are claimed by the Highlanders to have the power of enormously increasing the appetite. The berries of the Red Osier Dogwood (*C. stolonifera*, Michx.; *C. sanguinea*, Linn.), are claimed by Murion* to yield about one-third their weight of a pure, limpid oil, resembling olive, and fit for table use or for burning.

History and Habitat.—The flowering dogwood is common in the deep woods of North America from the 43° north latitude southward, eastward, and westward; it is especially common in the South, where it extends from Florida westward to the Mississippi. Its principal central localities are the States of New Jersey, Pennsylvania, Maryland, and Virginia, where it flowers in May, generally from the 15th to the 22d, and fruits in September. A peculiar feature in the blossoming of this species is the great regularity in time of appearance of its short-lived blossoms; so characteristic is this that the Indians always planted their corn when the blossoms appeared.

Notwithstanding the small diameter of the trunk of the dogwood, its wood is nevertheless quite valuable, on account of its great density and susceptibility of polish. It has been used for every purpose generally filled by the European Boxwood, such as engravers' blocks, cog-wheels, forks, spoons, rules, etc., etc. The twigs have long been used as a dentifrice; of this use Barton says: † "The young branches stripped of their bark, and rubbed with their ends against the teeth, render them extremely white. The Creole negroes, who inhabit Norfolk, in Virginia, in great numbers, are in constant practice of using dogwood twigs in cleansing their teeth; the striking whiteness of these, which I have frequently observed, is a proof of the efficacy of this practice. The application of the juice of these twigs to the gums, is also useful in preserving them hard and sound." The bark of the root afforded the aborigines a scarlet pigment.

The previous medicinal use of dogwood bark dates from the discovery of this country, as it was then used by the Indians, who called the tree *Mon-ha-can-ni-min-schi*, or *Hat-ta-wa-no-min-schi* by the Delawares. The bark has proven tonic, astringent, and slightly stimulating; being a stomachic tonic and anti-periodic, said to possess an action very like that of Peruvian bark, and differing from the latter only in quantity of action. Eberle states ‡ that 35 grains equal 30 grains of cinchona bark, and Barton says,§ "It may be asserted with entire safety, that as yet there has not been discovered within the limits of the United States any vegetable so effectually to answer the purpose of Peruvian bark in the management of intermittent fever as *Cornus florida*." The dose of the dried and powdered

---

* *Jour. de Pharm.*, 10. † *Med. Bot.*, i., 55. ‡ *Therapeutics*, i., 304. § *Collections.*

bark is placed at from 20 to 30 grains, and caution is necessary against its being too fresh, as it then disagrees seriously with the stomach and bowels. The bark is also considered a tonic, stimulant, and antiseptic poultice for indolent ulcers, phlegmonous erysipelas, and anthrax.

The officinal preparation of the U. S. Ph. is *Extractum Cornus Fluidum;* in the Eclectic Materia Medica the preparations are: *Decoctum Cornus Floridæ*, *Extractum Cornus Floridæ*, *Extractum Cornus Floridæ Fluidum*, and *Pilulæ Quiniæ Compositæ.**

PART USED AND PREPARATION.—The fresh bark, especially that of the root, is to be chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. After having stirred the whole well, pour it into a well-stoppered bottle and allow it to remain eight days in a dark, cool place.

The tincture separated from this mass by filtration, presents a magnificent, clear, crimson color by transmitted light. It has a vinous odor, a sharply astringent cinnamon-like taste, and a strongly acid reaction.

CHEMICAL CONSTITUENTS.—*Cornic Acid.* This acid was discovered by Carpenter (1830), who judged it alkaloidal and gave it the name *Cornin.* Geiger† (1836) investigated the principle and determined it to be a crystalline acid; his observations were corroborated by Frey‡ (1879). It crystallizes in nearly white, silky forms, very bitter and soluble in alcohol and water. The crystals deliquesce when exposed to the air, and when subjected to heat upon platinum foil they melt readily, become black, and finally burst into a flame and burn without residue.

Oil of Cornus.—The ripe berries, when boiled and pressed, are said to yield a limpid oil; this body is uninvestigated.

Tannic,[1345] and gallic acid,[125] a neutral resin crystallizing in shining needles,[1234] gum,[134] extractive,[1235] fatty matter,[2] oil,[2] wax,[2] red coloring matter,[2345] cornic acid,[2345] and a bitter principle,[3] have been determined.

PHYSIOLOGICAL ACTION.—The fresh bark in doses of from 20 to 40 grains causes increased action of the heart, heat of the skin, and severe pain in the bowels. The American Indian, true to the principle that seems to have guided him in the use of all medicines, used the bark for fever and colic. The symptoms so far developed in proving are: sensations of fullness of the head with headache; nausea and vomiting; violent pain in the bowels with purging; and increased bodily temperature, followed by hot sweat.[6] Dr. Chas. A. Lee sums up the action of the drug as follows:[7] "The physiological effects of Cornus bark are: increased frequency of pulse, exalted temperature, diaphoresis, sensation of fullness or pains in the

---

* Sulphate of Quinia, extract of Cornus florida, Tartaric acid, and alcoholic extract of Cimicifuga.

† M. Geiger, *Ann. der Pharm.*, XIV., 206.

‡ *Am. Jour. Phar.*, 1879, 390.

[1] Walker, *Inaug. Diss.* [2] Cockburn, *Am. Jour. Phar.*, 1835, 114. [3] Tilden, *Jour. Mat. Med.*, i., N. S., 294.
[4] Geiger, l. c. [5] Frey, l. c. [6] Hale, *New Rem.*, 242. [7] *The Jour. of Mat. Med.*, l. c.

head, and, if the dose be too large, gastric derangement. Of these the most strongly marked are the increased temperature of the skin, and the general perspiration. Some experimenters have observed a constant tendency to sleep, which has continued for several hours. This does not indicate any specific narcotic properties, but is the result of the cerebral fullness. Whether the remote effects are owing to sympathy, propagated from the gastic centre, or are the direct effects of the introduction of the active principles into the blood, is not certainly known; although the latter is most probable, since the cold infusion or the alcoholic extract produces the same effects. But whatever doubt there may be in regard to its true mode of operation, it is very evident that the bark has properties calculated to invigorate the vital forces, and the organic nervous energy, without unduly stimulating the circulating system."

DESCRIPTION OF PLATE 71.

1. End of a flowering branch, Newfield, N. Y., May 15th, 1880.
2. Flower.
3. Section of calyx and ovary.
4. Fruiting branch.

(2 and 3 enlarged.)

F.M. ad nat del.et pinxt.

CÓRNUS CIRCINÀTA, L'Her.

CORNUS CIRCINATA.

ROUND LEAVED DOGWOOD.

SYN.—CORNUS CIRCINATA, L'HER.; C. RUGOSA, LAM.; C. TOMENTULOSA, MICHX.

COM. NAMES.—ROUND LEAVED CORNEL OR DOGWOOD, ALDER DOGWOOD, PENNSYLVANIA DOGWOOD, GREEN OSIER, SWAMP SASSAFRAS; (FR.) CORNOUILE À FEUILLES RONDIE; (GER.) RUNDBLÄTTERIGE CORNEL.

A TINCTURE OF THE FRESH BARK OF CORNUS CIRCINATA, L'HER.

Description.—This shrubby species grows from 6 to 10 feet high. *Stem* erect; *bark* greyish, verrucose; *branches* green, opposite, straight, and slender—the younger ones bright green splashed with red, those of the previous year somewhat crimson and more or less warty. *Leaves* all opposite, round-oval, acuminate, woolly beneath, larger than those of any other species; *ribs* and *veins* prominent below and correspondingly indented above. *Inflorescence* terminal, in open, more or less flat, spreading cymes; *flowers* white. *Calyx teeth* very short. *Petals* ovate-lanceolate, at length spreading. *Stamens* longer than the petals. *Style* about two-thirds the length of the stamens; *stigma* capitate. *Fruit* an incomplete cyme of spherical, light blue drupes, each hollowed at the insertion of the pedicel and where it retains the remains of the persistent style.

History and Habitat.—The Round Leaved Dogwood grows in copses where the soil is rich, being indigenous from Canada to the Carolinas, and west to the Mississippi; flowering in the north in June.

The medicinal use of this species is far less extensive than the last, preceding. The Drs. Ives claim * that the bark is tonic, and astringent to a far greater degree than any other species of the genus, and that it resembles Cinchona lancefolia (Pale Bark) in its action. It has proven, in their hands, an excellent remedy for chronic dyspepsia [*sic*] and diarrhœa. An ounce of the bark will yield in the neighborhood of 150 grains of a very strongly-bitter extract; far greater in quantity, and more bitter than that of *C. florida.*

Cornus circinata was dismissed from the U. S. Ph. at the last revision.

PART USED AND PREPARATION.—The fresh bark is gathered and treated as in the preceding species.

---

* Dr. A. W. Ives, *N. Y. Rep.*, 1822; Dr. E. Ives, *Trans. Am. Med. Assoc'n*, iii, 312.

The tincture resulting is clear, and of a slightly brownish-orange color. Its odor is very like that of Rhubarb; its taste sharply astringent and bitter, and its reaction acid.

CHEMICAL CONSTITUENTS.—*Cornin.* This acid differs from that of *C. florida* only in the fact that it remains associated with tannin in spite of most careful re-crystallization, and other means of purification.*

The other constituents mentioned in the preceding species are all, without doubt, duplicated in this. Gibson isolated sugar, coloring-matter, *cornin* and tannin.

PHYSIOLOGICAL ACTION.—Here again great similarity exists between the species. *C. circinata* causes drowsiness and depression of spirits; congestion of the head; nausea and faintness; flatulency; copious bilious stools and urine, with yellowness of the sclera, face and hands; coldness of the extremties; itching, red rash, upon the whole surface, especially the trunk, with flashes of heat and chill, followed by perspiration.

DESCRIPTION OF PLATE 72.

1. End of a flowering branch, Binghamton, N. Y., June 16th, 1885.
2. Flower.
3 and 4. Stamens.
5. Stigma.
6. Portion of the stem, showing mode of branching.
7. Part of a fruiting cyme.
8. Seed.

(2–5, and 8 enlarged.)

---

* Robert Gibson, Jr., *Am. Jour. Phar.*, 1880, 433.

F m. ad nat. del. et pinxt.

CÓRNUS SERÍCEA, Linn.

GENUS.—**CORNUS**, TOURN.

SEX. SYST.—TETRANDRIA MONOGYNIA.

CORNUS SERICEA.

SILKY DOGWOOD.

SYN.—**CORNUS SERICEA, LINN.; C. AMOMUM, DU ROI; C. CYANOCARPUS, MOEN.; C. LANUGINOSA, MICHX.; C. OBLIQUA, RAF.**

COM. NAMES.*—**SWAMP OR FEMALE DOGWOOD, SILKY OR BLUEBERRY CORNEL, KINNIKINNIK; (FR.) CORNOUILLE SOYEUX; (GER.) SUMPF-CORNEL.**

A TINCTURE OF THE FRESH BARK OF CORNUS SERICEA, LINN.

Description.—This water-loving shrub grows to a height of from 6 to 12 feet. *Branches* spreading, dark-purplish (not brilliant red); *branchlets* silky-downy. *Leaves* narrowly ovate or elliptical, pointed, smooth above, silky-downy below and often rusty-hairy upon the ribs. *Inflorescence* a flat, close, woolly-pubescent, long-peduncled cyme; *flowers* creamy-white. *Calyx teeth* lanceolate, conspicuous. *Petals* lanceolate-oblong, obtuse. *Stigma* thick, capitate. *Fruit* pale blue, globose. Read description of Cornaceæ, p. 71.

History and Habitat.—The Swamp Dogwood is indigenous to North America, from Florida to Mississippi and thence northward, where it grows in wet places, generally in company with Cephalanthus and Viburnum dentatum. It flowers northward in June, and ripens its azure fruit in September.

The use of this species in general medicine has mostly been as a substitute for *C. florida*, than which it is less bitter, while being more astringent. The Cree Indians of Hudson's Bay call the plant *Milawapamule*, and use the bark in decoction as an emetic in coughs and fevers. They also smoke the scrapings of the wood, and make a black dye from the bark by boiling it with iron rust.† A favorite tobacco mixture of the North American Indians, called *Kinnikinnik*, is composed of scrapings of the wood of this species, mixed with tobacco in the proportion of about one to four. A good scarlet dye is made by boiling the rootlets with water.

PART USED AND PREPARATION.—The fresh bark, including that of the root, is treated like that of the first-mentioned species; the resulting tincture has

* The names Red Willow, Red Osier, Red Rod, and Rose Willow, are often given to this species, but they should only designate *C. stolonifera*, Michx.

† E. M. Holmes in *Am. Jour. Phar.*, 1884, 617.

a beautiful madder color by transmitted light, an odor greatly like that of sugar-cane when the juices are slightly soured, an extremely astringent and bitterish taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—At present we can only call attention again to this rubric under *C. florida.* The bitterness, however, of this species is less than its congener, while its astringency is greater.

PHYSIOLOGICAL ACTION.—This species seems to act stronger upon the heart than *C. florida,* and to cause more cerebral congestion.

DESCRIPTION OF PLATE 73.

1. End of a flowering branch, Binghamton, N. Y., June 20th, 1885.
2. Flower.
3. Stigma.
4. Fruit.

(2 and 3 enlarged.)

Fm. ad nat. del. et. pinxt. TRIÓSTEUM PERFOLIÀTUM, Linn.

Tribe.—LONICEREÆ.

GENUS.—**TRIOSTEUM,*** LINN.

SEX. SYST.—PENTANDRIA MONOGYNIA.

TRIOSTEUM.

FEVER-WORT.

SYN.—TRIOSTEUM PERFOLIATUM, LINN.; TRIOSTEUM MAJUS, MICHX.

COM. NAMES.—FEVER-WORT, OR ROOT; HORSE-GENTIAN, OR GINSENG; WHITE GINSENG; TINKER WEED, OR DR. TINKER'S WEED; BASTARD, FALSE, OR, WILD IPECAC;† WILD COFFEE; SWEET-BITTER; CINQUE; (FR.) TRIOSTE; (GER.) DREISTEIN.

A TINCTURE OF THE FRESH ROOT OF TRIOSTEUM PERFOLIATUM, LINN.

Description.—This coarse, leafy, perennial herb, grows to a height of from 1 to 4 feet. *Root* thick and sarcous, sub-divided into several horizontal sections; *stem* simple, hollow, glandularly pubescent; *leaves* opposite, ample, ovate-spatulate, sinuate, acuminate, abruptly narrowed and connate or almost perfoliate at the base, prominently reticulate veined and downy pubescent upon the under surface, and hairy above. *Inflorescence*, axillary whorls at the middle of the stem; *flowers* 1 to 6, dull or reddish purple, sessile. *Bracts* linear; *calyx* persistent; *lobes* linear-lanceolate, foliaceous. *Corolla* elongated cylindro-tubular, curved, gibbous at the base, scarcely longer than the calyx lobes, viscidly pubescent; *limb* more or less equally 5-lobed. *Stamens* 5, inserted upon the tube of the corolla; *filaments* hairy; *anthers* sagittate. *Ovary* generally 5-celled, each cell 1-ovuled; *ovules* suspended; *style* filiform, hairy; *stigma* 3 to 5-lobed. *Fruit* drupaceous, dry, orange-colored; *nutlets* 3-angled and 3-ribbed, 1-seeded; *endocarp* osseous, *testa* membranaceous.

Caprifoliaceæ.—A large family of shrubs and a few perennial herbs. *Leaves* opposite and destitute of stipules when normal. *Flowers* generally 5-merous, regular, or sometimes in the corolla irregular, hermaphrodite; *calyx* adnate to the ovary; *corolla* with its lobes imbricate in aestivation. *Stamens* as many as the lobes of the corolla, alternate with them, and inserted upon its tube. (Exc. *Adoxa* and *Linnaea.*) *Ovary* 2 to 5- or, by abortion, 1-celled; *ovules* anatropous, when only one then suspended and inverted; *raphe* dorsal. *Embryo* small in the axis of the fleshy albumen.

The following remedies belonging to this family are of special interest to us

---

* Τρεῖς, *treis*, three; ὀστέον, *osteon*, a bone; the fruit having three nutlets, shortened from *Triosteospermum*, Dill.

† Applied also to many species of Euphorbia, and to *Gillennia trifoliata*, Moench. (Rosaceæ.)

beside the two under consideration: the European Moschatel (*Adoxa Moschatellina*, Linn.), also found in Arctic America and sparsely in the Rocky Mountains; the European Elder (*Sambucus nigra*, Linn.), a native also of Asia and Northern Africa; and the European Fly Woodbine (*Lonicera Xylosteum*, Linn.). Two American species were proven too late for representation in this work, they are the Snowberry (*Symphoricarpus racemosus*, Michx.), a valuable remedy in vomiting pregnancy, as many suffering ladies have testified in my practice; and the High Cranberry (*Viburnum opulus*, Linn.), now proving valuable in many forms of uterine affections and puerperal diseases.

Outside of our Materia Medica the order contains: The Dwarf Elder (*Sambucus ebulus*, Linn.), probably the most active of that genus; and the Bush Honeysuckle (*Diervilla trifida*, Mœnch.).

History and Habitat.—The feverwort is indigenous to North America from Canada southward and westward to Alabama, growing on open woodlands in limestone soils; not really plentiful in any locality. It blossoms in June, and ripens its characteristically arranged fruit in September.

It was in all probability the Southern species *T. augustifolium*, Linn., that was principally used as an emetic in earlier days, and this is doubtless the plant sent to Pluckenet as *Dr. Tinker's Weed*, and gravely commented on by Poiret as follows:* "Ses racines et celles de l'especе précédente passent pour émétiques; le docteur Tinker est le premier qui les a mises en usage, et qui a fait donner à cette plante par plusieurs habitans de l'Amerique septentrional le d' *herbe sauvage du docteur Tinker.*" Triosteum is stated by Rafinesque to have been one of the aboriginal medicamentæ, called *Sincky*. A decoction is said to have been used by the Cherokee Indians in the cure of fevers (Porcher). The bark of the root has long been esteemed as an emetic and smoothly-acting cathartic, the former in doses of from 40 to 60 grains, the latter in half that amount; its cathartic action was claimed to be fully as sure as jalap. Dr. J. Kneeland calls attention to this plant as an application to painful swellings, regarding which he says:† "My attention was first called to it by a gentleman of observation and intelligence, who derived his knowledge of its value indirectly from the Onondaga Indians. So strongly did he back his claims with facts on cases of whitlow or felon, successfully treated, that I applied the bruised root, moistened, to the first well-marked case of onychia or felon which came to me for treatment. The young man upon whose hand it was, had not slept much for two nights. The whole hand was much swollen; the middle finger, tense and throbbing, was the centre from which the pain and swelling extended. It had been poulticed and thoroughly soaked in weak lye for three days, and still grew worse. We applied the *Triosteum, and nothing else.* After six hours' application he slept; the throbbing and tensive pain gradually diminished after the first application; in two days' time the swelling disappeared from the forearm and hand; in four days the finger affected, the whole palm, and the centre of the dorsum of the hand peeled, and complete resolution took place, no

* Bigelow, *Am. Med. Bot.*, 1, p. 90.

† *Loc. cit.*, *The Jour. of Mat. Med.*, Vol. I., N. S., 1859, 240.

pus having formed. In another case, wherein it was tried, only two applications were required to relieve the pain and throbbing, and complete resolution followed." Dr. Mulenberg says* that the dried and toasted berries of this plant were considered by some of the Germans of Lancaster County, Pa., an excellent substitute for coffee when prepared in the same way; having great respect for German taste I tried an infusion, but came to the conclusion that it was not the Lancaster County Germans' taste that I held in regard.

Triosteum is one of the drugs dismissed from the U. S. Ph., at the last revision.

PART USED AND PREPARATION.—The fresh root, gathered in Autumn, is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed well with one-sixth part of it, and the rest of the alcohol added. After first stirring, the whole is poured into a well-stoppered bottle, and allowed to stand eight days in a dark, cool place.

The tincture thus formed after filtration has a beautiful, clear, reddish-orange color by transmitted light, a bitterish odor and taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—The only analysis thus far made of the root is that by Dr. John Randall, communicated to the Linnæan Society of New England. His conclusions were that no pure resin exists in the plant, nor did he determine a volatile oil or free acid. The leaves under his manipulation yielded the most extract, and the root more than the stems. The sensible qualities of the root, however, he found to be essentially different from those of the herb. Water yields a greater quantity of extract than alcohol.

PHYSIOLOGICAL ACTION.—In Dr. Williamson's proving of the drug the prominent effects were: Nausea; vomiting; copious watery stools apparently proceeding from the small intestines, accompanied by stiffness of the lower extremities and cramps in the calves; aching in the bones; coldness and stiffness of the feet, and general perspiration.†

DESCRIPTION OF PLATE 74.

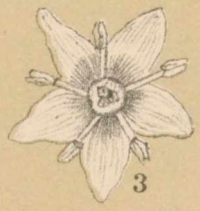
1. Top of plant, Binghamton, N. Y., June 15th, 1884.
2. A portion of the middle of the flowering plant.
3. A flower.
4. Opened corolla.
5. Pistil.
6. Stamen.
7. Pollen, x 200.
8. Fruit.
9. Seeds.

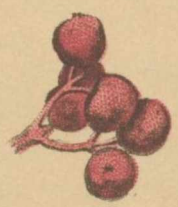
(3–6, 8 and 9, enlarged.)

---

* Barton, *Med. Bot.*, 1, p. 63.

† Allen, *Ency. Pure Mat. Med.*, 10, p. 25.





Fm. ad nat. del. et pinxt.

SAMBÙCUS CANADÉNSIS, Linn.

Tribe.—SAMBUCEÆ.

GENUS.—**SAMBUCUS,*** TOURN.

SEX. SYST.—PENTANDRIA TRIGYNIA.

SAMBUCUS CANADENSIS.

ELDER.

SYN.—SAMBUCUS CANADENSIS, LINN.; S. NIGRA, MARSH (NOT LINN.); S. HUMILIS, RAF.; S. GLAUCA, GRAY (NOT NUTT.).

COM. NAMES.—ELDER BUSH, ELDER BERRY; (FR.) SUREAU DU CANADA; (GR.) CANADISCHE HOLLUNDER.

A TINCTURE OF THE BUDS, FLOWERS, SHOOTS, AND LEAVES OF SAMBUCUS CANADENSIS, LINN.

Description.—This common, glabrous, suffrutescent perennial, usually attains a growth of from 6 to 10 feet. *Stems* somewhat ligneous, hollow, pithy, generally dying down to the ground, or persistent for a few years; *bark* verrucose; *pith* dense and bright white after the first year. *Leaves* compound, imparipinnate; *stipules* rare; *leaflets* 5 to 11, mostly 7, petiolulate, from ovate-oval to oblong-lanceolate, serrate, acuminate, the lower sometimes with a lateral lobe; *stipels* not uncommonly present, narrowly linear, and tipped with a callous gland. *Inflorescence* terminal, broad, flat, or depressed, 5-rayed, compound cymes; *flowers* small, creamy-white, and sickishly odorous. *Calyx* minute, 5-lobed; *lobes* somewhat deltoid, acute. *Corolla* rotate, or somewhat urceolate; *limb* broadly spreading; *lobes* 5, obtuse. *Stamens* 5, alternate with the lobes of the corolla, and attached to the base of its tube. *Stigmas* 3; *styles* capitate. *Fruit* a baccate, sweet and juicy, dark-purple drupe, never red, but later becoming black; *bloom* slight. *Nutlets* 3, small, 1-seeded, punctate-rugulose; *seed* suspended; *testa* membranaceous.

History and Habitat.—This species is indigenous to North America, where it extends from New Brunswick westward to Saskatchewan, southward to Florida and Texas, and to the mountains of Colorado, Utah, and Arizona. It grows in rich alluvial soils, blossoming in July and fruiting in September.

Our species is not sufficiently distinct from the European *S. nigra*, Linn., from which it differs only in being less woody, and having more loose cymes, larger flowers and more compound leaves. The bracteate inflorescence, considered specific, does not seem to be a constant feature. The American species was introduced into England in 1761.

---

* Σαμβύκη, *sambuke*, an ancient musical instrument, said to have been made of the wood.

The pith of the Elder has many offices to fill in the arts and manufactures; the berries make a really pleasant wine; and, among the poorer class of people (it must be more from necessity than choice), they are made into pies, like the huckleberry.

In domestic medicine this plant forms almost a pharmacy in itself, and has been used substantially as follows: A decoction of the flowers and leaves, or an ointment containing them, was used as an application to large wounds to prevent deleterious consequences from flies; the leaf-buds proved themselves a violent and unsafe cathartic; the flowers, in a warm infusion are stimulant, excitant, and sudorific; in cold, diuretic, alterative, and laxative (Elderblow Tea); they were also employed, in ointment, as a discutient; the inner bark is a severe hydrogogue cathartic, emetic, deobstruent, and alterative, valuable in intestinal obstruction and anasarca; the berries proved aperient, diuretic, diaphoretic, and cathartic, valuable in rheumatic gout, scrofula, and syphilis—the juice making a cooling, laxative drink.

In pharmacy the leaves have been used to impart a clear green tint to oils, etc. (*Oleum Viride*, *Unguentum Sambuci foliorum*), and the flowers for perfumes.

Sambucus Canadensis (*flores*) are officinal in the U. S. Ph.; in the Eclectic Materia Medica the preparations are: *Aqua Sambuci*, *Syrupus Sarsaparillæ Compositus*,* *Unguentum Sambuci*, and *Vinum Sambuci*.†

PART USED AND PREPARATION.—Equal parts of the fresh flower-buds, flowers, young twigs, and leaves are taken, and treated as in the preceding drug (p. 74–3). The resulting tincture has a clear orange-brown color by transmitted light; it retains the sweetish odor and taste of the flowers; and has an acid reaction.

CHEMICAL CONSTITUENTS.—*Viburnic Acid.* This body, identical with valerianic acid,‡ was proven to exist in the bark of this species by C. G. Traub,§ who succeeded in obtaining its characteristic odor, and valerianate of zinc after the addition of the sulphate of that metal.

Oil of Sambucus.—This volatile body, found in the flowers of *S. nigra*, was proven by Traub to also exist in the bark of this species. It is described as a thin, light-yellow body, having the odor of the flowers, a bitter, burning, afterward cooling taste; becoming of a butter-like consistence, and solidifying at 0° (32° F.) to a crystalline mass.

Tannin, sugar, fat, resin, and a coloring-matter were also determined.

PHYSIOLOGICAL ACTION.—Dr. Ubelacker's experiments with from 20 to 50 drops of the tincture gave the following symptoms of physical disturbance: Drawing in the head, with anxious dread; flushed and blotched face; dryness

---

* See p. 92–2, foot-note to *Syrupus Araliæ Compositus*, as the syrup is now called.

† This so-called *Hydragogue Tincture* contains Elder-bark, Parsley-root, and Sherry.

‡ See p. 155–3.

§ *Am. Jour. Phar.*, 1881, 392.

and sensation of swelling of the mucous membranes of the mouth, pharynx, larynx, and trachea; frequent and profuse flow of clear urine; heaviness and constriction of the chest; palpitation of the heart; pulse rose to 100, and remained until perspiration ensued; sharp, darting rheumatic pains in the hands and feet; exhaustion and profuse perspiration, which relieved all the symptoms.

DESCRIPTION OF PLATE 75.

1. End of flowering branch, Binghamton, N. Y., July 20th, 1885.
2. Flower, showing calyx.
3. Face of flower.
4. Stamen.
5. Pistil.
6. A portion of fruiting cyme.
7. Seed.

(2–5 and 7 enlarged.)

F m .ad nat.del.et pinxt. GEPHALÁNTHUS OCCIDENTÀLIS, Linn.

GENUS.—**CEPHALANTHUS,*** LINN.

SEX. SYST.—TETRANDRIA MONOGYNIA.

CEPHALANTHUS.

BUTTON BUSH.

SYN.—CEPHALANTHUS OCCIDENTALIS, LINN.

COM. NAMES.—BUTTON BUSH, BUTTON-WOOD,† CRANE WILLOW, POND-DOGWOOD, SNOWBALL,‡ GLOBE FLOWER;§ (FR.) BOIS DE PLOMB, CEPHALANTHE D'AMERIQUE; (GER.) KNOPFBUSCH, AMERIKANISCHE WEISSBALL.

A TINCTURE OF THE FRESH BARK OF CEPHALANTHUS OCCIDENTALIS, LINN.

Description.—This smooth or pubescent‖ shrub attains a growth of from 5 to 15 feet. *Stem* diffusely branching; *bark* smooth and reddish on the branchlets, rough and yellowish on the stems; *branches* opposite. *Leaves* large, opposite, and ternate, both arrangements often appearing upon the same branch, petiolate, ovate, or ovate-lanceolate, pointed, dark-green, and smooth; *stipules* intermediate, ovate, sometimes toothed. *Inflorescence* dense, axillary and terminal, globular heads; *peduncles* longer than the diameter of the heads; *flowers* creamy-white, sessile upon a globose, hirsute receptacle. *Calyx* tube inversely pyramidal; *limb* 4-toothed. *Corolla* slender, tubular, or funnel-form; *margin* 4-toothed; *teeth* erect, imbricate in æstivation. *Stamens* 4, hardly exserted. *Style* filiform, greatly exserted; *stigma* capitate, globose. *Fruit* small, dry, pyriform, 2 to 4 celled, cleaving from the base to form 2 to 4 1-seeded divisions; *seeds* pendulous, crowned with acork-like arillus; *embryo* straight in the axis; *albumen* somewhat cartilaginous; *cotyledons* leaf-like.

Rubiaceæ.—This large and important order has but few representatives in North America, but yields many valuable drugs in the hotter climates. It is characterized as follows: Herbs or shrubs. *Leaves* opposite, entire, or sometimes whorled and astipulate; *stipules* intermediate and connective. *Calyx* coherent with the ovary. *Corolla* regular, tubular. *Stamens* as many as the lobes of the corolla, and inserted upon its tube. *Ovary* 2 to 4 celled. *Seeds* anatropous or amphitropous.

The important medicinal plants of this family are: The cinchonas or Peruvian barks, *i.e.*, pale bark (*Cinchona officinalis, Linn.*), Calisaya bark (*Cinchona Calisaya, Wedd.*), red bark (*Cinchona succiruba, Pav.*), Columbian bark (*Cinchona*

---

* Κεφαλή, *kephale*, a head; ἄνθος, *anthos*, a flower.

† The true button-wood is the sycamore, a large tree growing along rivers (*Platanus occidentalis, Linn.*).

‡ The true snowball is *Symphoricarpus racemosus, Mich.* (Caprifoliaceæ).

§ The true globe flower is *Trollius laxus, Salisb.* (Ranunculaceæ).

‖ *Var. pubescens, Raf.*

cordifolia, Mut.), lancifolia bark (*Cinchona lancifolia, Mut.*), crown bark (*Cinchona condaminea, D. C. var. crispa* and *var. Chahuarguera*), gray bark (*Cinchona micrantha, Ru. et Pav.*), and many minor species; Gambier, or pallid catechu (*Uncaria Gambier, Rox.*), coffee (*Coffea Arabica, Linn.*), ipecacuanha (*Cephælis Ipecacuanha, A. Rich.*), Cainca (*Chiococca racemosa, Linn.*), madder (*Rubia tinctoria, Linn.*), bitter bark (*Pinckneya pubens, Mich.*), cleavers (*Gallium aparine, Linn.*) and others of minor import.

History and Habitat.—The button bush is indigenous to the United States and Canadas, growing as far south as Florida and Louisiana, and west to Missouri. It habits the borders of wet places, and flowers from July to August. The flowers of cephalanthus, especially those of the more southern individuals, are pleasantly odorous, the perfume being likened to that of jessamine. Rafinesque mentions several varieties of this species, the only one apparently deserving special designation being *var. macrophylla, Raf.*, distinguishable by having larger leaves, and an hirsute corolla; he stations this plant in Louisiana.

The medical history of Cephalanthus is not important; it has been used with accredited success in intermittent and remittent fevers, obstinate coughs (Elliott), palsy, various venereal disorders (Merat), and in general as a tonic, laxative, and diuretic.

PART USED AND PREPARATION.—The fresh bark of the stem, branches, and root* is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. After having stirred the whole well, pour it into a well-stoppered bottle, and let it stand eight days in a dark, cool place.

The tincture, separated from the above mass by filtration, has a light, clear, orange-brown color, by transmitted light, a bitter, astringent taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—An analysis of the bark by E. M. Hattan† yielded:

An uncrystallizable bitter principle, soluble in both water and alcohol.
A fluorescent body, forming apicular crystals, soluble in water and alcohol.
Two resins (uninvestigated), and tannin.

PHYSIOLOGICAL ACTION.—We have a proving of this drug by Dr. E. D. Wright,‡ but it is not complete enough to give us an idea of the action. It would seem, from the close resemblance and botanical relation of this plant to the cinchonas, that a more thorough proving might develop in it a very useful addition to our remedies.

DESCRIPTION OF PLATE 76.

1. End of flowering branch, Binghamton, N. Y., June 18th, 1883.
2. Flower (enlarged).

---

* The bark of the root apparently contains the greatest proportion of the bitter principle of the plant.

† *Am. Jour. Phar.*, 1874, p. 357.

‡ *Am. Hom. Obs.*, 1875, p. 177.

3

1

2

Fm ad nat.del.et pinxt.

MITCHÉLLA RÈPENS, Linn.

GENUS.—**MITCHELLA,*** LINN.

SEX. SYST.—TETRANDRIA MONOGYNIA.

MITCHELLA.

PARTRIDGE-BERRY.

SYN.—MITCHELLA REPENS, LINN.; MITCHELLA UNDULATA, S. & Z.; SYRINGA BACCIFERA, ETC., PLUK.

COM. NAMES.—PARTRIDGE-BERRY, SQUAW-BERRY, SQUAW-VINE, TWO-EYED CHEQUER-BERRY, REEPING CHECKER-BERRY, WINTER-CLOVER, DEER-BERRY.

A TINCTURE OF THE WHOLE FRESH PLANT, MITCHELLA REPENS, LINN.

Description.—This pretty little plant, creeping about in the moss at the foot of our forest trees and decayed stumps, attains a growth of from 6 to 14 inches. *Root* cylindrical, branched, horizontal, and noduled at the insertion of the tufted, opposite rootlets. *Stem* glabrous, branching widely, and rooting at each axilla. *Leaves* orbicular-cordate or oval and subcordate, sometimes having a whitish line over the midrib; dark, evergreen, slender, petioled; *stipules* minute, somewhat triangular awl-shaped. *Inflorescence* terminal; *flowers* in pairs with united ovaries, sometimes solitary and double (fig. 3); the flowers on one plant may have included stamens and an exserted style, while another show an included style and exserted stamens. This fact has led Mr. Thos. Meehan† to consider the species dicœcious. The first form, he alleges, to be that of the female; the last, the male plant. As far as my observation extends, I have as yet been unable to discover a plant that bore no fruit, and all parts examined appear to be fully developed internally as well as externally. *Peduncle* short, or, in the double form, almost wanting. *Calyx* 4-toothed. *Corolla* slender, funnel-form; *limb* 4-lobed; *lobes* spreading or reflexed, densely clothed with white hairs upon the upper face and in the throat and tube of the corolla. *Stamens* 4; *filaments* inserted upon the corolla; *anthers* oblong. *Style* single filiform; *stigmas* 4, linear. *Fruit* a fleshy, edible, globose, baccate, double drupe, retaining the persistent teeth of both calices, and remaining fresh on the plant all winter; *nutlets* 8 (4 to each ovary), small, seedlike, and bony. Read description of the order, under Cephalanthus, 76.

History and Habitat.—The Partridge-berry is indigenous to North America, from the Canadas to the extreme southern limits of the United States, and has been found in Mexico and Japan. It grows in moist woods, especially those abounding in evergreens. It flowers in July.

---

* In commemoration of Dr. John Mitchell, an early and excellent American botanist.

† *Am. Jour. Phar.*, 1868, p. 554.

Mitchella is one of the many plants used by the American Aborigines as a parturient, frequent doses of a decoction being taken during the few weeks just preceding confinement. It has also been found to be a valuable diuretic and astringent, and to have an especial affinity to various forms of uterine difficulties.

The plant is not mentioned in the U. S. Ph. In the Eclectic Materia Medica its preparations are: *Extractum Mitchellæ* and *Syrupus Mitchellæ Compositus.**

PART USED AND PREPARATION.—The whole fresh plant is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp well mixed with one-sixth part of it, and the rest of the alcohol added. After a thorough mixture, the whole is poured into a well-stoppered bottle, and allowed to stand eight days in a dark, cool place.

The tincture, separated by filtering the mass, should have a deep orange-red color by transmitted light, an odor between that of Scotch snuff and oil of wintergreen, an astringent taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—No analysis has been made, as far as I can determine, of this plant. The tincture, made as above, contains a large percentage of tannin, and a resin precipitable by water.

PHYSIOLOGICAL ACTION.—The symptoms, as recorded by Drs. F. C. Duncan and P. H. Hale,† show that Mitchella causes a general congestion, with dryness and burning of the mucous membranes of the alimentary tract. The clinical results would seem to show a tonic action upon involuntary muscular fibres. The drug merits more extended proving.

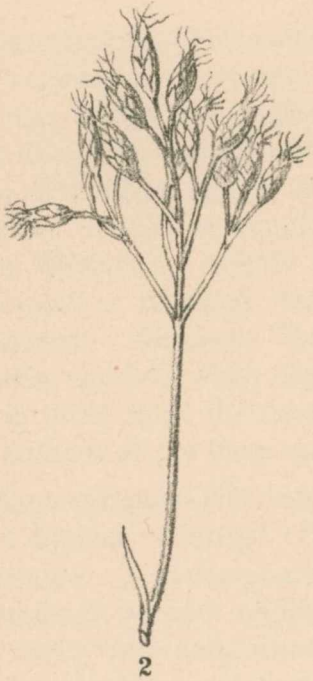
DESCRIPTION OF PLATE 77.

1. Whole plant (somewhat reduced); Pamrapo, N. J., June 8th, 1879.
2. A pair of flowers (somewhat enlarged).
3. A double flower (somewhat enlarged).

---

* Mitchella, Helonias, Viburnum op., and Caulophyllum.

† Allen, *Ency. Pure Mat. Med.*, vol. vi, p. 373.



2

1

Fm. ad nat. del. et pinxt.

EUPATÒRIUM PURPÙREUM, Linn.

Tribe.—EUPATORIACEÆ.

GENUS.—**EUPATORIUM,*** TOURN.

SEX. SYST.—SYNGENESIA ÆQUALIS.

EUPATORIUM PURPUREUM.

PURPLE BONESET.

SYN.—EUPATORIUM PURPUREUM, TRIFOLIATUM, AND MACULATUM, LINN.; E. VERTICILLATUM, MUHL.; E. TERNIFOLIUM, ELL.

COM. NAMES.—PURPLE BONESET, THOROUGH-WORT, OR HEMP-WEED; JOE-PYE,† OR JOPI-WEED; TRUMPET-WEED; QUEEN OF THE MEADOW;‡ GRAVEL-ROOT; (GER.) PURPURFARBENER WASSER-HANF.

A TINCTURE OF THE FRESH ROOT OF EUPATORIUM PURPUREUM, L.

Description.—This common herb varies greatly in form and foliage, the type being very tall and graceful. *Stem* rigidly erect, 6 to 12 feet high,§ stout, simple, and either hollow or furnished with an incomplete pith; it is punctate in lines and purple above the nodes, or often covered with elongated spots (*E. maculata*, Linn.). *Leaves* verticillate, mostly in fives, nearly destitute of resinous punctæ, oblong-lanceolate, acutish or acuminate, coarsely serrate, roughish and reticulate-veiny; *petioles* distinct or merely represented by the contracted bases of the leaves. *Inflorescence* a terminal, dense, compound corymb; *heads* very numerous, 5 to 10-flowered. *Involucre* flesh-colored, cylindrical; *bracts* thin, membranaceous, somewhat scarious when dry, and faintly 3-striate, obtuse; they are closely imbricated in three rows, the exterior successively shorter. *Receptacle* flat, not hirsute. *Style* bulbous at the base, much exserted. *Achenia* smooth, glandular.

Eupatorium.—This vast genus contains in North America alone 39 species and 16 distinct varieties; other species are found in South America, Asia, Africa, and Europe. It is composed mostly of perennial herbs, but contains a few annuals, and shrubs in warmer regions. *Leaves* mostly opposite and simple, resinous and bitter, rarely alternate, whorled, or divided. *Heads* small, homogamous, discoid, and corymbosely-cymose or paniculate, rarely solitary; *involucre* cylindrical or somewhat campanulate; *scales* numerous, purple, blue, or white, never really yellow, though sometimes ochroleucous. *Flowers* hermaphrodite and homochromous; *corolla* tubular and regular, 5-toothed; *anthers* included, not caudate; *receptacle* naked and flat. *Style* cylindraceous, branched, the branches exserted, more or less thickened upward and very minutely pubescent. *Pappus* a single

---

* Mithridates Eupator, king of Pontus, who was first to use the plant as a remedy.

† An Indian by this name cured typhus in New England, with this plant, by powerful sweating.

‡ The Queen of the Meadow is more properly *Spiræa salicifolia*, Linn. (Rosaceæ).

§ The individual represented in the plate was nearly 10 feet high, growing in an open, rich field.

series of slender but somewhat stiff and rough capillary bristles. *Achenia* 5-angled, not striate.

The species of this genus used in medicine are, beside the two under consideration, the American *E. aromaticum*, Linn., *sessilifolium*, Linn., *tencrifolium*, Willd., and *ageratoides*, Linn., all considered tonic, diaphoretic, and antiperiodic, the latter being the supposed cause of the "trembles" in cattle; *E. rotundifolium*, Linn., a palliative in consumption; the Texan *mata* (*E. incarnatum*, Walt.) is said to be diuretic, and is used for flavoring tobacco; while *E. fœniculceum*, Willd., *leucolepsis*, T. & G., and *hyssopifolium*, Linn., are considered to be antidotes to the poisonous bites of reptiles and stings of insects. The European *E. cannabinum*, Linn., is diuretic, emetic, and purgative; the South American *E. glutinosum* is one of the sources of the substance known as *Matico*;* the Jamaican *E. nervosum* is regarded as an almost certain cure for cholera, typhus, typhoid, and small-pox; while the Brazilian *aya-pana* (*E. ayapana*, Vent.) is an aromatic tonic and febrifuge, and is considered a sure remedy—if timely used—for antidoting the effects of the bites of poisonous reptiles and insects; this last is said to be the most powerful species of the genus, and as such, it should be carefully proven.

Compositæ.—This immense and purely natural order, consists of herbs, and rarely shrubs and trees; it comprises one-tenth of all known phænogamous plants, and one-eighth of those of North America, where it has 237 genera and 1610 species, of which 1551 are indigenous. Its members are easily distinguished as such, even by general observation; but many of the genera and species require close and careful study for their identification.

Since this work was begun, and too late for revision, Prof. Asa Gray's almost phenomenal volume,† including this order, appeared. In his careful and laborious revision of the order many changes were instituted in the arrangement and names of the tribes and genera, making the following table necessary to an understanding of the order as it stands at present:

New Arrangement.	This Work.	Old Arrangement.	New Arrangement.	This Work.	Old Arrangement.
Tribe.	Genus.	Tribe.	Tribe.	Genus.	Tribe.
Eupatoriaceæ.	78, 79. Eupatorium.	(Same.)	Anthemideæ.	87, 88. Artemisia.	Senecionideæ.
Asteroideæ.	80. Erigeron.	"	Senecionideæ.	90. Erechthites.	(Same.)
Inuloideæ.	89. Gnaphalium.	Senecionideæ.	"	91. Senecio.	"
"	81. Inula.	Asteroideæ.	Cynaroideæ.	92. Arctium.	Cynareæ (Lappa).
Helianthoideæ.	82. Ambrosia.	Senecionideæ.	Cichoriacæ.	93. Cichorium.	(Same.)
"	83. Helianthus.	"	"	94. Prenanthes.	" (Nabalus).
Anthemideæ.	84. Anthemis.	"	"	95. Taraxacum.	"
"	85. Achillea.	"	"	96. Lactucca.	"
"	86. Tancetum.	"			

* The officinal matico, however, is derived from *Piper angustifolium*, R. & P. (Piperaceæ).

† *Synop. Flora of N. A.*

Description.*—"*Flowers* in an involucrate head on a simple receptacle, 5-merous, or sometimes 4-merous; with *lobes* of the epigynous *corolla* valvate in the bud; *stamens* as many as corolla lobes and alternate with them, inserted on the tube; *anthers* connate into a tube (syngenesious); *style* in all fertile flowers 2-cleft or lobed at the summit and bearing introrse-marginal *stigmas; ovary* 1-celled, a single anatropous *ovule* erect from the base, becoming an exalbuminous *seed* with a straight *embryo*, the inferior *radicle* shorter and narrower than the *cotyledons;* the *fruit* an akene. Tube of the *calyx* wholly adnate to the ovary; its *limb* none, or absolute, or developed into a cup or teeth, scales, awns, or capillary bristles. *Corolla* with nerves running to the sinuses, then forking and bordering the lobes, rarely as many intermediate nerves. *Anthers* commonly with sterile tip or appendage; the cells introrse, discharging the pollen within the tube; this forced out by the lengthening of the *style*, which in hermaphrodite and male flowers is commonly hairy-tipped or appendaged. *Pollen-grains* globose, echinulate, sometimes smooth, in CICHORIACEÆ 12-sided. *Leaves* various; no true stipules. *Development* of the flowers in the head centripetal; of the heads when clustered or associated, more or less centrifugal, *i. e.*, heads disposed to be cymose. *Juice* watery, in some resinous, in the last tribe milky.

"Heads *homogamous* when all its flowers are alike in sex; *heterogamous* when unlike (generally marginal flowers female or neutral, and central hermaphrodite or by abortion male); *androgynous* when of male and female flowers; *monœcious* or *diœcious* when the flowers of separate sexes are in different heads, either on same or different plants; *radiate* when there are enlarged ligulate flowers in the margin; wholly *ligulate* when all the flowers have ligulate corollas, *discoid* when there are no enlarged marginal corollas. When these exist they are sometimes called the *ray;* the other flowers collectively occupy the *disk*. The head (compound flower of early botanists), in Latin *capitulum*, is also named *anthodium*. Its involucre (periclinium of authors) is formed of separate or sometimes connate reduced leaves, *i. e., bracts* (*squamæ* or scales); the innermost of these bracts subtend the outermost or lowest flowers. The axis within or above these is the *receptacle* (*clinanthium*), which varies from plane to conical or oblong, or even cylindrical or subulate. When the receptacle bears flowers only it is naked, although the surface may be *alveolate, foveolate* or merely *areolate*, according as the insertion of the ovaries or akenes is surrounded or circumscribed by honeycomb-like or lesser elevations, or, when these project into bristles, slender teeth or shreds, it is *fimbrillate;* it is *paleaceous* when the disk flowers are subtended by bracts; these usually chaff-like, therefore called *paleæ, chaff*, or simply bracts of the receptacle. In place of calyx-limb there is more commonly a circle of epigynous bristles, hairs or awns; the *pappus*, a name extended to the calyx-limb of whatever form or texture; its parts are bristles, awns, palae, teeth, etc., according to shape and texture. Corollas either all *tubular* (usually enlarging above the insertion of the stamens into the *throat*, and 4 to 5-lobed at summit, mostly regular), or the marginal ones strap-shaped, *i. e., ligulate*, the elongated limb (*ligule*) being explanate, and 3 to 5-toothed

* I use Prof. Gray's full description of the order from the volume above referred to, Vol. I., pt. 2, 48.

at the apex. Such are always female or neutral, or, when all the flowers of the head have ligulate corollas, then hermaphrodite. Anthers with basal auricles either rounded or acute, or sometimes produced into tails (*caudate*). Branches of the style in female flowers and in some hermaphrodite ones margined with stigma, *i. e.*, stigmatic lines, quite to the tip; in most hermaphrodite flowers these lines shorter, occupying the lower portion, or ending at the appendage or hairy tip." The largest subdivision or series of this order is the TUBULIFLORÆ, wherein the hermaphrodite flowers have tubular and regular flowers. The LABIATIFLORÆ have corollas of all, or only of the hermaphrodite flowers, bilabiate. The LIGULIFLORÆ have all flowers hermaphrodite and all corollas ligulate.

Beside the 19 medicinal species treated of in this work, and those spoken of under the description of the genus Eupatorium, we have provings of the following: Wyethia (*Wyethia, Helenoides*, Nutt.); the New Zeyland *Puka-puka* (*Brachyglottis repens*, Forsk.); the Arctic American Grindelia (*Grindelia squarrosa*, Dunal.); the European Mountain Arnica (*Arnica montana*, Linn.); the Spanish Pellitory (*Pyrethrum Parthenium*, Linn.); the European Coltsfoot (*Tussilago Farfara*, Linn.); and the Italian Sweet-scented Coltsfoot (*T. fragrans*, Linn.); the European Daisy (*Bellis perennis*, Linn.); the South European Marigold (*Calendula officinalis*, Linn.); the Blessed Thistle (*Carduus Benedictus*, Linn.; *Centaurea Tagana*, Willd.); Chamomilla, the German Chamomile (*Matricaria Chamomilla*, Linn.); and Cina, the European Wormseed (*Artemisia Cina*, Berg.; *A. santonica*, Linn., Artemisia Contra.).*

Outside of our materia medica many valuable, and secondary, drugs are used; prominent among them we find: the American Daisy-fleabane (*Erigeron heterophyllum*, Muhl.), a reputed remedy for gravel, hydrothorax, and gout; and *E. Philadelphicum*, Linn., a powerful emmenagogue. The German Pellitory (*Anacyclus officinarum*, H.D.B.), a powerful irritant, sialagogue and stimulant. The East Indian *Veronia anthelmintica*, Willd., is considered a most powerful vermifuge; the Indian *Elephantopus scaber*, Linn., is used on the coast of Malabar in dysuria; the Mexican *Xoxonitztal* or *Yoloxiltic* (*Piqueria trinervia*, Cav.) is said to be a valuable antiperiodic. Many species of *Liatris* are considered powerful diuretics, especially *L. squarrosa*, Willd., and *L. odoratissima*, Willd. The Brazilian *Coracoa de Jesu* (*Mikania officinalis*, Mart.) is claimed to be an excellent stomachic-tonic; and the South American *M. Guaco*, H. & B., and the Brazilian *Erva da Cobra* (*M. opifera*, Mart.), are considered efficacious antidotes to the bites of the cobra de capello, and those of malignant insects. The common European Fleabane (*Pulicaria dysenterica*, Gærtn.) is said to have once cured the Russian army of dysentery. Two species of *Bidens*, viz.: the European *B. tripartita*, Linn., and the Carolinian *B. Chrytsanthemoides*, Michx., together with the South American *Spilanthes oleracea*, Jacq. (*Bidens fervida*, Lam.), produce acrid and copious salivation. The May-weed, *Maruta cotula*, D.C.), so common almost generally throughout the North Temperate Zone, is fetid and blistering, and causes copious vomiting and

* Bentley and Trimen, in their work on "Medicinal Plants," consider that the true source of *Santonine* is from the Russian and Asiatic *Artemisia pauciflora*, Weber (*A. Cina*, Willk., not Berg.).

diaphoresis; it should be proven. The Egyptian and Palestine *Babouny* or *Zeysoum* (*Santolina fragrantissima*, Forsk.) is substituted in Cairo for chamomile, and used in eye affections. The Chinese and Japanese *Artemisia Indica*, Willd., is said to be a powerful deobstruent and antispasmodic. The East Indian *Emila sonchifera*, D.C., is used in India as a febrifuge. Thus throughout the order almost every genus has its useful species, especially in their native localities.

Among the edible vegetables afforded by the order, we find the Jerusalem Artichoke (*Helianthus tuberosum*, Linn.);* the European salsify (*Tragopogon porrifolius*, Linn.); Endive and Chiccory, mentioned under Cichorium Intybus, 93; and Lettuce (*Lactuca sativa*, Linn.).

History and Habitat.—Eupatorium purpureum is indigenous to North America. Its northern range extends from New Brunswick to Saskatchewan; thence it grows southward to Florida and westward to New Mexico, Utah, and British Columbia. It grows in rich, low grounds, where it blossoms throughout the summer months.

The previous use of the purple flowered boneset was very similar to that of its congener, E. perfoliatum. It, however, has proven especially valuable as a diuretic and stimulant, as well as an astringent tonic. It proves useful in dropsy, strangury, gravel, hematuria, gout and rheumatism; seeming to exert a special influence upon chronic renal and cystic trouble, especially when there is an excess of uric acid present (King).

The preparations of the Eclectic Materia Medica are: *Decoctum Eupatorii Purpurei; Infusum Eupatorii Purpurei*, and *Infusum Epigeæ Composita.*†

PART USED AND PREPARATION.—The fresh root should be chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. After having stirred the whole well, pour it into a well-stoppered bottle, and allow it to stand eight days in a dark, cool place.

The tincture separated from this mass by filtration has a clear, orange color by transmitted light. It is slightly bitter and astringent, has a somewhat terebinthic odor, and an acid reaction.

CHEMICAL CONSTITUENTS.—No specific analysis to determine a special principle has been made of this plant. The chemistry of E. perfoliatum is probably applicable more or less to this species.

Eupurpurin.—This so called oleoresin was precipitated from a tincture of the root by Merrell. The body is thrown down when the alcoholic tincture is poured into twice its volume of water and the alcohol is filtered off. It results as a thick,

---

* The true artichokes, however, are, the succulent receptacle of the South European *Cynaria Scolymus*, Linn., and *Cardoons, i. e.*, the leafstalks of *C. carunculus*.

† Epigæa, Eupatorium purpureum, Aralia hispida, and Althea officinalis.

dark greenish-brown mass, having a nauseous taste, and exhibiting, as far as known, the full action of the root. It contains all those principles of the root not soluble in water.

PHYSIOLOGICAL ACTION.—Eupatorium purpureum—in doses of from 10 to 60 drops of the tincture—causes increased secretion of the glands of the mouth; nausea; crampy pains in the stomach and bowels; aching or cutting pains in the bladder with a sensation of fullness and soreness, and a constant desire to void urine, with scanty discharge; increased heart's action; and a general feeling all through the system of languor, soreness, faintness, and weakness, with yawning and intense desire to sleep.*

DESCRIPTION OF PLATE 78.

1. Whole plant, 15 times reduced, Chemung, N. Y., September 10th, 1879.
2. One of the smaller branches of the corymb.

* Mrs. Dresser's experience with the drug. Hale, *New Rem.*, l. c.

Ĕ.m. ad nat del. et pinxt. EUPATÒRIUM PERFOLIÀTUM, Linn.

Tribe.—EUPATORIACEÆ.

GENUS.—**EUPATORIUM.***

SEX. SYST.—SYNGENESIA ÆQUALIS.

EUPATORIUM PERFOLIATUM.

BONESET.

SYN.—EUPATORIUM PERFOLIATUM, LINN.; E. CONNATUM, MICHX.; E. SALVIÆFOLIUM, SIMS; E. VIRGINIANUM, PLUK.

COM. NAMES.—BONESET, THOROUHWORT, AGUE-WEED, VEGETABLE ANTIMONY, INDIAN SAGE, FEVERWORT,* CROSSWORT, SWEATING WEED, THOROUGH-WAX;† (FR.) EUPATORIE PERFOLIÉE, HERBE PARFAITE, HERBE À FIÈVRE; (GER.) DURCHWACHSENER WASSERHANF.

A TINCTURE OF THE WHOLE FRESH PLANT, EUPATORIUM PERFOLIATUM, L.

Description.—This familiar plant grows to a height of from 2 to 4 feet. *Stem* stout, cylindrical, or somewhat terete, fastigiately branched above, and villous-pubescent throughout; *leaves* connate perfoliate, divaricate, narrowly lanceolate and acuminate; they are prominently one-ribbed, rugose, copiously studded with resinous dots, finely and closely crenulate-serrate, dark and shining green above and soft-pubescent or almost cottony beneath. *Inflorescence* a dense, somewhat convex, compound, capitate, corymbose cyme; *heads* small, very numerous; *bracts* narrowly-lanceolate, hairy, and furnished with slightly scarious, acutish tips; *flowers* mostly 10; *corolla* tubular-campanulate; *teeth* broadly triangular. *Akenes* small glandular, oblong-linear, smooth, and bluntly 5-angled; *pappus* shorter than the corolla. The description of *Eupatorium* as given under the preceding drug should be read in connection with this.

History and Habitat.—Boneset is a common plant, indigenous to North America, where it ranges from New Brunswick to Dakota in the North, to Florida and Louisiana in the South. It grows in marshy places on the borders of lakes, ponds, and streams, where it blossoms from July to September.

There is probably no plant in American domestic practice that has more extensive or frequent use than this. The attic, or woodshed, of almost every country farm-house, has its bunches of the dried herb hanging tops downward from the rafters during the whole year, ready for immediate use should some member

---

* The true Feverwort with us is *Triosteum perfoliatum* (Caprifoliaceæ).

† The true Thoroughwax is *Bupleurum rotundifolium*, Linn. (Umbelliferæ).

of the family, or that of a neighbor, be taken with a cold. How many children have winced when the maternal edict: "drink this boneset; it'll do you good," has been issued; and how many old men have craned their necks to allow the nauseous draught to the quicker pass the palate! The use of a hot infusion of the tops and leaves to produce diaphoresis, was handed down to the early settlers of this country by the Aborigines, who called it by a name that is equivalent to ague-weed. It was first introduced, as a plant, into England in 1699; but was not used in medical practice, even in this country, until about the year 1800, but it now has a place in every work on Medical Botany which treats of North American plants.

Eupatorium perfoliatum is diaphoretic only when given in generous doses of the hot infusion; a cold decoction is claimed to be tonic and stimulant in moderately small, laxative in medium, and emetic in large doses. It is also said to be anti-dyspeptic and anti-rheumatic. It is prominently adapted to cure a disease peculiar to the South, known as break-bone fever (Dengue), and it is without doubt from this property that the name boneset was derived. This herb has also been found to be curative in intermittent fever, bilious fever, bilious colic, typhus, and typhoid conditions, influenza, catarrhal fever, rheumatism, lake fever, yellow fever, and remittent types of fevers in general. Many of the earlier works allude to this species as being diuretic, and therefore of great use in dropsy; this is evidently an error of substitution, the previously described drug being the species used.

Dr. Barton, who had made this species one in general use in his practice, observes as follows: "The late Samuel C. Hopkins, M.D., who resided in the village of Woodbury, N. J., and had an extensive practice in a range of fifteen or twenty miles of a populous tract of country, in which, from the low and marshy nature of the soil—exposure of many of the inhabitants holding fisheries, to the water and other pernicious causes—intermittent and typhus fevers were very prevalent, and the latter particularly malignant. The Doctor was among those partial to the sweating plan of treating this fever, and his unusual success in a multitude of cases for five or six years in succession, is strongly in favor of that mode of practice. The boneset was the medicine used in producing this effect. He prescribed it freely in warm and cold decoction, but preferred the warm. He assured me that in many instances his sole reliance was upon this plant, which was occasionally so varied in its manner of exhibition as to produce emesis, and frequently was intentionally pushed to such extent as to excite free purging. Its diaphoretic effect, however, he deemed it indispensable to ensure, and therefore preferred in general giving it warm." *

My friend, Dr. Henry S. Sloan, of this city, relates his personal experience with this drug as follows: When a young man, living in the central part of this State, he was attacked with intermittent fever, which lasted off and on for three years. Being of a bilious temperament, he grew at length sallow, emaciated, and hardly able to get about. As he sat one day, resting by the side of the road, an old lady of his acquaintance told him to go home and have some thoroughwort

---

* Barton, *Med. Bot.*, ii, 136.

"fixed," and it would certainly cure him. (He had been given, during the years he suffered, quinine, cinchonine, bark and all its known derivatives, as well as cholagogues, and every other substance then known to the regular practitioner, without effect; the attacks coming on latterly twice a day.) On reaching home, with the aid of the fences and buildings along the way, he received a tablespoonful of a decoction of boneset evaporated until it was about the consistency of syrup, and immediately went to bed. He had hardly lain down when insensibility and stupor came on, passing into deep sleep. On awaking in the morning, he felt decidedly better, and from that moment improved rapidly without farther medication, gaining flesh and strength daily. No attack returned for twenty years, when a short one was brought on by lying down in a marsh while hunting.

From my own experience, as well as what I have learned from others, I feel confident that as an "antiperiodic" this drug will be indicated much more frequently in the United States than quinine, and exhibit its peculiar action in a curative manner, not palliative as is most common in the latter substance when exhibited *ex patria.* I have observed that boneset acts more surely in intermittent fever, when the disease was contracted near its habitat, *i. e.*, by streams, ponds, and lakes in the United States east of the 85° west longitude, and north of the 32° north latitude. It may be stated that this is true of most plants used in medicine, and probably accounts for many failures of foreign drugs in domestic diseases: witness Conium, Cinchona, etc., etc.*

The officinal preparation in the U. S. Ph., is *Extractum Eupatorii Fluidum.* In the Eclectic Materia Medica the following preparations are recommended: *Extractum Eupatorii, Infusum Eupatorii,* and *Pilulæ Aloes Compositæ.*

PART USED AND PREPARATION.—The whole fresh plant, gathered just as it is coming into flower, is prepared as in the preceding drug. The resulting tincture is opaque; in thin layers it exhibits a deep, slightly orange-brown color by transmitted light. It has a nauseous, penetrating, bitter, and astringent taste, and imparts a sensation to the tongue very similar to that of ginger; it retains the peculiar odor of the plant, and has an acid reaction.

CHEMICAL CONSTITUENTS.—*Eupatorine.*—This glucoside was extracted from a percolate of the dried tops and leaves of this plant by G. Latin;[5] it was also appreciated in most of the analyses referred to below, but was not isolated, being spoken of as a bitter principle only. Eupatorine is described as a slightly acid, amorphous body, soluble in alcohol and boiling water, yielding a red precipitate when boiled with sulphuric acid, and a white precipitate with the cold acid. Its farther physical and chemical properties are as yet undetermined.

Bitter extractive;[1 2 6 7] Tannin;[1 2 3 4 5 6] Volatile oil;[1 4 5 6] Free acid;[2] Gallic acid;[2] Resin;[2 6 7] Gum;[2 3 5 6 7] Sugar;[1 5 7] and a bitter principle,[2 3 4 5 6 7] have also been

---

* This refers only to drugs exhibited for their physiological or toxic action.

[1] Bigelow, *Am. Med. Bot.*, i, 35. [2] Anderson, *Inaug. Thesis.* [3] Peterson, *Am. Jour. Phar.*, 1851, 206.
[4] Bickley, *ibid.*, 1854, 459. [5] Latin, *ibid.*, 1880, 392. [6] Parsons, 1859, *Rep. to U. S. Com. of Agric.*
[7] Tilden's Analysis, *Jour. of Mat. Med.*, ii, N. S. 243.

determined. The last-named substance is spoken of by some observers as being resinous, others as resinoid, and again as crystallizable. I judge it to have been in all the Eupatorine of Latin, either mixed with some part of the other constituents, or more or less pure.

PHYSIOLOGICAL ACTION.—The symptoms shown by those who have partaken of large doses of an infusion of the tops and leaves, show that this drug causes at first an irritation of the vaso-motor system, followed by a relaxed condition of the capillaries, and an increase of the heart's action, again followed by severe congestion and higher temperature. The symptoms are: Faintness, with loss of consciousness, ending in lethargic sleep; pain, soreness, and throbbing in head; soreness of eyeballs, with sharp pains and photophobia; buzzing in the ears; catarrhal influenza; face red or sallow, and sickly in appearance; tongue white cottony coated; thirst especially preceding the stage of chill; vomiting, especially as the chill passes off; violent colic pains in the upper abdomen; urine dark-colored and scanty, with frequent micturition; oppression of the chest with difficult breathing; stiffness, soreness and deep aching in the limbs, the long bones especially, feel as if pounded or broken; sleepiness, with yawning and stretching, from which the patient awakes with a severe headache; skin bathed in copious sweat. The soreness and deep pains of Eupatorium are most general, and the skin feels numb and as if it would cleave from the bones.

The adaptability of this drug to various forms of disease of paludal origin can readily be understood.

DESCRIPTION OF PLATE 79.

1. Summit of stem, from Greenville, N. J., July 26th, 1879.
2. Flower-head.
3. Floweret.
4. Anther.
5. Fruit.

(2-4 enlarged.)

F.m. ad nat del. et pinxt.

ERÍGERON CANADÉNSE, Linn.

N. ORD.—COMPOSITÆ.

Tribe.—ASTEROIDEÆ.

GENUS.—**ERIGERON,*** LINN.

SEX. SYST.—SYNGENESIA SUPERFLUA.

ERIGERON.

CANADA FLEABANE.

SYN.—ERIGERON CANADENSE, LINN.; E. PANICULATUS, LAM.; E. PUSILLUS, NUTT.; E. STRICTUM, D. C.; SENECIO CILIATUS, WALT.

COM. NAMES.—CANADA FLEABANE, HORSE-WEED, BUTTER-WEED, COLT'S TAIL, PRIDE-WEED, SCABIOUS; (FR.) ERIGERON DE CANADA; (GER.) CANADISCHES BERUFKRAUT.

A TINCTURE OF THE WHOLE PLANT, ERIGERON CANADENSE, LINN.

Description. — This common annual herb grows to a height of from 1 to 4 feet, according to the soil. *Stem* strict, striate, varying from sparsely hispid to almost glabrous; *branches* mostly superior, short, slender, ascending. *Leaves* all sessile, alternate, and more or less ciliate-hispid; the lower often somewhat spatulate, 3-nerved, and sparingly incised; upper leaves linear-lanceolate acute at each end. *Inflorescence* in a more or less dense terminal panicle; *heads* very small, cylindrical, many flowered, and radiate; the *face* flat or hemispherical; *peduncles* and *pedicels* short; *involucre* almost glabrous; *scales* linear-lanceolate, nearly equal, little imbricated, all reflexed in fruit; *receptacle* flat or convex, naked, and pitted. *Ray florets* white, fertile, crowded in a single row, a little exserted and surpassing the branches of the style; *tube*, elongated-cylindrical; *ligule* very short, ascending, 2-toothed. *Disk florets* bisexual; *corolla tubular*, mostly 4-toothed; *filaments* very short, filiform; *anthers* cylindrical, half exserted, not tailed, the connective prolonged at the apex; *style* short, branched; *stigmas* spreading. *Achenia* oblong, flattened, usually pubescent, 2-nerved; *pappus* simple, a single row of capillary bristles.

History and Habitat.—Erigeron is indigenous to the eastern and central belt of North America, where it is common in dry soils, from Canada to Texas; from thence southward, through South America, as far as Argentine Republic. In part to recompense Europe for the miserable dock weeds she has sent us, we have returned her this species, which has now spread through Asia to the sea. It is also introduced in South Africa, Australia, and many of the Pacific islands. It flowers, with us, in July and August, maturing its profusion of parachute-like seeds in autumn.

---

* Ἦρ, *Er*, spring; γέρων, *geron*, an old man; on account of the hoary appearance of some vernal species.

The applicability of a decoction of this herb to many forms of diarrhœa was well known to the Aborigines, and is now used in that disease by the Cree Indians of Hudson Bay. It was introduced in the practice at the New York Almshouse, in 1872, by Dr. Gilbert Smith, for a type of diarrhœa that often prevailed there, and met with very great success.

The decoction has proven tonic, stimulant, astringent and diuretic, and been found useful in dropsies and many forms of urinary disorders, both renal and cystic,—such as gravel, diabetes, dysury, strangury, and urethritis; *E. heterophyllum*, and *Philadelphicum* have, however, greater power than *Canadense* in this direction. The oil of the plant is acrid, and, though not astringent, is, nevertheless an extraordinary styptic; it was introduced by Eclectic practice, and is an efficient agent in the treatment of hemorrhoids, passive hemorrhage, diarrhœa, dysentery, hemoptysis,* hematemesis, hematuria, and menorrhagia; as well as an excellent palliative in the treatment of sore throat, with swelling of the glands, boils, tumors, rheumatism and gonorrhœa. The dose of the oil is from four to six drops in water, repeated not oftener than every hour, if much is to be required.

The officinal preparation of the U. S. Ph., is *Oleum Erigerontis;* in the Eclectic Dispensatory, *Oleum Erigerontis* and *Infusum Erigerontis.*

PART USED AND PREPARATION.—The whole fresh plant, gathered during its flowering season, is treated as in the two preceding species. The resulting tincture has a clear, brownish-orange color by transmitted light; a somewhat aromatic odor; a slightly bitter and astringent taste; and an acid reaction.

CHEMICAL CONSTITUENTS.—No analysis of the plant has yet been made that individualizes the bitter principle first separated by De Puy,† who also determined, in this species, gallic and tannic acids, and an essential oil, and proved that all the qualities of the herb were extracted by cold water or alcohol.

Oil of Erigeron Canadense.—This body may be extracted by distilling the fresh herb with water. It results as a colorless or pale yellow liquid, gradually becoming darker and thicker by age or exposure, and having an aromatic, persistent odor, an acrid taste, and a neutral reaction. It boils at 178° (352.4° F.); has a sp. gr. of from .845 to .850, and is readily soluble in water or alcohol. This oil

* In the autumn of 1883, I was called hastily to attend Miss X. I found her sitting upon the floor, her arm resting upon a chair and her head bending over a common-size foot bath-tub, and every few moments a large quantity of bright red blood would gurglingly issue from her mouth. She had been spitting such quantities for over three-quarters of an hour, and the tub was over half-filled with foamy blood, and, I judge, a large quantity of saliva. I immediately mixed about a drachm of tincture of Erigeron in half a goblet of water, and gave her two teaspoonfuls of the mixture every five minutes, while getting the history of the case. She had been subject to these hemorrhages, which did not occur at the menstrual epoch, for some months past, though they were much less in quantity than the present one. Her family history was consumptive and hemorrhagic, and her physical strength always below medium. The hemorrhage now being arrested (after the second dose) leaving her terribly exsanguinated, I had her removed to her bed, and put her on light liquid food in large quantities. This treatment was followed by Erigeron in a potency for a month, one dose nightly, upon which her strength improved; and, up to the last time I saw her, three years after, no subsequent hemorrhage occurred Her menstrual flux, which had been much too copious and early, was also corrected; and her general health, as she expresses, a thousand times better than at any time since her monthlies commenced.

† *Inq. into Bot. Hist., Chem. Prop., and Med. Qual. Erig. Can.*, 1815.

contains less oxygen than that obtainable from *E. heterophyllum*, and consists mainly of a terpene ($C_{10}H_{16}$), which, after distillation over sodium, boils at 176° (348.8° F.), and has a sp. gr. of .8464 at 18° (64.4° F.).*

PHYSIOLOGICAL ACTION.—The symptoms arising during the experiments of Dr. W. H. Burt,† were mainly as follows: Cephallagia; smarting of the eyes; roughness of the pharynx; soreness of the throat; abdominal distress, and colic; increased urine; aching of back and extremities; and prostration.

DESCRIPTION OF PLATE 80.

1. Inflorescence, Binghamton, N. Y., Aug. 18th, 1886.
2. A portion of the mid-stem.
3. Lower leaf.
4. Flower-head.
5. Ray-floret.
6. Disk-floret.
7. Scale of the involucre.
8. Stamen.
9. Fruit.

(4–9 enlarged.)

* *Am. Jour. Phar.*, 1883, 372 (*Berichte*, 1882, 2854).

† *Am. Hom. Obs.*, 1866, p. 357.

FM. ad nat. del. et pinxt.

INULA HELENIUM, Linn.

Tribe.—SENECIONIDEÆ.

GENUS.—**AMBROSIA,*** TOURN.

SEX. SYST.—MONŒCIA PENTANDRIA.

AMBROSIA ARTEMISIÆFOLIA.

RAG-WEED.

SYN.—AMBROSIA ARTIMISIÆFOLIA, LINN.; A. ELATIOR, LINN.; A. ABSYNTHIFOLIA AND PANICULATA, MICHX.; A. HETEROPHYLLA, MUHL.; IVA MONOPHYLLA, WALT.

COM. NAMES.—RAG-WEED, ROMAN WORMWOOD, CARROT-WEED, WILD OR BASTARD WORMWOOD, HOG-WEED, CONOT-WEED, BITTER-WEED; (FR.) AMBROSIE; (GER.) TRAUBENKRAUT.

A TINCTURE OF THE WHOLE HERB AMBROSIA ARTEMISIÆFOLIA, LINN.

Description.—This annual, pubescent or hirsute weedy-herb, attains a growth of from 1 to 3 feet. *Stem* erect, at first simple, then paniculately branched. *Leaves* opposite and alternate, thinnish, bipinnatifid, or pinnatifidly parted, those of the inflorescence often entire, all smooth above and pale or hoary beneath; *divisions* irregularly pinnatifid or entire. *Flowers* unisexual on the same plant. *Sterile heads* numerous, gamophyllous, arranged in centripetal, racemose spikes, all more or less recurved-pedicelled and not subtended by bracts; *involucre* truncate, saucer-shape or campanulate, not costate but indistinctly radiate veined; *border* irregularly 4 to 6 toothed; *corolla* obconical, the border 5-toothed; *stamens* 5; *filaments* short; *anthers* deltoid, slightly united, their short appendages inflexed; *abortive style* columnar, the apex dilated and penicillate, strongly exserted. *Fertile heads* 1 to 3, apetalous, glomerate in the axils of the upper leaves and below the male spikes; *involucre* open, nutlet-like; *corolla* reduced to a ring around the base of the style; *style* bilamellar, exserted. *Akenes* turgid-ovoid, triangularly compressed, short-beaked, and crowned with from 4 to 6 short teeth or spines; *pappus* wanting.

History and Habitat.—This too-common, truly American weed, is indigenous from Nova Scotia to Saskatchewan, Washington Territory, and southward to Brazil. It habits waste fields, roadsides, and dry places, and blossoms from the latter part of July to October.

The former uses of this plant were but slight, its principal use being as an antiseptic emollient fomentation; its bitterness caused its use in Maryland as a substitute for quinine, but not successfully. J A. Zabriskie, of Closter, N. J.,

* Ἀμβροσια, *ambrosia*, the food of the gods; the gods know why!

claims it to be a successful application to the poisonous effects of Rhus if rubbed upon the inflamed parts until they are discolored by its juice.* Being very astringent, it has also been used to check discharges from mucous surfaces, such as mercurial ptyalism, leucorrhœa, gonorrhœa, and especially in septic forms of diarrhœa, dysentery, and enteritis. It lays some claim also to being stimulant and tonic, and is recognized in the Mexican Pharmacopœia as an emmenagogue, febrifuge, and anthelmintic. Of late years much attention has been called to the species of this genus, especially this and *A. trifida*, as being, through their pollen, the cause of hay fever, many people affected with this troublesome disorder laying the charge direct; certain it is that when the pollenation of the plant is begun the disorder generally commences in those subject to it, and only ceases when the plants are out of flower, unless the patient is able to sojourn to mountain heights out of the limit of their growth. We have had the pleasure of curing two patients of this disease, both of whom had asthmatic symptoms at the height of the trouble, with drop doses of the tincture *tres in dies*.

PART USED AND PREPARATION.—The whole fresh plant, when in the height of its sexual season, should be carefully gathered to retain all the pollen possible, and macerated for fourteen days in twice its weight of absolute alcohol, being kept in a dark, cool place, well corked, and shaken twice a day. The tincture thus prepared should, after pressing, straining, and filtering, have a clear orange-red color by transmitted light; an odor like chocolate; a similar taste, followed by bitterness; and an acid reaction.

CHEMICAL CONSTITUENTS.—This plant has not yet been investigated as to its specific chemical nature; Tannin, and an essential oil, itself uninvestigated, being all we possess of knowledge in this direction.

PHYSIOLOGICAL ACTION.—Ambrosia appears to have a decided irritant action upon mucous membranes, not only by its pollen directly applied, but also upon its ingestion in infusion and tincture. The plant certainly deserves thorough and extended experimentation.

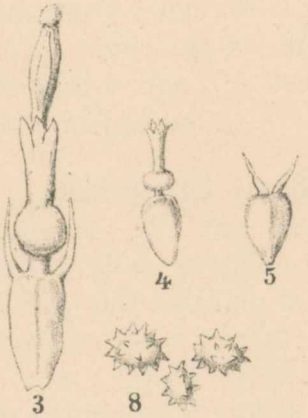
DESCRIPTION OF PLATE 82.

1. Whole young plant, Binghamton, N. Y., Aug. 15th, 1886.
2. A leaf.
3. Male involucre.
4. Face of same, showing sterile flowers.
5. Sterile flower.
6. Sterile style.
7. Stamen.
8. Anther.
9. Female flower.
10. Fruit.
11. Horizontal section of akene.

(3–11 enlarged.)

* *New Rem.*, 1879, 239.

2



3

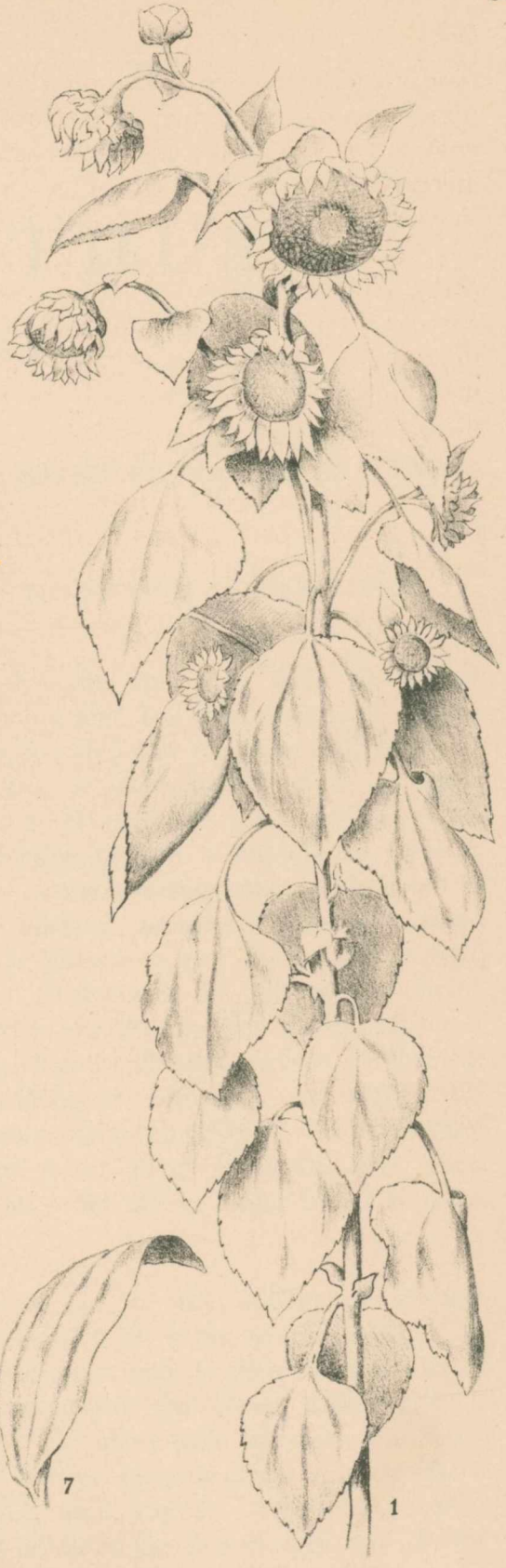
4

5

8

6

7



1

Fm. ad nat. del. et. pinxt.

HELIANTHUS ANNUUS, Linn.

Tribe.—SENECIONIDEÆ.

GENUS.—**HELIANTHUS,*** LINN.

SEX. SYST.—SYNGENESIA FRUSTRANEA.

HELIANTHUS.

SUNFLOWER.

SYN.—HELIANTHUS ANNUUS, LINN.

COM. NAMES.—SUNFLOWER; (GER.) SONNENBLUME; (FR.) LE TOURNESOL.

TINCTURE OF THE RIPE ACHENIA OF HELIANTHUS ANNUUS, LINN.

Description.—This commonly cultivated plant, springing from an annual root, attains a height of from 3 to 18 or more feet, and bears numerous large flower-heads on long peduncles. *Stem* erect, rounded and rough, bearing opposite leaves below and alternate ones above. *Leaves* petioled, broadly ovate or heart-shaped, from 5 to 10 inches long, and 4 to 8 inches broad, rough and conspicuously 3-ribbed. *Peduncles* long, gradually thickening into a funnel-form base at the involucre. *Involucre* composed of ovate aristate, hirsute scales, imbricated in several rows. *Flower-heads* many, nodding, bearing innumerable ray and many disk-florets; they range from 6 to 12 inches in diameter with a flat or convex disk. *Ray-florets* numerous, ligulate and neutral. *Disk-florets*, all perfect and fertile, with short 5-lobed tubes, decemneurate. *Pollen* grains ovate, beset with numerous rows of spines. *Ovary* 1-celled; *style* invested with stiff hairs; *stigma* 2-branched, with subulate appendages. *Achenia* ovate-oblong or cuneiform, somewhat quadrangularly compressed, without margins, each achenium bearing 2 ear-like, chaffy scales, sometimes accompanied by an accessory pair, all of which fall away when the seed is ripe. A description of the natural order will be found under Eupatorium purpureum.

History and Habitat.—The sunflower is one of the natives of tropical America, that has become popular in cultivation in many countries, both on account of its beautiful flowers, whose bright chrome rays, in their many modes of curling and reflexing in a circle about the handsome seal-brown disk, render it attractive as a garden ornament, as well as the many uses to which the seeds are put. From points where it is cultivated it often spreads about in many places by spontaneous growth, blossoming from July until August. The white central pith of the stalk contains nitre; this fact has led to its use as a diuretic, and recommended it also as a form of moxa. The leaves, when carefully cared for and

* ἥλιος, *the sun*, ἄνθος *a flower.*

successfully dried, have been used as a substitute for tobacco in cigars, the flavor of which is said to greatly resemble that of mild Spanish tobacco. The seeds have been extensively used for fattening poultry; fowls eat of these greedily on account of their oily nature. How much a fact it may be that a growth of this plant about a dwelling protects the inhabitants against malarial influences is not yet proven, though strongly asserted by many. An infusion of the stems is claimed to be anti-malarial, and with some forms will probably prove such. A further proving of the tincture is greatly needed, as it would doubtless show an adaptability in this direction. Helianthus has no place in the U. S. Ph. In the Eclectic Materia Medica the infusion of the seeds is used as a mild expectorant, and the expressed oil as a diuretic.

PART USED AND PREPARATION.—The ripe seeds. The seeds when ripe are of a dark purplish color, more or less 4-sided and 4-angled by compression; they are about half an inch in length by one-eighth in breadth. The husk is whitish internally and the kernel sweet, oily and edible. The tincture is made by coarsely powdering the ripe seeds, covering the mass with five parts by weight of dilute alcohol, and allowing it to remain at least eight days in a well-corked bottle, in a dark, cool place, being shaken twice a day. The tincture is then decanted, strained and filtered.

Thus prepared it is by transmitted light a very pale straw-color, has no characteristic taste, and has an acid reaction to litmus-paper.

CHEMICAL CONSTITUENTS.—The analysis of this plant by Wittstein, in 1879, was made exclusive of the seeds, and has therefore no interest to us. The fruit contains by his analysis from twelve to twenty-four per cent. of fixed oil, having a light straw-color, mild taste, and watery consistence, its specific gravity being .926°. It becomes turbid at ordinary temperatures and solidifies at —16.°

Helianthic Acid.—$C_7 H_9 O_4$, in the form of a slightly colored powder, has been extracted from the kernels; it is soluble both in water and alcohol.

PHYSIOLOGICAL ACTION.—Very little or nothing is known of the physiological action of this plant, which would necessarily be slight. It causes dryness of the mucous membranes of the mouth, throat, and fauces, excites vomiting, heat and redness of the skin, and some slight inflammation of the cuticle. A thorough proving of the *whole plant* is greatly to be desired, as without doubt another remedy would be found in it to add to our excellent list for intermittents.

DESCRIPTION OF PLATE 83.

1. Whole plant, seven times reduced, from a cultivated specimen. Binghamton, N. Y., Sept. 8, 1882.
2. Flower head.
3. Floweret (enlarged).
4. Young seed.
5. Mature seed.
6. Scale of involucre.
7. Ray.
8. Pollen grain x 200.

Ç.m. ad nat del. et pinxt.

ÁNTHEMIS NÓBILIS, Linn.

Tribe.—SENECIONIDEÆ.

GENUS.—**ANTHEMIS,*** LINN.

SEX. SYST.—SYNGENESIA SUPERFLUA.

ANTHEMIS NOBILIS.

ROMAN CHAMOMILE.

SYN.—ANTHEMIS NOBILIS, LINN.; A. AUREA, D. C.; CHAMOMILLA NOBILIS, GODR.; CHAMÆMELUM NOBILE, ALL.; ORMENIS NOBILIS, GAY.

COM. NAMES.—TRUE CHAMOMILE, GARDEN CHAMOMILE,† CORN FEVERFEW ‡; (FR.) CHAMOMILE ROMAINE; (GER.) RÖMISCHE KAMILLEN.

A TINCTURE OF THE WHOLE PLANT ANTHEMIS NOBILIS, LINN.

Description.—This low, aromatic perennial, seldom rises to any great height above the ground. *Stems* smooth or slightly pubescent, the sterile creeping, the fertile somewhat ascending; *branches* numerous, hairy. *Leaves* alternate, sessile, pinnately bi- or tri-ternately compound, and dissected into filiform segments. *Heads* heterogamous, many-flowered, and rather large, terminal and solitary upon the branches; *peduncles* long, pubescent; *involucre* hemispherical, consisting of 2 or 3 rows of comparatively small, imbricated bracts, the outer successively shorter; *receptacle* oblong, with blunt, chaffy bracts subtending most of the florets. *Disk-florets* numerous, yellow, bi-sexual; *corolla* tubular, slightly gibbous below, enlarged above to bell-shaped, and having a few oil glands upon its surface; *limb* 5-lobed; *stamens* 5; *anthers* tailless at the base; *style* slender, bifurcated. *Ray-florets* 15 to 20, white, fertile; *ligules* 3-toothed at the apex; *style-branches* stigmatic at their truncate, penicillate extremities. *Akenes* terete, glabrous, marked by 3 indistinct ridges upon their inner faces, the truncate summit naked; *pappus* none, the persistent base of the corolla, however, appearing like a coronal body of that nature.

History and Habitat.—This European immigrant has, as yet, spread but little in this country, it being only occasionally found spontaneous near gardens, where it blossoms in July and August.

On account of many species being nearly related to this one, and the ancient descriptions of so meagre a type, the history of this plant, which has, without doubt, been used as long as any other, is not traceable with any chance of correctness. In later times, however, it has been regarded important, by both physicians and the laity, and judged more active than Chamomilla, which it greatly resembles

---

* Ἀνθεμίς, *anthemis*, a Greek name for some allied plant.

† Our Chamomilla is *Matricaria Chamomilla*, Linn.

‡ Garden Feverfew is *Matricaria Parthenium.*

in its action. As a stomachic tonic and carminative, it has been found useful in atonic dyspepsia, gastro-intestinal irritation, intermittent and typhoid fevers, and colic, and is claimed to be an effectual preventive of incubus. A warm infusion acts as a prompt emetic, emptying the stomach without enervating the system. Fomentations of the steamed leaves make a kindly application in local pains, neuralgic, podagric, uterine, or abdominal. Hot infusions are sudorific and emmenagogue, but are very apt to cause profuse diarrhœa. The oil of the plant is considered anti-spasmodic, useful in hysteric complaints; stimulant, and anti-flatulent; and is often combined with purgative pills, to prevent griping.

The flower-heads are official in the U. S. Ph.; in the Eclectic Dispensatory the preparations are: *Extractum Anthemidis*, *Extractum Anthemidis Fluidum*, *Infusum Anthemidis*, and *Oleum Anthemidis;* it is also a component of *Vinum Symphytii Compositum*.*

PART USED AND PREPARATION.—The fresh-flowering plant is treated as directed for the root of Inula.† The tincture resulting has a light, brownish-orange color by transmitted light; the pleasant, aromatic odor of the bruised plant; a taste at first sourish and pine-apple-like, then bitter; and acid reaction.

CHEMICAL CONSTITUENTS.—From various analyses, this herb has been found to contain a volatile and fixed oil, a resin, tannin, and a bitter principle judged by Flückiger to be a glucoside.

Oil of Anthemis.—This volatile body has a bluish or greenish tint, becoming brownish or yellowish by age. It has a specific gravity of about 0.91, is composed principally of the angelates and valerates of butyl and amyl, and yields the following bodies:

Angelicaldehyde, C_5H_8O, and a hydrocarbon, $C_{10}H_{16}$, having a lemonaceous odor, and boiling at 175° (347° F.).

Angelic Acid, $C_5H_8O_2$.—According to the analysis of Fittig, this body, first discovered in *Angelica Archangelica*, exists in the oil of Anthemis, of which it constitutes nearly 30 per cent. It crystalizes in large, colorless prisms, having a peculiar aromatic odor, and an acid and burning taste. The crystals melt at 45° (113° F.), boil at 191° (375.8° F.), and are soluble in both water and alcohol. By heating this body, with hydriodic acid and phosphorus, to 200° (392° F.), it is converted into valerianic acid.

Tiglic Acid, $C_5H_8O_2$.—This isomer of the above, and of *Methylcrotonic Acid*, was discovered in Croton Oil. It exists, according to E. Schmidt, in company with the above; and it is more than possible that it is identical with it, its boiling point and that of its ethyl-ether being the same. (Flück. and Han., Schorlemmer and Wittstein.)

---

* Comfrey Root, Solomon's Seal, Helonias Root, Chamomile Flowers, Colombo Root, Gentian Root, Cardamom Seeds, Sassafras Bark, and Sherry Wine.

† Page 81–2.

PHYSIOLOGICAL ACTION.—According to the experiments made with the tincture by Dr. Berridge, Anthemis causes the following symptoms of disturbance: Pain and fullness in the head, lachrymation, rawness of the throat, a feeling of warmth in the stomach and desire for food, followed by qualmishness and nausea; some abdominal pain, freeness of the bowels, increased urine; higher heart's action, lassitude, and a general feeling of chilliness.

DESCRIPTION OF PLATE 84.

1. End of a fertile branch, from an escaped garden plant.
2. Ray-floret.
3. Disk-floret.
4. Stamen.
5. Scales of receptacle.
6. Stigmas.
7. Achenium.
8 and 9. Longitudinal section of akene.

(3–9 enlarged.)

Fm. ad nat. del. et pinxt.

ACHILLÈA MILLEFÒLIUM, Linn.

Tribe.—SENECIONIDEÆ.

GENUS.—**ACHILLEA,*** LINN

SEX. SYST.—SYNGENESIA SUPERFLUA.

MILLEFOLIUM.

YARROW.

SYN.—ACHILLEA, MILLEFOLIUM, LINN. ACHILLEA SETACEA, W. & KIT.

COM. NAMES.—COMMON YARROW, MILFOIL, NOSEBLEED; (FR.) MILLEFEUILLE; (GER.) SCHAFGARBE, SCHAFRIPPE.

A TINCTURE OF THE FRESH PLANT ACHILLEA MILLEFOLIUM, LINN.

Description.—This very common roadside herb rises to a height of from 6 to 20 inches, from a slender, creeping, perennial root, which, beside a multitude of filiform rootlets, gives off several long, reddish stolons. The *stem* is simple or nearly so, erect, slightly grooved and roughly hairy. *Leaves* alternate; those from near the root wide-petioled, 2 to 6 inches long; those of the stem proper, shorter, sessile or nearly so, and all in their general outline more or less lanceolate oblong, twice pinnately parted, the divisions linear, crowded and 3 to 5 cleft. *Peduncles* 3 or more; pedicels many, forming small, crowded, flat-topped corymbs at the summit of the plant. *Heads* many-flowered, radiate. *Involucre*, of 2 to 3 imbricated rows of ovoid-oblong scales, with a prominent midrib and brownish, scarious edges. *Rays* 4 or 5, pistillate, with a short, obovate, reflexed limb, more or less 3-lobed. *Disk-florets* 8 to 12, bisexual. *Calyx* limb obsolete. *Corolla* tubular, the summit slightly inflated, 5-lobed, the lobes revolute, acute. *Stamens* 5, inserted upon the tube, and rising slightly above the face of the corolla. *Anthers* adnate, without tails at the base. *Style* long, upright, slender, rising above the anthers. *Stigma* 2-cleft, the divisions recurved and fringed at their tips. *Receptacle* small, usually flat and chaffy. *Achenia* oblong, flattened by compression, shining and slightly margined. *Pappus* none. For a description of the natural order see Eupatorium purpureum, 78.

History and Habitat.—Yarrow is an abundant weed in old, dry pastures, along roadsides and in fields in the northern parts of America, extending in this country, as well as in Western Asia and Europe, high in the colder latitudes. It came to us from Europe, being now fully naturalized. The white or sometimes pink flower-heads blossom all summer. Among the Pah-Ute Indians, according to Dr. Edward Palmer, this plant is much used in decoction for weak and disordered stomachs. Linnæus says, that for a time the Swedes used Yarrow in lieu of hops in the manufacture of beer, and claimed the beer thus brewed to be a greater intoxicant. Millefolium has been dismissed from the U. S. Ph. In the Eclectic practice it is used in an infusion, tincture, or the essential oil.

* The virtues of this genus are said to have been discovered by Achilles.

PART USED AND PREPARATION.—The whole fresh plant should be gathered when flowering begins, excluding all old and woody stems, and chopped and pounded to a pulp; then in a new piece of linen press out thoroughly all the juice and mix it by brisk succussion with an equal part by weight of alcohol. Allow the mixture to stand eight days in a dark, cool place, then filter. The tincture thus prepared should be by transmitted light of a clear reddish-orange color; its odor peculiar, resembling that of malt yeast, pungent and agreeable, like the fresh plant; to the taste acrid and slightly bitter, and shows an acid reaction to test papers.

CHEMICAL CONSTITUENTS.—*Achillein* $C_{20}H_{38}N_2O_{15}$. The body formerly designated by this name was a mixed alcoholic extract of no definite character, containing all of the unvolatilized principles of the plant; from this mass the true alkaloid was isolated by Von Planta and its composition, as above, determined. Achillein has no definite crystalline form; it is soluble in water, alcohol and ether, and has a bitter taste.

Oil of Achillea.—This oil is readily obtained by aqueous distillation of the plant; that from the flowers and green parts of the herb has a beautiful dark blue color and a specific gravity 0.92; that from the achenia is greenish-white, while from the root it is either colorless or slightly yellow. The oil from the green parts, if cold, is of a butter-like consistence, strongly odorous, and with a taste similar to that of the herb itself.

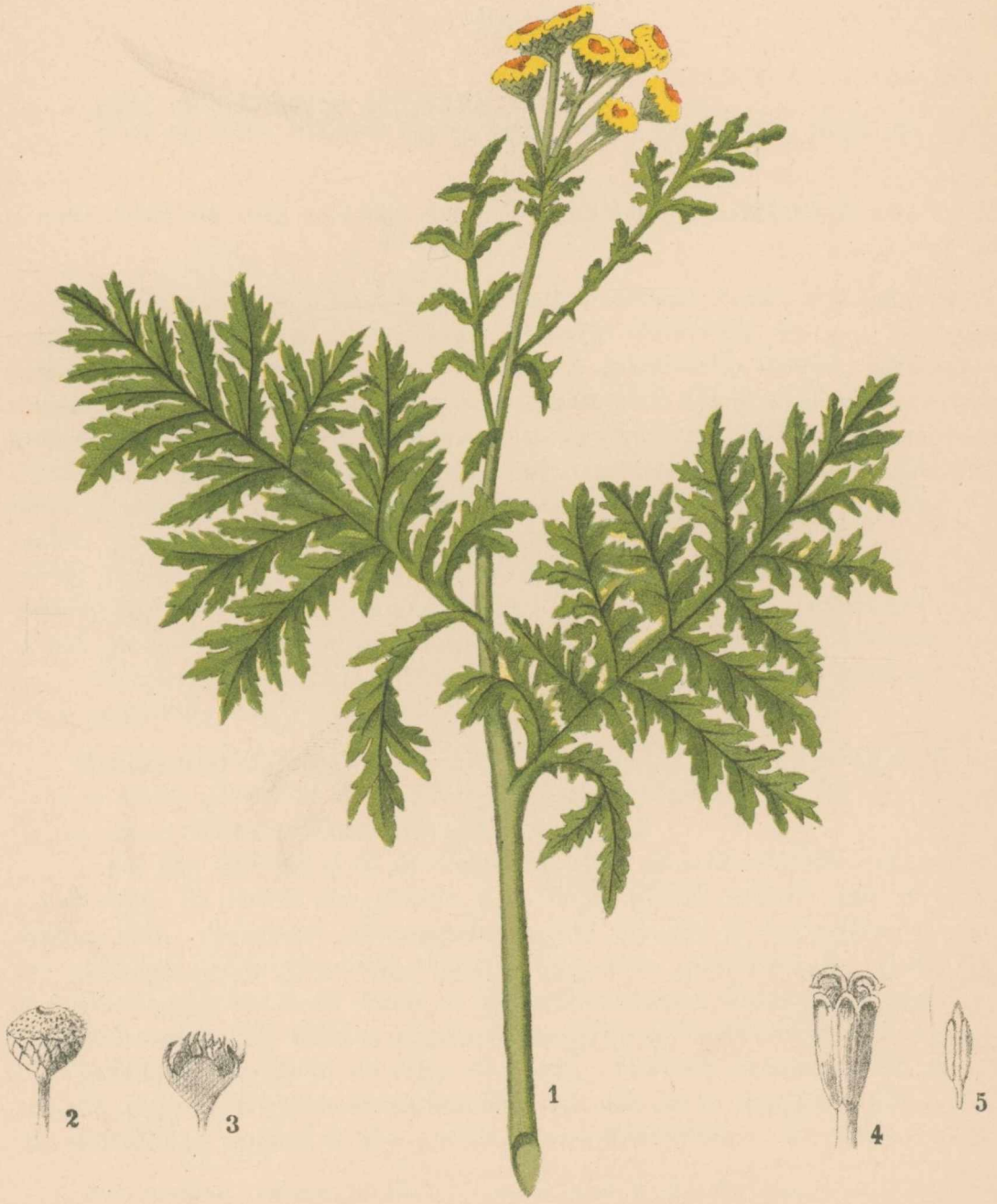
Achilleic Acid.—A strongly acid, odorless, liquid body, with a density of 1.0148 when fully concentrated, crystallizing in colorless quadrilateral prisms, soluble in water. (*Etsupra*, Wittstein.)

The plant contains besides the above principles tannin and a resinoid body uninvestigated. It is considered by Griffith that the plant as naturalized in the Northern United States is more active in its properties than its European progenitors.

PHYSIOLOGICAL ACTION.—Yarrow seems to have a decided action upon the bloodvessels, especially in the pelvis. It has been proven to be of great utility in controlling hæmorrhages, especially of the pelvic viscera, where hæmorrhage is caused by it. Its common European name, Nosebleed, was given from the fact that the early writers claimed hæmorrhage of the nose followed placing its leaves in the nostrils; this may have been either due to its direct irritation, or the use of Achillea ptarmica, its leaves being very sharply serrate and appressed-toothed. Millefolium causes burning and raw sensations of the membranes with which it comes in contact, considerable pain in the gastric and abdominal regions, with diarrhœa and enuresis.

DESCRIPTION OF PLATE 85.

1. Leaf from near the root.
2. Flower-head (enlarged).
3. Ray-floret (enlarged).
4. Top of plant from South Waverly, N. Y., June 8th, 1880.
5. Disk-floret and bract (enlarged).
6. Stamens (enlarged).



F.M. ad nat del. et pinxt.

TANACÈTUM VULGÀRE.

Tribe.—SENECIONIDEÆ.

GENUS.—**TANACETUM,*** LINN.

SEX. SYST.—POLYGAMIA SUPERFLUA.

TANACETUM.

TANSY.

SYN.—TANACETUM VULGARE, LINN.
COM. NAMES.—TANSY OR TANSEY; (FR.) TANAISIE; (GER.) RAINFARN.

A TINCTURE OF THE LEAVES AND FLOWERS OF TANACETUM VULGARE, LINN.

Description.—This robust, acrid-aromatic perennial, grows to a height of from 2 to 3 feet. *Stem* erect, glabrous or somewhat pubescent, leafy to the summit. *Leaves* alternate, 2 to 3 pinnately dissected, glandularly dotted; *divisions* very numerous, confluent, decurrent, incisely-serrate, with many small lobes interposed along the common petiole; *teeth* cuspidate, acuminate. *Inflorescence* capitate, in dense, terminal, corymbiform cymes; *heads* numerous, depressed-hemispherical, heterogamous; *involucre* composed of several imbricated rows of dry, minute scales; *flowers* all fertile, the corollas sprinkled with resinous dots. *Marginal florets* terete, pistillate; *rays* inconspicuous, oblique, 3-toothed. *Disk florets* densely crowded, perfect; *corolla* tubular; *border* 5-toothed; *anthers* tailless, with broad, obtuse tips. *Style* deciduous, the branches truncate with obscure, conical tips. *Pappus* a coroniform, dentately 5-lobed border. *Akenes* 5-ribbed, with a large epigynous disk.

History and Habitat.—This common European plant has escaped from gardens in many places in this country, especially, however, in the more eastern States, where it flowers from July to October.

Tansy has been used in medicine, especially as a carminative tonic, since the middle ages, its use at the present time being almost entirely laic and among country folk. Bergius† recommended a cold infusion of the tops as a tonic in convalescence from exhausting diseases, dyspepsia, jaundice and periodic fevers. A warm infusion has been found to be antihysteric, antiflatulent, carminative and stimulant, and largely used in amenorrhœa, dysmenorrhœa and abdominal cramps. Dr. Clark spoke highly of its relief of gout.‡ Hoffman recommended the seeds in 10 to 40 grain doses as an anthelmintic not inferior to cina, for which action the leaves are often applied to the abdomen as a fomentation. Dr. Clapp speaks of

* Altered from ἀθανασία, *athanasia*, not dying; the name of a genus of Compositæ having the nature of an "everlasting" plant.

† *Mat. Med.*, 664.

‡ *Essays Phys. et Lit.*, *3*, *348*.

the infusion as being almost narcotic, soothing nervous restlessness and often producing quiet sleep.* The hot infusion has also been considered diuretic and diaphoretic, and found useful in dropsy. A fomentation of the leaves is often used with salutary effect in swellings, tumors, local inflammations and dysmenorrhœa. The oil, in doses of from 10 drops to a drachm or more, is one of the most frequently-used abortives by ignorant people—a practice at all times serious and often dangerous; even if desisted in, after one or more attempts, the development of the fœtus is very liable to be interefered with; hemorrhage also often occurs—not so dangerous generally as that following the use of nutmegs, but very often serious.

The leaves and tops are officinal in the U. S. Ph.,—in the Eclectic Materia Medica the preparation relied upon is *Infusum Tanaceti;* it is also a component of *Tinctura Laricis Composita.*†

PART USED AND PREPARATION.—Equal parts of the fresh leaves and blossoms are to be treated as directed under Inula (page 81–2). The resulting tincture, after filtration, should have a clear greenish-orange color by transmitted light; it should retain the peculiar odor and taste of the plant to a high degree; and show an acid reaction.

CHEMICAL CONSTITUENTS.— *Oil of Tansy.* This peculiar yellow, or greenish-yellow volatile oil, possesses fully the odor and taste of the plant; it is lighter than water, its sp. gr. being 0.952; it is soluble in alcohol, and will deposit a camphor on standing.

Tanacetin, $C_{11}H_{16}O_4$.‡—This bitter, amorphous principle is found principally in the flowers; it is soluble both in alcohol and water—most readily, however, in the latter.

Tanacetumtannic Acid, $C_{23}H_{29}O_{31}$. — This specific tannin has also been isolated by Leppig; § of its characteristics I am unacquainted.

Leppig § also found in this species: a resin and gallic, citric, malic, oxalic and meta-arabinic acids.

PHYSIOLOGICAL ACTION.—Many serious, and not a few fatal, cases of poisoning, by oil of tansy, are reported, among which the following will show the sphere of toxic action held by this drug: A young woman had been in the habit of using tansy tea, made from the herb, at nearly every menstrual period, for difficult menstruation. . . On this occasion about two and a half drachms of the oil was poured into half an ordinary tin cupful of water; this, with the exception of a small portion of the water containing about one-half drachm of the oil, was taken at one dose. Convulsions were almost at once produced, and when Dr. Bailey was sent for the patient was unconscious, foaming at the mouth, and in

---

* *Catalogue*, 800.

† See foot-note, p. 33–3.

‡ O. Leppig, *Chem. Zeitung*, 1862, 328 (*Am. Jour. Phar.*, 1885, 288).

§ *Ibid*,

violent tonic spasms, with dilated pupils, frequent and feeble pulse. Constant kneading on the stomach had produced partial emesis, and then ipecac, mustard, and large draughts of hot water, emptied the stomach. Two drachms of magnesia were then given, and a full dose of acetate of morphine; consciousness then returned, no unfavorable symptoms followed, and, after thirty-six hours, without additional medication she was entirely restored.*

A married woman aged 28, accustomed to taking 5-drop doses without inconvenience, took from 15 to 20 drops. Shortly after, she complained of dizziness, agonizing pain in the head and burning in the stomach; a sense of cold numbness crept over her limbs, increasing until it amounted almost to paralysis; convulsions followed, during which she vomited twice, freely, and finally uttered a shriek and fell senseless to the floor. She continued in this comatose condition for over an hour, when, on again vomiting, she recovered consciousness.†

A woman took half an ounce of the oil; the most violent, rigid kind of clonic spasms occurred once in about twelve minutes, coming on generally and instantly, and continuing about one minute. They were attended with slight, if any motion of the arms; it might be called a trembling. The arms were peculiarly affected, and invariably in the same way; they were thrown out forward of, and at right angles with, the body; the hands at the wrists bent at right angles, with the fore-arm supinated, the points of the fingers nearly in contact, the fingers straight and slightly bent at the metatarsophalangeal joints. The muscles of respiration were strongly affected during each paroxysm; air was forced from the chest slowly but steadily, and made a slight hissing noise as it escaped from between the patient's lips. During the intermission of spasm, the muscles were perfectly flexible, and the transition seemed very sudden. The jaws were the only exception to this rule; they were, for the first hour and a quarter, rigidly closed, and were with difficulty opened, but after that were subjected to the same action as the rest of the body—when the spasms were on they were rigid; when off, they were relaxed. After the patient grew weaker, the spasms were more frequent, but had about the same severity and length. Death ensued in two hours.‡

A young woman took two tablespoonfuls of the oil to procure abortion, after which, those who saw her related, that she suffered from symptoms much resembling apoplexy. Two weeks afterward, the vaginal walls of the labia were found inflamed to such extent that one of them resulted in an enormous abscess; the sclerotic coat of the eye was also so congested that it had a dark purple, glassy appearance, and was so badly swollen that the cornea seemed to be depressed.§

A girl aged 21 years, took 11 drachms of the oil to produce an abortion. Total unconsciousness soon followed; at intervals of 5 or 10 minutes the body was convulsed by strong spasms, in which the head was thrown back, the respiration suspended, the arms raised and kept rigidly extended, and the fingers contracted. After this state of rigidity had continued for about half a minute, it was

* Dr. W. W. Bailey, in the *St. Louis Courier of Medicine*, April, 1885.

† A. D. Binkerd, M.D., *Med. and Surg. Rep.*, 1870, 588.

‡ C. T. Hildredth, M.D., *Med. Mag.*, 1834 (*Am. J. of Med. Sci.*, 1835, 256).

§ E. M. Hale, M.D., *West. Hom. Obs.*, 1869, 345.

usually succeeded by tremulous motion often sufficient to shake the room, together with very faint and very imperfect attempts at inspiration. The whole interval, from the commencement of the convulsion to the first full inspiration, varied from a minute to a minute and a half. Respiration was hurried, labored, stertorous, and obstructed by an abundance of frothy mucus, which filled the air passages and was blown from between the lips in expiration; the breath had a strong odor of Tansy. Occasionally the tongue was wounded by the teeth, and the saliva slightly tinged with blood. Immediately after a convulsion the countenance was very pallid and livid, from the suspension of respiration, and the pulse, which, during the spasm, was quite forcible, full and rapid, was now exceedingly reduced in strength and frequency. The pulse and color then gradually returned, until the next spasm came on. It was very common, a few seconds after the termination of a convulsion, for the head to be drawn slowly backward, and the eyelids at the same time stretched wide open, at which times the eyes were very brilliant; pupils of equal size, widely dilated, and immovable; and the sclerotics injected. A little inward strabismus was noticeable, of the right eye, as was, also, occasionally slow, lateral, rolling motion of the eye-balls. The mouth and nose were at times drawn a little to the right side. In the intervals of the convulsions, the limbs were mostly relaxed, but the jaws remained clenched. The skin was warm, but not remarkable as to moisture. The victim died in three hours and a half.*

On Animals.—Dr. Ely Van DeWarker records cases of the action of the oil upon dogs. In one case two drachms were given, causing salivation, vomiting, dilation of the pupils, muscular twitchings, followed by clonic spasms, and a cataleptic condition from which the animal recovered. Recovery also followed a half ounce after the same class of symptoms, but, however, on repeating the dose, the already poisoned animal was plunged into a long and fatal convulsion. Post-mortem examination disclosed the cerebral veins and spinal cord itself highly congested, and serous effusions had taken place in the pia mater. The lungs were found to be engorged, the left heart empty, and the right distended with dark, liquid blood. Congestion of the kidneys had also taken place, and the bladder was found contracted.†

The safe maximum dose of the oil is indeterminable, a few drops only sometimes proving serious.

The symptoms occurring in a number of cases of poisoning and experiments, were substantially as follows: Mental confusion, loss of consciousness; vertigo, with cephalalgia; at first contraction, then wide dilation, of the pupils, staring, immovable eye-balls; ringing in the ears; face congested; roughness of the mouth and throat, difficult deglutition; eructations, nausea, free vomiting, and burning of the stomach; sharp colic pains in the abdomen; diarrhœa; constant desire to urinate—urine at first suppressed, then profuse; respiration hurried and laborious; pulse at first high, then very low and irregular; numbness of

---

* J. C. Dalton, Jr., M.D., *Am. Jour. Med. Sci.*, 1852, p. 136.

† *The Detection of Criminal Abortion.*

the extremities; tonic and clonic spasms, and nervous tremblings; drowsiness and cold sweat. Death appears to ensue from paralysis of the heart and lungs.

DESCRIPTION OF PLATE 86.

1. Summit of an escaped plant, Binghamton, N. Y., July 21st, 1886.
2. A flower-head.
3. A flower-head, longitudinal section.
4. A floret.
5. Anther.

(4 and 5 enlarged.)

Ɛ.m. ad nat del. et pinxt.

ARTEMÍSIA VULGÀRIS, Linn.

Tribe.—SENECIONIDEÆ.

GENUS.—**ARTEMISIA.**

SEX. SYST.—SYNGENESIA SUPERFLUA.

ARTEMISIA VULGARIS.

MUGWORT.

SYN.—ARTEMISIA VULGARIS, LINN.; A. HETEROPHYLLUS, NUTT.; A. INDICA CANADENSIS. BESS.

COM. NAMES.—MUGWORT; (FR.) COURONNE DE ST. JEAN; (GER.) BIFUSS.

A TINCTURE OF THE ROOT OF ARTEMISIA VULGARIS, LINN.

Description.—This perennial herb grows to a height of from 2 to 3 feet. *Stem* erect, furrowed, paniculately branched. *Leaves* mostly glabrous and green above, white-woolly beneath and on the branches, the lower laciniate, the median pinnatifid, the upper lanceolate to linear; *divisions* often cut-lobed or linear-lanceolate. *Inflorescence* glomerate, in open, leafy panicles; *heads* numerous, small, ovoid, heterogamous; *flowers* all fertile; *involucre* mostly oblong, campanulate; *bracts* scarious, sparingly arachnoid, but mostly glabrate. *Corolla* smooth. *Receptacle* naked. Otherwise agreeing in minutiæ of florets and sexual organs with the following species, p. 88.

History and Habitat.—The Common Mugwort is an immigrant from Europe in most of its situations here, but is considered apparently indigenous at Hudson's Bay by Prof. Gray. It is naturalized in Canada and the Atlantic States, where it frequents old fields and gardens, roadsides, and waste places, and flowers from September till October.

Hippocrates very frequently mentions Artemisia as of use in promoting uterine evacuations. Dioscorides and Galen used it as a fomentation for amenorrhœa and hysteria—a practice then in vogue among the women of China. German physicians have urged the drug in epilepsy, but it has nevertheless fallen entirely into disrepute, being now very seldom, if ever, used in any disease.

That torturous, barbaric practice, the use of the Moxa, is closely related to this plant, as it was one of the substances, in connection with *A. Chinensis*, used in the manufacture of that pastile.

The Mexican Pharmacopœia is now, we believe, the only one recognizing this drug.

PART USED AND PREPARATION.—The fresh root is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. After thorough succussion, the whole is poured into a well-stoppered bottle, and allowed to stand eight days in a dark, cool place. The tincture thus prepared should, after straining and filtering, have a deep yellowish-brown color by transmitted light; a characteristic, uncomparable odor—that of the bruised leaves; an aromatic, slightly bitter taste; and an acid reaction.

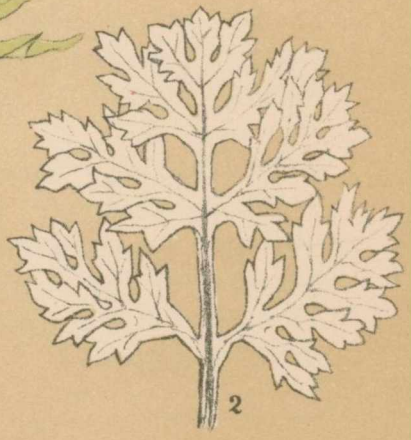
CHEMICAL CONSTITUENTS.—No analysis has, as far as we are able to ascertain, been made of this plant since Baierus found that by fermentation, distillation, and mixture with water, a fragrant sapid liquor was obtained, with a thin fragrant oil upon the surface.

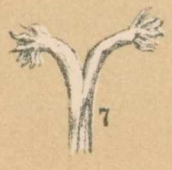
PHYSIOLOGICAL ACTION.—Mugwort is said to cause increase of epileptic spasms; irritation of the nervous system; profuse sweat, having a fetid, cadaverous odor, resembling garlic; violent contractions of the uterus; labor-like pains; prolapsus and rupture of the uterus; miscarriage; metrorrhagia; and increase of lochial discharges.*

DESCRIPTION OF PLATE 87.

1. A portion of a panicle, from Salem, Mass., August 10th, 1885.

* Noak and Trinks.





Fm. ad nat. del. et pinxt.

ARTEMÍSIA ABSÍNTHIUM, Linn.

Tribe.—SENECIONIDEÆ.

GENUS.—**ARTEMISIA,*** LINN.

SEX. SYST.—POLYGAMIA SUPERFLUA.

ABSINTHIUM.†

WORMWOOD.

SYN.—ARTEMISIA ABSINTHIUM, LINN.; ABSINTHIUM VULGARE, PARK.; A. OFFICINALE, LAM.

COM. NAMES.—WORMWOOD; (FR.) ABSINTHE; (GER.) WERMUTH.

A TINCTURE OF THE LEAVES AND FLOWERS OF ARTEMISIA ABSINTHIUM, LINN.

Description.—This bitter, aromatic, frutescent perennial, attains a growth of 2 to 4 feet. *Stem* stiff, almost ligneous at the base and paniculately branched; *branches* of two kinds, some fertile, others barren. *Leaves* alternate, 2 to 3 pinnately parted, finely pubescent with close silky hairs, the uppermost lanceolate, entire; *leaflets* oblong or lanceolate, obtuse and entire, sparingly toothed or incised. *Inflorescence* in long, leafy panicles; *heads* numerous, small, heterogamous, on slender nodding pedicles; *involucre* canescent; *bracts* of two kinds, 1 to 2 loose, narrow, herbaceous ones, and several that are roundish and scarious; *florets* many, all discoid, the central hermaphrodite, the marginal pistillate. *Corollas* tubular glabrous; *limb* nearly entire in the marginal florets, 5-toothed, and spreading in the central. *Style* 2-cleft, in the marginal florets bilamellar, with the inner surfaces stigmatic, in the central bifurcated with only the tips stigmatose, fringed or fimbriate. *Anthers* tipped with an acuminate appendage, not inflexed. *Receptacle* flattish, beset with long woolly hairs; *akenes* obovoid or oblong; *pappus* none.

History and Habitat.—This European synonym of bitterness has escaped from gardens in many places in North America, especially, however, in Nova Scotia, New England, and at Moose Factory, Hudson's Bay. It blossoms with us from the latter part of July to October.

Wormwood has been used in medicine from ancient times. Dioscorides and Pliny considered it to be a stomachic tonic, and anthelmintic. Boerhaave, Linnæus, Haller, and all of the earlier writers speak of its good effects in many disorders, such as, intermittents, hypochondriasis, gout, scurvy, calculus, and hepatic and splenic obstructions. Bergius, in recounting its virtues, says it is "antiputredinosa, antacida, anthelmintica, resolens, tonica, et stomachia." The famous "Port-

* Artemisia, the Greek Diana, goddess of chastity, as the plant was thought to bring on early puberty. Pliny says the name is in honor of Artemisia, queen of Mausolus, king of Caria.

† "Αψίνθιον, *apsinthion*, the classical name of many species of the genus.

land powder," once noted for its efficacy in gout, had this drug as its principal ingredient. A decoction has ever been found a most excellent application for wounds, bruises, and sprains, relieving the pain nicely in most cases; every reader will recall "wormwood and vinegar" in this connection. Latterly it has been found diuretic, discutient, and antispasmodic in epilepsy.

The bitterness of the herb is communicated to the milk of cows who may browse upon it, and also to mothers' milk if the drug be taken.

Brewers are said to add the fruits to their hops to make the beer more heady; and rectifiers also to their spirits. Absinthe forms one of the favorite drinks for those who love stimulating beverages; it is compounded of various aromatics as follows: Green anise (Pimpinella anisi), Star anise (Illicum anisatum), Large absinth (Artemisia absinthium), Small absinth (Artemisia pontica), Coriander (Coriandum sativum), and Hyssop (Hyssopus officinalis); these are distilled together until the distillate comes over reddish, then the following herbs and products are steeped in the distillate to color and flavor it: Peppermint (Mentha piperita), Balm (Melissa officinalis), Citron peel (Citrus medicus), and Liquorice root (Glycyrrhiza glabra).

The leaves and tops of the plant are recognized in the U. S. Ph., and the officinal preparation is *Vinum Aromaticum.** It is officinal in the Eclectic Materia Medica as *Absinthine* and *Infusum Absynthii.*

PART USED AND PREPARATION.—The fresh young leaves and the blossoms are treated as in the preceding species. The resulting tincture is opaque; in thin layers it has a beautiful crimson color; its odor is terebinthic and pleasant; its taste extremely and penetratingly bitter; and its reaction acid.

CHEMICAL CONSTITUENTS.—*Volatile Oil of Wormwood.* This oil, isomeric with camphor, consists principally of *absinthol*, $C_{10}H_{16}O$. It is dark green, acrid, and bitter, retains the odor of the plant, boils at 205° (401° F.), has a sp. gr. of 0.973, and is soluble to almost any extent in alcohol.

Absinthin, $C_{20}H_{28}O_4$.—This bitter principle when first extracted forms in yellow globules, which soon crystallize and become a bitter, neutral, inodorous, friable powder, fusing at 120° (248° F.) to 125° (257° F.). It is soluble in alcohol, slightly also in water, and forms no sugar on decomposing with a mineral acid.

Succinic Acid,† $C_4H_6O_4$.—This acid, together with citric and malic acids, exists in the leaves and fruit of the plant, from which it may be isolated in inodorous, moderately acid, klinorhombic prisms, that fuse at 180° (356° F.), boil at 235° (455° F.), and are soluble in alcohol and twenty-five parts water.

Potassium Chloride, KCl.—This salt has been determined in the plant,‡ from which it may be isolated in yellowish cubes and octahedrons.

---

* One part each of Lavender, Origanum, Peppermint, Rosemary, Sage, and Wormwood.

† Absynthic Acid of Braconnot.

‡ Kunsmuller, *Ann. de Chim.*, vi, 35, from the ash; Claassen, *Am. Jour. Sci.*, 1882, 323, from the extract.

Braconnot also determined a green and a bitter resin, albumen, starch, a tasteless nitrogenized body, a bitter nitrogenized body, and nitre.*

PHYSIOLOGICAL ACTION.—A druggist's clerk took about half an ounce of the oil; he was found on the floor perfectly insensible, convulsed, and foaming at the mouth; shortly afterward the convulsions ceased, the patient remained insensible with the jaws locked, pupils dilated, pulse weak, and stomach retching. After causing free emesis and applying stimulants the man recovered, but could not remember how or when he had taken the drug. According to Dr. Legrand, the effects prominent in absinthe drinkers are: Derangement of the digestive organs, intense thirst, restlessness, vertigo, tingling in the ears, and illusions of sight and hearing. These are followed by tremblings in the arms, hands, and legs, numbness of the extremities, loss of muscular power, delirium, loss of intellect, general paralysis, and death. Dr. Magnan, who had a great number of absinthe drinkers under his care, and who performed many experiments with the liquor upon animals, states that peculiar epileptic attacks result, which he has called "absinthe epilepsy." †

Post-Mortem.—Great congestion of the cerbro-spinal vessels, of the meninges of the brain, extreme hyperæmia of the medulla oblongata, injection of the vessels of the cord, with suffusion of the cord itself. The stomach, endocardium, and pericardium show small ecchymoses.‡

DESCRIPTION OF PLATE 88.

1. End of a flowering branch, escaped at Binghamton, N. Y., Aug. 10th, 1885.
2. A lower leaf.
3. Flower head.
4. Marginal floret.
5. Central floret.
6. Anther.
7. Style of central floret.

(3–7 enlarged.)

---

* Thomson, *Organic Chem.*, 1838, 864.

† *Et supra, Taylor On Poisons*, 1885, 652.

‡ *Jour. of Physiological Med.*, 9, 525; in Allen, *Ency. Mat. Med., loc. cit.*

Fm. ad nat. del. et pinxt.

GNAPHÀLIUM POLYCÉPHALUM, Michx.

Tribe.—SENECIONIDEÆ.

GENUS.—**GNAPHALIUM,*** LINN.

SEX. SYST.—SYNGENESIA SUPERFLUA.

GNAPHALIUM.

EVERLASTING.

SYN.—GNAPHALIUM POLYCEPHALUM, MICHX.; G. OBTUSIFOLIUM, LINN.; G. CONOIDEUM, LAM.

COM. NAMES.—FRAGRANT EVERLASTING, LIFE EVERLASTING, OLD FIELD BALSAM, WHITE BALSAM, INDIAN POSEY, CAT FOOT, SILVER LEAF, NONE-SO-PRETTY; (FR.) IMMORTELLE, LE COTONNIÈRE; (GER.) IMMERSCHÖN RUHKRAUT.

A TINCTURE OF THE WHOLE PLANT GNAPHALIUM POLYCEPHALUM, MICHX.

Description.—This persistent, annual herb, usually grows to a height of from 1 to 3 feet. *Stem* erect, terete, and floccose-woolly; *branches* numerous at the summit, either glabrous or minutely viscid-pubescent when the wool is off. *Leaves* alternate, closely serrate or slightly amplexicaul, but never decurrent, somewhat aromatic, thinnish, all lanceolate or linear, narrowed at the base, and mucronately acute or acuminate at the tip, soon bare and green, or viscid-puberulent above; *margins* entire, often finely undulate. *Inflorescence* in terminal-paniculate, or cymose, glomerules; *heads* numerous, ovate-conoidal before expansion, then obovate, all discoid and heterogamous; *involucre* woolly only at the base; *bracts* oblong, obtuse, thin, dull white, becoming somewhat rusty-colored, pluriserially-imbricate, without tips or appendages; *receptacle* flat, chaffless, and bractless. *Flowers* fertile throughout, arranged in several rows; *corona* filiform-tubular, shorter than the style; *anthers* with slender tails. *Hermaphrodite flowers*, very few; *styles* two-cleft, the branches mostly truncate. *Akenes* terete, lightly 3- to 4-nerved, smooth and glabrous; *pappus* a single row of scabrous, capillary bristles, each free at the base and falling separately.

History and Habitat.—This species is indigenous to North America, where it ranges from Florida and Texas northward to Canada and Wisconsin. It grows upon old fields and in quite open, dry woods, and blossoms from July to October.

The Everlastings formed a part of aboriginal medication, and from there they descended to the white settlers, who, in conjunction with the more or less botanic physicians, used them about as follows: The herb, as a masticatory, has always been a popular remedy, on account of its astringent properties, in ulceration of the

* Γνάφαλον, *gnaphalon*, a lock of wool; from the floccose appearance of any torn or broken end.

mouth and fauces, and for quinsy. A hot decoction proves pectoral and somewhat anodyne, as well as sudorific in early stages of fevers. A cold infusion has been much used in diarrhœa, dysentery, and hemorrhage of the bowels, and is somewhat vermifugal; it is also recommended in leucorrhœa. The fresh juice is considered anti-venereal. Hot fomentations of the herb have been used like Arnica, for sprains and bruises, and form a good vulnerary for painful tumors and unhealthy ulcers. The dried flowers are recommended as a quieting filling for the pillows of consumptives.

Of *Antennaria plantaginifolia*, Hook. (Gnaphalium plantaginifolium, Linn.), Rafinesque says: "For a small fee, the Indians, who call this plant *Sinjachu*, will allow themselves to be bitten by a rattlesnake, and immediately cure themselves with this herb."

Gnaphalium is not officinal in the U. S. Ph.; in the Eclectic Dispensatory, the preparation recommended is: *Infusum Gnaphalii.*

PART USED AND PREPARATION.—The whole fresh plant, gathered when the flowers are still young, should be treated as directed for the root of Inula.* The resulting tincture should have a brownish-orange color by transmitted light; a pleasant, slightly balsamic odor; a taste at first aromatic, then bitter; and an acid reaction.

CHEMICAL CONSTITUENTS.—No analysis to determine the character of the bitter principle has been made. The herb contains a little resin, a volatile oil, a bitter principle, and tannin; and yields all its sensible qualities to both water and alcohol.

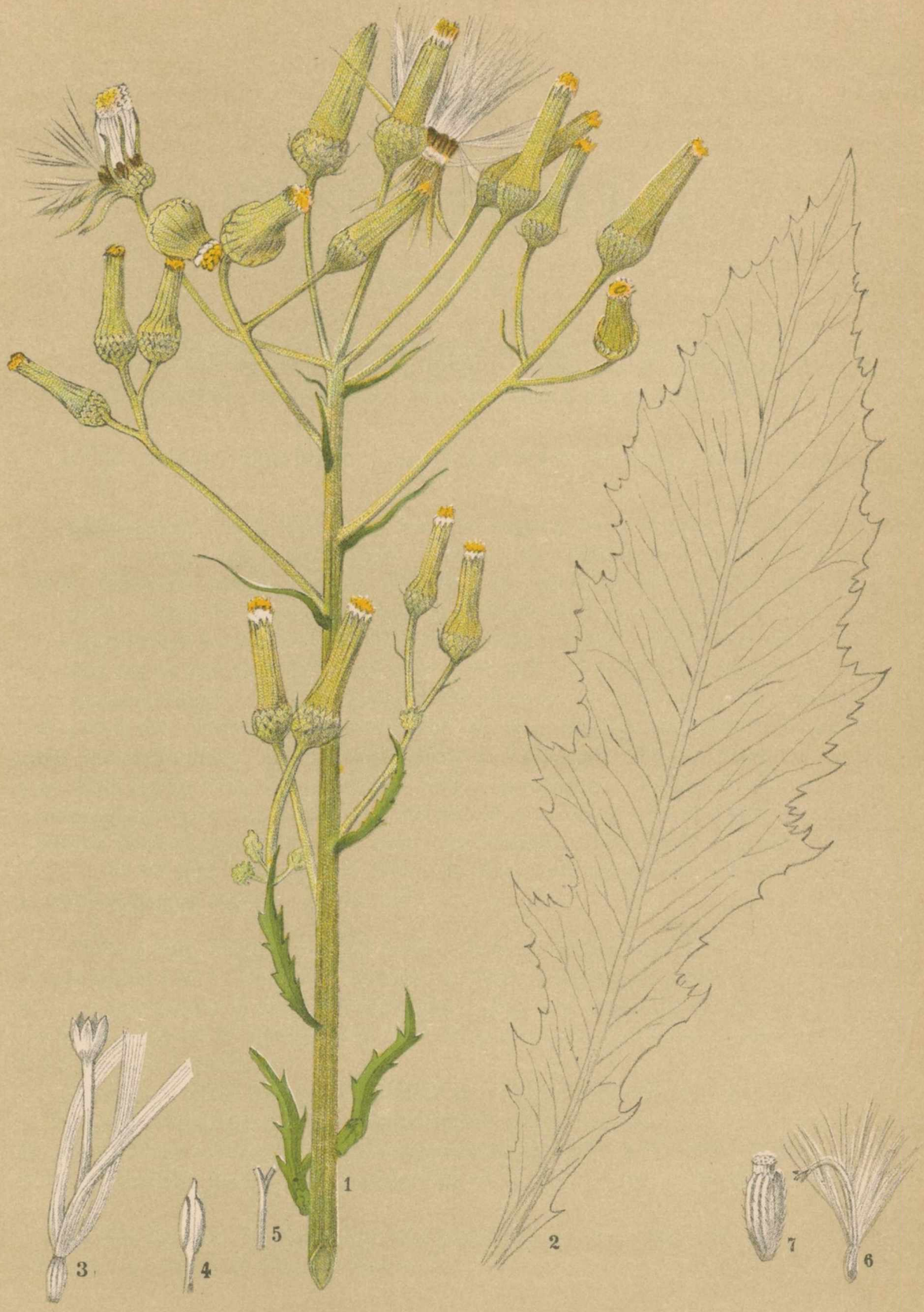
PHYSIOLOGICAL ACTION.—The symptoms following the ingestion of from 15 drops to a half ounce of the tincture, at the hands of Dr. Woodbury,† were essentially as follows: Slight abdominal griping, vomiting and purging; profuse diarrhœa, dark-colored offensive passages. Experiments with small doses of the triturated dry flowers and leaves, at the hands of Dr. Banks,‡ corroborated the above symptoms, though the result was less severe, and gave the following symptoms beside: Giddiness, especially on rising; dull, heavy expression of countenance; diminished appetite; rumbling of flatus, increased urine; sexual excitement; intense sciatic pain; weakness, and languor.

DESCRIPTION OF PLATE 89.

1. Summit of plant, Binghamton, N. Y., Aug. 10th, 1886.
2. A leaf (from a plant gathered by Chapman in Florida).
3. Outer } scale of involucre.
4. Inner }
5. Floret.
6. Stigmas.
7. Seed.

(3–7 enlarged.)

* Page 81–2. † *Trans. Mass. Hom. Soc.* ‡ *N. A. Jour. Hom.*, 7, 383.



F.m. ad nat del. et pinxt.

ERECHTHÌTES HIERACIFÒLIA, Rat.

Tribe.—SENECIONIDEÆ.

GENUS.—**ERECHTHITES,*** RAF.

SEX. SYST.—SYNGENESIA SUPERFLUA.

ERECHTHITES.

FIREWEED.

SYN.—ERECHTHITES HIERACIFOLIA, PREALTA, AND ELONGATA, RAF.; SENECIO HIERACIFOLIUS, LINN.; CINERARIA CANADENSIS, WALT.
COM. NAMES.—FIREWEED; (FR.) HERBE DE FEU; (GER.) FEUERKRAUT.

A TINCTURE OF THE WHOLE PLANT ERECHTHITES HIERACIFOLIA, RAF.

Description.—This rank, glabrous, or slightly hairy annual, usually grows from 1 to 7 feet high. *Stem* stout, erect, virgate, sulcate, and leafy to the top. *Leaves* alternate, sessile, tender, and thin, all narrowly or broadly lanceolate and acute; *margins* sharply denticulate or somewhat pinnately incised; *bases* of the upper leaves somewhat auriculate and partly clasping. *Inflorescence* in a loose, terminal, corymbose panicle; *heads* about one-half inch long, cylindraceous, heterogamous, and discoid; *involucre* a single row of erect, linear, acute scales; *bracteoles* few, setaceous; *flowers* numerous, white, or ochroleucous, the outer female, the inner hermaphrodite. *Corollas* all slender and tubular. *Female florets:* corolla-tube filiform, the limb slightly dilated, and 2- 4-toothed. *Hermaphrodite flowers:* corolla-tube filiform, the limb short, cyathiform, 4- 5-lobed. *Anthers* tailless. *Style-branches* narrow, tipped with a conical pubescence. *Receptacle* flat and naked. *Pappus* white and copious; *bristles* soft, fine, and elongated. *Akenes* oblong, somewhat striate, tapering at the end.

History and Habitat.—This coarse, homely, indigenous weed ranges from Newfoundland and Canada southward to South America; it grows in moist, open woods, upon enriched soil, and blossoms in July and September. Its vulgarism, Fireweed, is given it on account of its seeking newly-burned fallows, there growing in its greatest luxuriance.

The whole plant is succulent, bitter, and somewhat acrid, and has been used by the laity principally as an emetic, alterative, cathartic, acrid tonic, and astringent, in various forms of eczema, muco-sanguineous diarrhœa, and hemorrhages. The oil, as well as the herb itself, has been found highly serviceable in piles and dysentery.

In the Eclectic Dispensatory, the preparations recommended for use are: *Oleum Erechthiti* and *Infusum Erechthiti.*

* Derived from the ancient name of some troublesome groundsel.

PART USED AND PREPARATION.—The whole fresh, flowering plant is treated as recommended for the next drug.*

The resulting tincture has a clear, beautiful, reddish-orange color by transmitted light; a sourish odor, resembling that of claret wine; a taste at first sourish, then astringent and bitter; and an acid reaction.

CHEMICAL CONSTITUENTS.—In all probability, the principal virtues of the plant reside in its peculiar volatile oil, though no analysis to determine other bodies has been made.

Oil of Erechthites.—This fluid, transparent, yellowish oil, is obtained by distilling the plant with water. It has a strong, fetid, peculiar, slightly aromatic odor, and a bitterish, burning taste. Its sp. gr. is 0.927. It is soluble in both alcohol and ether. According to Beilstein, and Wiegand,† it consists, almost exclusively, of terpenes, boiling between 175° and 310° F. (79.5°–154.4°).

PHYSIOLOGICAL ACTION.—The symptoms of disturbance caused by doses of from 12 to 200 drops of the tincture, at the hands of T. J. Merryman,‡ were in substance as follows: Uneasiness approaching nausea; griping in the bowels, followed by three copious, yellow, mushy, fecal stools, followed again by constipation; increased flow of urine, containing a large amount of mucus; stimulation of the genital organs, followed by erections; and pains in the extremities.

DESCRIPTION OF PLATE 90.

1. Summit of plant, Binghamton, N. Y., Aug. 27th, 1886.
2. A middle leaf.
3. A floret.
4. Stamen.
5. Stigmas.
6. Fruit.
7. Akene.

(3–7 enlarged.)

* Senecio, page 91–2.

† *Berichte*, 1882, 2854; *Am. Jour. Phar.*, 1833, 372.

‡ E. M. Hale, *Trans. Hom. Med. Soc., N. Y.*, 1868, 78.

Ç.m. ad nat del. et pinxt.

SENÈCIO AÙREUS Linn.

Tribe.—SENECIONIDEÆ.

GENUS.—**SENECIO,*** LINN.

SEX. SYST.—SYNGENESIA SUPERFLUA.

SENECIO.

GOLDEN RAGWORT.

SYN.—SENECIO AUREUS, LINN.; SENECIO GRACILIS, PURSH.; SENECIO FASTIGIATUS, ELL.

COM. NAMES.—GOLDEN RAGWORT, GROUNDSEL, SQUAW-WEED, LIFE-ROOT, FALSE VALERIAN, GOLDEN SENECIO, FEMALE REGULATOR, FIREWEED,† UNKUM; (FR.) SENEÇON; (GER.) GOLDENES KREUZKRAUT.

A TINCTURE OF THE ENTIRE, FRESH, FLOWERING PLANT, SENECIO AUREUS, LINN.

Description.—This early spring perennial, usually attains a growth of about 1 or 2 feet. *Root* small, thin, horizontal; *rootlets* numerous, slender. *Stem* usually free of woolliness at the flowering season, floccose woolly when young. *Leaves* alternate; *radical leaves* on long, slender petioles, *blade* mostly rounded and undivided, *base* somewhat truncate or almost cordate, *margin* crenate, under surface pinkish-purple; *cauline leaves*, lowermost similar to the root-leaves with the addition of 2 or 3 lobelets opposite along the petiole, *blade* subcordate, crenate, pinkish beneath; *middle leaves* lyrately divided and passing gradually to laciniate-pinnatifid, *bases* semi-auriculate, clasping; *superior leaves* linear-lanceolate, linear, sessile, and lastly bracteolate. *Inflorescence* numerous superior-axillary and finally corymbose, long-peduncled, ray-bearing heads; *heads* radiate, many-flowered; *receptacle* flat and naked. *Ray florets* 8–12, conspicuous, ovoid, pistillate. *Disk florets* numerous, perfect, tubular; *corolla* 5-lobed; *lobes* revolute, obtuse. *Involucre* of a few lanceolate scales arranged in a single row; *pappus* of many, soft, capillary bristles. *Anthers* tailless. *Style* bifurcated; *stigmas* recurved. *Akenes* quite glabrous or only microscopically hairy on the angles, neither rostrate nor winged. Read description of the order, under Eupatorium purpureum, 78.

History and Habitat.—The Golden Ragwort is common everywhere, the primary form mostly in swampy spots and on the wet borders of streams. It flowers from May until June.

Like many another of our partially-proven plants, the medical history is very superficial. Senecio has been found useful in Aboriginal medicine as an anti-

* The old Latin name for the plant, from *senex*, an old man, on account of the hoary pappus. This large and widely-distributed genus contains in North America 57 species and 15 varieties, all but 3 of which are indigenous; of the varieties, 6 belong to *S. aureus*.

† The true fireweed is *Erechthites hieracifolia, Raf.* (90).

hemorrhagic, abortivant and vulnerary. Later it has been recommended as a substitute for ergot, as an excellent drug to control pulmonary hemorrhage, generally as a diuretic, pectoral, diaphoretic, tonic, and a substance to be thought of in various forms of uterine trouble.

The plant has no place in the U. S. Ph. The officinal preparations in the Eclectic Materia Medica are: *Decoctum Senecii*, *Extractum Senecii Fluidum*, and *Senecii Oleo-resinæ*.

PART USED AND PREPARATION.—The entire, fresh, flowering plant, is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-sixth part of it, and the rest of the alcohol added. After having stirred the whole, pour it into a well-stoppered bottle, and let it stand eight days in a dark, cool place.

The tincture, separated from this mass by filtration, has a brownish-orange color by transmitted light, the peculiar odor of the bruised herb, a sweetish then slightly bitter taste, and a strong acid reaction.

CHEMICAL CONSTITUENTS.—*Senecin*, an arbitrary oleo-resin, of unknown constitution. No analysis of the plant has been made, as far as I can determine.

Upon adding the tincture to water a decided deposit of resin takes place, and tincture of iron shows the presence of tannin, even in a mixture of four drops of the drug-tincture in a drachm of alcohol.

PHYSIOLOGICAL ACTION.—We have several provings of this drug, but its action is not determinable from them.

DESCRIPTION OF PLATE 91.

1. Whole plant, Ithaca, N. Y., May 24th, 1880.
2. Disk floret (enlarged).
3. Ray floret (enlarged).

Fm. ad nat. del. et pinxt. LÁPPA OFFICINÀLIS, VAR. MÀJOR, Gray.

Tribe.—CYNARODEÆ.

GENUS.—**ARCTIUM**,* LINN.

SEX. SYST.—SYNGENESIA POLYGAMIA ÆQUALIS.

LAPPA.†

BURDOCK.

SYN.—ARCTIUM LAPPA, LINN.; A. MAJUS, SCHK.; LAPPA OFFICINALIS, ALLIONI; L. MAJOR, GÆRTN.; L. OFFICINALIS, VAR. MAJOR, GRAY; BARDANA MAJOR, GER.

COM. NAMES.—COMMON BURDOCK, CLOTBUR;‡ BAT WEED; (FR.) GLOUTERON, BARDANE; (GER.) KLETTE.

A TINCTURE OF THE FRESH ROOT OF ARCTIUM LAPPA, LINN.

Description.—This coarse, rank, biennial emigrant, grows to a height of about 3 or 5 feet. *Root* deep, sub-cylindrical, almost black externally and white within. *Stem* stout; *branches* numerous, widely spreading. *Leaves* alternate, ample, orbicular-cordate, unarmed; green and smooth above, whitish cottony beneath, all marked with prominent, crimson veins; *petioles* stout, those of the lower leaves deeply channelled upon the upper side. *Inflorescence* somewhat cymose or clustered; *heads* many flowered, homogamous, tubulifloral, hermaphrodite; *involucre* globular, strongly imbricate; *bracts* all spreading, coriaceous, and nearly smooth, divided into three portions from below upward, viz.: *base* dilated appressed, with a ridge marking its outer median line, the edges somewhat serrated; *arista* long, slender and smooth, the apex coverted into a strongly incurved *hook* of a horny consistence, sharp and transparent. *Corolla* pink, equally or somewhat unequally five-cleft; *lobes* long, narrow, and acute. *Stamens* exserted, united by their anthers (except the tips) into a purple tube enclosing the style; *filaments* smooth, distinct; *anthers* tailed at the base and furnished with an elongated, connate, cartilaginous apex. *Style* long, filiform, thickened at the apex where it bifurcates into partly distinct, slender, smooth branches without appendages, and stigmatic to the apex on the inner side. *Receptacle* flat or convex, densely setose. *Akenes* somewhat bony, inversely pyramidal, transversely wrinkled, and attached by the very end of the pointed base; *pappus* composed of numerous, short, rigid, barbellate bristles, which are finally separately deciduous.

---

* Ἄρκτος, *arktos* (Celtic *arth*), a bear, from a fancied resemblance in the rough, shaggy, fruiting heads.

† Λαβεῖν, *labein*, to lay hold of, Celtic *llap*, a hand, signifying the tenacious hold the burr takes upon fabrics and the coats of animals. Ray says (*Hist.*, 232; *Syn.*, 196), Lappa dici potest vel απο τυ λαβειν prehendere vel λαπτειν lambere.

‡ The clotburs are properly species of *Xanthium*.

History and Habitat.—This common weed is indigenous to Europe and Asia, growing there as here—about roadsides and dwellings. Since its introduction into this country it has spread rapidly westward, its seeds being numerous and readily carried about by both man and animals. It flowers from June to October. The herb is so rank that man, the jackass, and caterpillar are the only animals that will eat of it. The young stems, stripped of their rind, may be eaten raw or boiled, as a salad with oil, or a potage with vinegar. (Withering.)

The previous uses of this plant have been a decoction of the root in pulmonary catarrh, rheumatism, gout; and a depurant in scrofula, scurvy, venereal eruptions, lepra, and kindred affections, in which it is even now considered better in many cases than sarsaparilla. It is also diuretic. The powdered seeds have been used as a diuretic, and application for the cure of styes. Woodville says* that he "never had an opportunity of observing the effects of the root, except as a diuretic, and in this way we have known it succeed in two dropsical cases, where other powerful medicines had been ineffectually used; and as it neither excites nausea or increases irritation, it may occasionally deserve a trial where more active remedies are improper."

The root is officinal in the U. S. Ph.; in the Eclectic Materia Medica the following preparations are given: *Infusum Arctii; Extractum Arctii;* and *Syrupus Araliæ Compositus.*†

PART USED AND PREPARATION.—The fresh root gathered in Autumn, before the frost has touched the plant deeply, should be chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp well mixed with one-sixth part of it, and the rest of the alcohol added. After the whole has been thoroughly stirred, pour it into a well-stoppered bottle and allow it to stand eight days in a dark, cool place.

The tincture, separated from this mass by filtration, should be clear and transparent. It should have a slighly brownish-orange color by transmitted light, and an acid reaction. This tincture gives no odor or taste by which it may be identified.

CHEMICAL CONSTITUENTS.—*Lappine.*—This peculiar bitter principle was discovered by Messrs. Trimble and Macfarland,‡ and judged by them an alkaloid, as it answered to several of the alkaloid tests. It is described as an amorphous, intensely bitter body, with a faintly alkaline reaction. Its solubility and peculiar physical properties are as yet uninvestigated; it cannot, however, be soluble in cold alcohol to any great extent, as our tincture does not show its presence, at least to the taste.

Oil of Lappa.§—This fixed oil exists in the seeds in the proportion of 15.4 per cent. It is yellow, bland, not soluble in cold alcohol, and has a sp. gr. of .930.

---

* *Med. Bot.*, i, 34.

† Containing *Aralia Spinosa* and *nudicaulis* (root), Sassafras (root bark), Rumex crispus (root), Burdock (root), Sambucus (flowers), Guaiacum (wood), and Iris (root).

‡ *Am. Jour. Phar.*, 1885, p. 127.

§ Ibid.

Inulin,* tannin, a gummy extractive, nitrate of potash,† a resin soluble in water, and another in alcohol, have been determined.

PHYSIOLOGICAL ACTION. — The only symptom of importance so far recorded from the action of this drug, is an increased secretion of milky urine, with frequent desire and copious discharges.

DESCRIPTION OF PLATE 92.

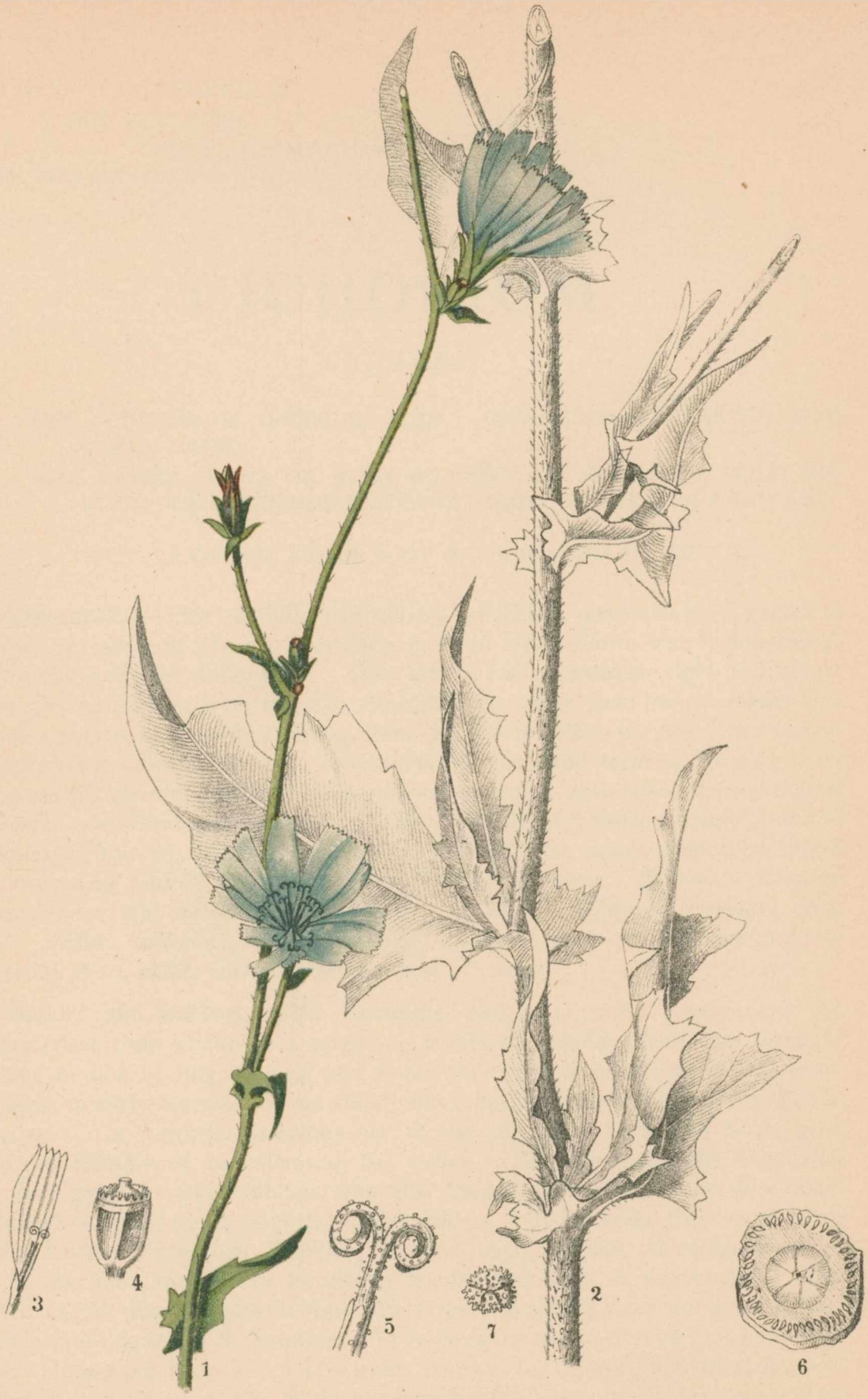
1. A flowering branch, Binghamton, N. Y., August 1st, 1884.
2. Floweret.
3 and 4. Bract.
5. Seed.
6. Bristle of Pappus.
7. A thoroughly dried horn.

(2–7 enlarged.)

---

* See under Inula Helenium, 81.

† Loudon says that the mature green herb, when burnt, will yield fully one-third its quantity of a pure, white, alkaline salt equal to the best potash.



Fm. ad nat. del. et pinxt.

CICHÒRIUM ÍNTYBUS, Linn.

S. ORD.—LIGULIFLORA.

GENUS.—**CICHORIUM,*** TOURN.

SEX. SYST.—SYNGENESIA POLYGAMIA ÆQUALIS.

CICHORIUM.

CHICCORY.

SYN.—CICHORIUM INTYBUS, LINN.; CICHORIUM SYLVESTRE SIVE OFFIC. BAUH.

COM. NAMES.—WILD OR BLUE SUCCORY OR CHICCORY, WILD ENDIVE; (FR.) CHICOREÉ SAUVAGE; (GER.) CICHORIE, WEGEWART.

A TINCTURE OF THE FRESH ROOT OF CICHORIUM INTYBUS, L.

Description.—This partially naturalized, branching, perennial herb, grows to a height of from 2 to 4 feet. *Root* deep, more or less fusiform, woody, branching, and surcharged with milky juice. *Stem* bristly, hairy; *branches* rigid and stout; *leaves* alternate, those from the root runcinate, the lower stem leaves oblong-lanceolate, dentate, and partly clasping, those on the branches varying from auriculate-lanceolate to mere bracts. *Inflorescence* axillary and terminal heads; *heads* 2 or 3 sessile, several-flowered, homogamous, or single and raised upon a hollow peduncle. *Involucre* double, the outer row composed of 5 short, spreading scales; the inner of 8 or 10. *Flowerets* all ligulate and perfect; *ligules* 5-toothed, bright blue, becoming pinkish, then whitish, as the day advances. *Stamens: filaments* white, slender, and unconnected; *anthers* deep blue. *Stigmas* 2, circinate, dark blue. *Akenes* turbinate, striate, angular, and glabrous; *pappus* composed of numerous short, chaffy scales, forming a sort of crown.

History and Habitat.—This European emigrant grows chiefly near the eastern coast, from whence it is spreading somewhat inland. It flowers throughout the months of July, August, and September. Its blossoms present a beautiful sight in early morning or on cloudy days, but fade and wither during bright sunshine. The principal previous use of this plant has been that of the root as an adulteration of, or substitute for, coffee. This use, it appears, originated with the Egyptians and Arabians, who also used the bleached leaves as a salad, the boiled or baked roots as pottage, and made a flour for bread from them when dried. Endive (*Cichorium Endivia*), so much used in many countries as salad, was at one time thought to be merely a cultivated state of this species. The specific names Endivia and Intybus both appear to spring from the same Arabic word designating the herb, *hendibeh*. As regards the use of chiccory, Dickens says in his "Household Words:" "The great demand for chiccory has led to its very extensive cultivation in this country; considerable sums of money have been

* The Latinized Arabian name *Chickouryeh*.

expended on the kilns and machinery required to prepare it for the markets, and a large amount of capital is profitably employed upon this branch of English agriculture. . . . The bleached leaves are sometimes used as a substitute for endive, and are commonly sold as an early salad in the Netherlands. If the roots, after being taken up, be packed in sand in a dark cellar, with their crowns exposed, they will push out shoots, and provide through the winter a very delicate blanched salad, known in France as *Barbe de Capucin*. When chiccory is to be used for coffee the roots are partly dried, cut into thin slices, roasted and ground. The ground chiccory thus made is used by many poor upon the continent as a substitute for coffee by itself. It has not, of course, the true coffee flavor, but it makes a rich and wholesome vegetable infusion of a dark color, with a bitterish, sweet taste, which would probably be preferred by a rude palate to the comparatively thin and weak, and at the same time not very palatable infusion of pure coffee of the second and third quality. By the combination of a little chiccory with coffee the flavor of the coffee is not destroyed, but there is added to the infusion a richness of flavor and a depth of color—a body—which renders it to many people much more welcome as a beverage than pure coffee purchased at the same price." In times of scarcity chiccory certainly would make a better substitute than many other substances used, as, for instance, during the war of the Rebellion, when—especially in the South—beans, peas, rye, sweet potatoes, corn, cotton seed, pea-nuts, etc., were utilized.

The medical history of chiccory is of little value to us. A free use of the root and leaves produces, according to Lewis, a mild catharsis, rendering aid in jaundice and obstruction of the bowels. It has also been used as a diuretic and detergent in gravel, and a refrigerant in hectic fevers and agues.*

PART USED AND PREPARATION.—The fresh root, gathered while the plant is budding to blossom, is to be treated as in preceding drug. The resulting tincture has a clear orange color by transmitted light, an acid bitter taste, and acid reaction.

CHEMICAL CONSTITUENTS.—The activity of the plant, without doubt, lies wholly in its milk-juice, which has not yet been investigated.

PHYSIOLOGICAL ACTION.—We have no record of toxical effects of Cichorium; its disturbance of the system is very slight, and that appears to be wholly confined to a slight increase of glandular secretions.

DESCRIPTION OF PLATE 93.

1. Part of a flowering branch, Binghamton, N. Y.,† Sept. 10th, 1884.
2. A portion of the main stem.
3. Floweret.
4. Akene.
5. Stigma.
6. Section of the root.
7. Pollen grain, x 150.

(3–6 enlarged.)

* Rafinesque, *Med. Bot.*, II, p. 206.

† Where it has escaped to the streets in many localities.

Fm. ad nat. del. et pinxt.

PRENÀNTHES SERPENTÁRIA, Pursh.

Tribe.—CICHORIACEÆ.

GENUS.—**PRENANTHES,*** VAILL.

SEX. SYST.—SYNGENESIA ÆQUALIS.

NABALUS.

RATTLESNAKE ROOT.

SYN.—PRENANTHES SERPENTARIA, PURSH.; P. ALBA, VAR. SERPENTARIA, TORR.; P. GLAUCA, RAF.; NABALUS ALBUS, VAR. SERPENTARIUS, GRAY; NABALUS SERPENTARIUS, HOOK.; N. TRILOBATUS, CASS, AND D. C.; N. FRAZERI, D. C.; N. GLAUCUS, RAF.; HARPALYCE SERPENTARIA, DON.; ESOPON GLAUCUM, RAF.

COM. NAMES.—RATTLESNAKE ROOT, WHITE LETTUCE, LION'S FOOT, GALL-OF-THE-EARTH, DEWITT SNAKEROOT, DROP FLOWER, CANCER WEED; (FR.) LAITUE BLANC, PIED D'LEON; (GER.) WEISSER LATTICH.

A TINCTURE OF THE WHOLE PLANT PRENANTHES SERPENTARIA, PURSH.

Description.—This variable perennial herb, grows to a height of from 1 to 3 feet. *Root* very bitter, fusiform, thickened or more or less tuberous; *stem* stout, upright, glabrous or a little hirsute, sometimes purple-spotted or splashed. *Leaves* alternate, diversely variable, dilated, often decurrent upon the petiole, rather thin and pale beneath; deeply sinuate-pinnatifid, or 3-parted, and the terminal lobe 3-cleft; the margin a little rough-ciliate; the cauline nearly all long, slender, petioled; the upper more or less lanceolate; the lower and radical truncate, cordate, or hastate at the base. *Inflorescence* corymbosely thyrsoid-paniculate; *heads* drooping, mostly glomerate at the summit of ascending or spreading floral-branchlets or peduncles, 8 to 12 flowered; *involucre* cylindrical, green, rarely purplish-tinged; *scales* 5 to 14, in a single row, with a few small bractlets at their base; *receptacle* naked. *Flowers* all perfect, pendulous, purplish, greenish-white or ochroleucous; *corolla* ligulate; *style* long and slender; *stigmas* much exserted. *Akenes* linear-oblong or terete, truncated, and finely serrate; *pappus* sordid, straw-color, or whitish,† composed of rough capillary bristles.

History and Habitat.—This botanically difficult species, assumes, in its mode of growth and shape of leaf, all the forms from *P. alba* to *P. altissima*, including two varieties (*nana* and *barbata*); hardly two plants in any one district being found with constant characters except, mayhap, those of the glomerules and pappus. Thus, now, *P. serpentaria* includes in itself what were once considered

* Πρηνής, *prenes*, drooping; ἄνθη, *anthe*, flower.

† As a shade of color cannot be absolutely kept through several thousand copies in lithography, some of the plates may not represent the pappus correctly.

to be 17 distinct species and varieties; and affords an interminable field of work for a botanist of Rafinesquian tendencies. The Rattlesnake Root is indigenous to North America, where it ranges from New Brunswick and Canada, to Florida, being especially abundant northward. It habits the sterile soil of open grounds and hilly wood-borders, and blossoms in August and September.

As Gall-of-the-Earth, it has been known in domestic practice from an early date, and is said to be an excellent antidote to the bite of the rattlesnake and other poisonous serpents,—one who searches through the domestic literature of medicinal plants, wonders why the bite of snakes ever has a chance to prove fatal.—As an alexiteric, the milky juice of the plant is recommended to be taken internally, while the leaves, steeped in water, are to be frequently applied to the wound; or a decoction of the root is taken. A decoction of the root has been found useful in dysentery, anemic diarrhœa, and as a stomachic tonic.

Prenanthes is officinal in none of the pharmacopœias.

PART USED AND PREPARATION.—The whole plant, gathered during the flowering season, is treated as directed under Lappa.* The resulting tincture has a beautiful deep-orange color by transmitted light; an odor similar to that of the root; a bitter, astringent taste; and an acid reaction.

CHEMICAL CONSTITUENTS.—No analysis of this species has been made to determine a specific principle. An analysis of the root of *P. alba*—too nearly allied to this species—by Neri. B. Williams,† showed the presence of resins, tannin, extractive, gum, and waxy matters.

DESCRIPTION OF PLATE 94.

1. Inflorescence, Binghamton, N. Y., Aug. 25th, 1886.
2. A lower leaf.
3. A portion of leaf-margin.
4. Flower.
5. Involucral scales.

6 and 7. Floret.

(3–7 enlarged.)

* Page 92–2.

† Thesis, *Am. Jour. Phar.*, 1886, 117.

Fm. ad nat. del. et pinxt. TARÁXACUM DENS-LEÒNIS, Desf.

Tribe.—CICHORACEÆ.

GENUS.—**TARAXACUM,*** HALLER.

SEX. SYST.—SYNGENESIA POLYGAMIA ÆQUALIS.

TARAXACUM.

DANDELION.

SYN.—TARAXACUM DENS-LEONIS, DESF.; TARAXACUM OFFICINALIS, WEBER; TARAXACUM VULGARE, SCHR.; LEONTODON† TARAXACUM, LINN.; LEONTODON DENS-LEONIS, LAM.; LEONTODON VULGARE, LAM.; LEONTODON OFFICINALIS, WITH.; DENS-LEONIS, RAII.; HEDYPNOIS TARAXACUM, SCOP.

COM. NAMES.—DANDELION,‡ PUFF-BALL;ʔ (ENG.) PISSABED; (FR.) DENT DE LION, PISSENLIT COMMUNE; (GER.) LÖWENZAHN, PFAFFENROHRLEIN.

A TINCTURE OF THE FRESH ROOT OF TARAXACUM DENS-LEONIS, DESF.

Description.—This vernal, tufted, perennial herb, springs from a vertical tap-shaped *root*, furnished with numerous short, thickened rootlets. *Leaves* radical, varying from spatulate to lanceolate, pinnatifid, runcinate, or irregularly dentate. *Inflorescence* several many-flowered heads, each raised upon a scape that elongates during and after anthesis; *scape* slender, naked, cylindrical, fistulous, 6 to 18 inches long in fruit. *Involucre* double, the outer portion composed of numerous short scales; the inner of a single row of linear, erect scales. *Receptacle* naked. *Akenes* terete, oblong, ribbed; *ribs* roughened by numerous, ascending tubercles; *apex* abruptly conical or pyramidal, prolonged into a slender, filiform beak; *pappus* borne upon the summit of the beak, and composed of copious, soft, white, capillary bristles. Read description of the order, under Eupatorium purpureum, 78.

History and Habitat.—The Dandelion is a native of Greece, or, at least, of Europe and Asia Minor, and has become by introduction a common herb in fields, pastures, lawns and open grounds everywhere in this country, where it blossoms in early spring and fruits in the summer. The growth of this plant furnishes an instance of a beautifully provisional Nature. During the expansion of the flower, the outer scales of the involucre reflex, after anthesis the inner row contracts until it covers the forming pappus; then while the fruit is maturing the beaks gradually extend by growth and raise the pappus, until finally the inner involucre

---

* Ταράσσω, *tarasso*, to disorder, in allusion to its action upon the system.

† Λεον, *leon*, lion; ὀδους, *odous*, a tooth; from a supposed likeness of the leaf incisions to a lion's tooth.

‡ Americanized from (Fr.) Dent de lion.

ʔ On account of the separability of the akenes from the receptacle. The true puff-ball is *Lycoperdon Bovista*.

in turn reflexes, disclosing the fruit as a beautiful, white, globular, feathery head, exposing upon its coronate receptacle the ripe seeds ready to be dissipated and wafted to new fields by the first summer zephyr that passes by.

Tufts of this plant are eagerly gathered by the poor, in early spring, and cooked, furnishing thus an excellent and palatable pot-herb; they are also in many localities bleached like, and used in lieu of, endive,* as a salad. The leaves are eaten raw or cooked by the Digger and Apache Indians, who value them so highly that they scour the country for many days' journeys in search of sufficient to appease their appetites. So great is their love for the plant, that the quantity consumed by a single individual exceeds belief.† In many parts of Europe, especially in Germany, the dried roots "are roasted and substituted for coffee by the poorer inhabitants, who find that an infusion prepared in this way can hardly be distinguished from that of the coffee berry."‡

Taraxacum has been used in medicine from ancient times; it is one of those drugs, overrated, derogated, extirpated, and reinstated time and again by writers upon pharmacology, from Theophrastus' *αφάκη* and *κιχοριον* to the present day. It has been considered as a mild detergent, aperient, and diuretic; Bergius recommends it in hepatic obstruction, hypochondriasis, and icterus; and many authors give it repute in dropsy, pulmonic tuberculosis, various skin disorders, gastric derangements, biliary calculi, incipient visceral scirrhus, etc., etc. Children often play with the scapes at making chains, bracelets and "curls." The curls are formed as follows: A split is started in four directions at the smaller end of a scape, into which the tongue is deftly and gradually inserted, causing a slow separation into sections that curl backward, revolutely, being kept up to their form by the tongue, when the scape is curled to the end it is drawn several times through the operator's mouth and partially uncurled into graceful ringlets. In its manufacture a child usually gets full benefit of the milky, bitter juice, and, if susceptible, verifies the common name of the plant as applied in England: . . . *quasi lectiminga et urinaria herba dicitur—plus lotii derivat in vesicam quàm pueruli retinendo sunt, præsertim inter dormiendum, eòque tunc imprudentes et inviti stragula permingunt.*§

Taraxacum is officinal in the U. S. Ph., its preparations being: *Extractum Taraxaci* and *Extractum Taraxaci Fluidum.* The same preparations are officinal in Eclectic pharmacopœias, also *Decoctum Taraxaci*, and *Pilulæ Taraxaci Compositæ.*||

PART USED AND PREPARATION.—The fresh root, gathered in March, July or November, is chopped and pounded to a pulp and pressed out in a piece of new linen. The expressed juice is then, by brisk agitation, mingled with an equal part by weight of alcohol. This mixture is allowed to stand eight days in a dark, cool place.

The tincture, separated from the above mass by filtration, should have a light orange color by transmitted light, a bitter, somewhat acrid taste, and an acid reaction.

---

* *Cichorium endiva.*

† Dodge, *U. S. Agric. Rep.*, 1870, p. 423.

‡ Murray, *App. Med.*, p. 107.

§ *Raii Hist. Pl.*, p. 244.

|| Sanguinaria, Podophyllin, Taraxacum, and Mentha viridis.

CHEMICAL CONSTITUENTS.—*Taraxacin.* This body, when extracted from the roots or milky juice, forms in a bitter amorphous mass, soluble in alcohol, ether, and water. It was discovered by Polex in 1839, and named by Kromayer, who corroborated the discovery in 1861.

Taraxacerin, $C_8 H_{16} O$.—(Kromayer, 1861). This crystalline principle is said to resemble *lactucerin.** It is soluble in alcohol, but not in water.

Levulin, $C_6 H_{10} O_5$.—(Dragendorf). This amylose principle has the same composition as *inulin,*† but differs in that it is soluble in water and devoid of rotary power.

Inosite, $C_6 H_{12} O_6 (H_2 O)_2$.—(Marmé, 1864). This hydride of glucose was determined in the leaves and scapes, but not in the root. It forms transparent rhombic crystals, losing their water of crystallization when exposed to the air. It is soluble in water, the solution having a sweet taste.

Leontodonium‡ is simply, or in great part, the inspissated juice of the plant, and in a measure the principles *en masse.* *Mannite,* $C_6 H_8 (O H)_6$, has been proven by Messrs. T. and H. Smith (1849) to be present only after a sort of fermentation had taken place in the juice.§ This is probably the change that takes place to a greater or less extent, when the roots are undergoing the winter changes.

Taraxacum also contains, according to many assayists,‖ caoutchouc, resin, gum, mucilage, free acid, sugar, wax, and the usual plant constituents.

PHYSIOLOGICAL ACTION.—Although this plant has received the attention of scientists of all nations from remote times, still I know of no attempt having been made to determine its toxic action.

The symptoms caused by repeated doses are, in general: mental excitement, vertigo and headache, blotchy white coated tongue, nausea and colic; frequent urination; general sticking or stitching pains; sleepiness, chilliness and sweating. These symptoms point to a peculiar action upon the liver, causing inaction of that organ. Its action upon the skin in causing an exanthem seems to be dependent greatly upon the amount of gastric irritation.

DESCRIPTION OF PLATE 95.

1. Whole plant, Bergen, N. J., May 14th, 1879.
2. Root.
3. Ray floret (enlarged).
4. Disk floret (enlarged).
5. Fruit.
6. Seed (enlarged).
7. Section of root (enlarged).

---

* See Lactuca, 96.

† See Inula, 81.

‡ Kromayer, 1861.

§ *Et supra,* Flück. & Han., *Pharmacographia,* in part.

‖ Sprengel, Frickhinger, Squire, Polex, John, Overbrook, T. and H. Smith, Dragendorf, Kromayer, Marmé, and Widemann.

F.m. ad nat del. et pinxt.

LACTÙCA CANADÉNSIS, Linn.

Tribe.—CICHORIACEÆ.

GENUS.—**LACTUCA**,* TOURN.

SEX. SYST.—SYNGENESIA ÆQUALIS.

LACTUCA.

LETTUCE.

SYN.—LACTUCA CANADENSIS, LINN.; L. ELONGATA, MUHL. (TYPE); L. ELONGATA, VAR. LONGIFOLIA. T. & G.; L. CAROLINIANA, WALT.; L. LONGIFOLIA, MICHX.; GALATHENIUM ELONGATUM, NUTT.; SONCHUS PALLIDUS, WILLD.

COM. NAMES.—WILD LETTUCE, FIRE-WEED,† TRUMPET-WEED,‡; (FR.) LAITUE DU CANADA; (GER.) CANADISCHE LATTICH.

A TINCTURE OF THE WHOLE PLANT, OF VARIOUS SPECIES, INCLUDING THIS.

Description.—This glabrous, glaucescent biennial, grows to a height of from 4 to 9 feet. *Stem* erect, very leafy to the top, and copiously supplied with milky juice. *Leaves* alternate, mostly sinuate, pinnatifid below, lanceolate and entire above, all partly clasping by a sagittate base, and pale beneath; *midrib* naked, or rarely with a few sparse bristles; *margins* entire or sparingly dentate, especially near the base; *terminal lobe* elongated. *Inflorescence* in a terminal, narrow, elongated, leafless panicle; *heads* 12- to 20-flowered; *flowers* pale yellow, all perfect: *involucre* a half-inch or less high, cylindraceous, irregularly calyculate, and slightly imbricated in two rows. *Corolla* ligulate in all the flowers of the head; *tube* hairy; *ligules* obscurely, if at all, notched at the apex. *Receptacle* naked. *Akenes* blackish, broadly oval, flat, wingless, rather longer than the beak, obscurely scabrous-rugulose, and lightly 1-nerved in the middle of each face; *beak* filiform, abrupt at the base, and expanded at the apex; *pappus* of soft, silvery-white hairs, on the dilated apex of the beak.

History and Habitat.—Wild Lettuce is indigenous to North America, where it extends from Nova Scotia and Canada to Saskatchewan, and southward to Upper Georgia. It habits rich moist grounds along the borders of fields, thickets, and roads, where it blossoms in July and August.

This species has been used in early practice as an anodyne, diaphoretic, laxative, and diuretic, in many diseases, principally, however, in hypochondria, satyriasis, nymphomania, phthisis pulmonalis, ascites, anasarca, and nervous complaints in general.

---

* Latin, *lac*, milk; on account of the milky juice.

† Many plants have been given this name in different localities, on account of their growing particularly on newly-burned fallows, *Enechthites hieracifolius*, *Senecio aureus*, *Hieracium Canadense*, and this.

‡ This name also designates *Eupatorium purpureum*.

Lactucarium, or Lettuce Opium, being of the same nature, no matter from what species it is obtained, consists of the inspissated milky juice of various species of Lactuca. The yield varies greatly with the species; greatest in *L. virosa*, and diminishing as follows: *L. scariola*, *L. altissima*, *L. Canadensis*, *L. sativa*. Dr. Coxe, of Philadelphia, was the first to call the attention of the profession to this substance as a substitute for commercial opium;* his reasoning and experiments were based upon the product of *L. sativa*. Although Lettuce has been considered narcotic from ancient times, still it is but slightly soporific, and hardly deserves a tithe of the reputation writers have made for it.

Lactucarium from *L. virosa* is still officinal in the U. S. Phar., but will, without doubt, be dropped at the next revision.

PART USED AND PREPARATION.—The whole fresh plant, just as the blossoms open, is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. After stirring the whole well, it is poured into a well-stoppered bottle, and allowed to stand eight days in a dark, cool place. The tincture formed thus, after straining and filtering, has a deep orange-red color by transmitted light; the odor of canned tomatoes; a slightly bitter and astringent taste; and an acid reaction.

CHEMICAL CONSTITUENTS.—*Lactucarium*, or *Thridace*, as noted above, represents in itself all the active principles of the plant, being a mixture of different organic and about ten per cent. inorganic bodies. It is not fully soluble in any vehicle, and merely softens on the application of heat. Subjected to analysis, it yields:

Lactucerin,† $C_{19}H_{30}O$.‡—This compound body composes nearly half the whole weight of Lactucarium. It forms in slender, colorless, microscopic, odorless and tasteless acicular crystals, insoluble in water, soluble in boiling alcohol and cold ether, and melting at 232° (449.6° F.).

Lactucin, $C_{11}H_{12}O_3(H_2O)$.—This body, which proves not to be a glucoside, gives to Lactucarium its intensely bitter taste. It forms, when purified, white, bitter, pearly scales, insoluble in ether, soluble in alcohol and in hot water.

Lactucic Acid.—This very acid body, isolated by Pfaf and Ludwig, results as an amorphous light yellow or brownish mass, only crystallizing after long standing.

Lactucopicrin, $C_{44}H_{64}O_{21}$.—This bitter amorphous substance seems to be formed by the oxidation of *Lactucin*. It is soluble in alcohol and water.

Beside the above, Lactucarium also contains a yellowish-red tasteless resin; a greenish-red acrid resin; caoutchouc; gum; oxalic, citric, malic, and succinic acids; sugar; mannite; asparagin; and a volatile oil.

---

* *Trans. Am. Philosoph. Socy.*, 1799, 387.

† Lactucon.

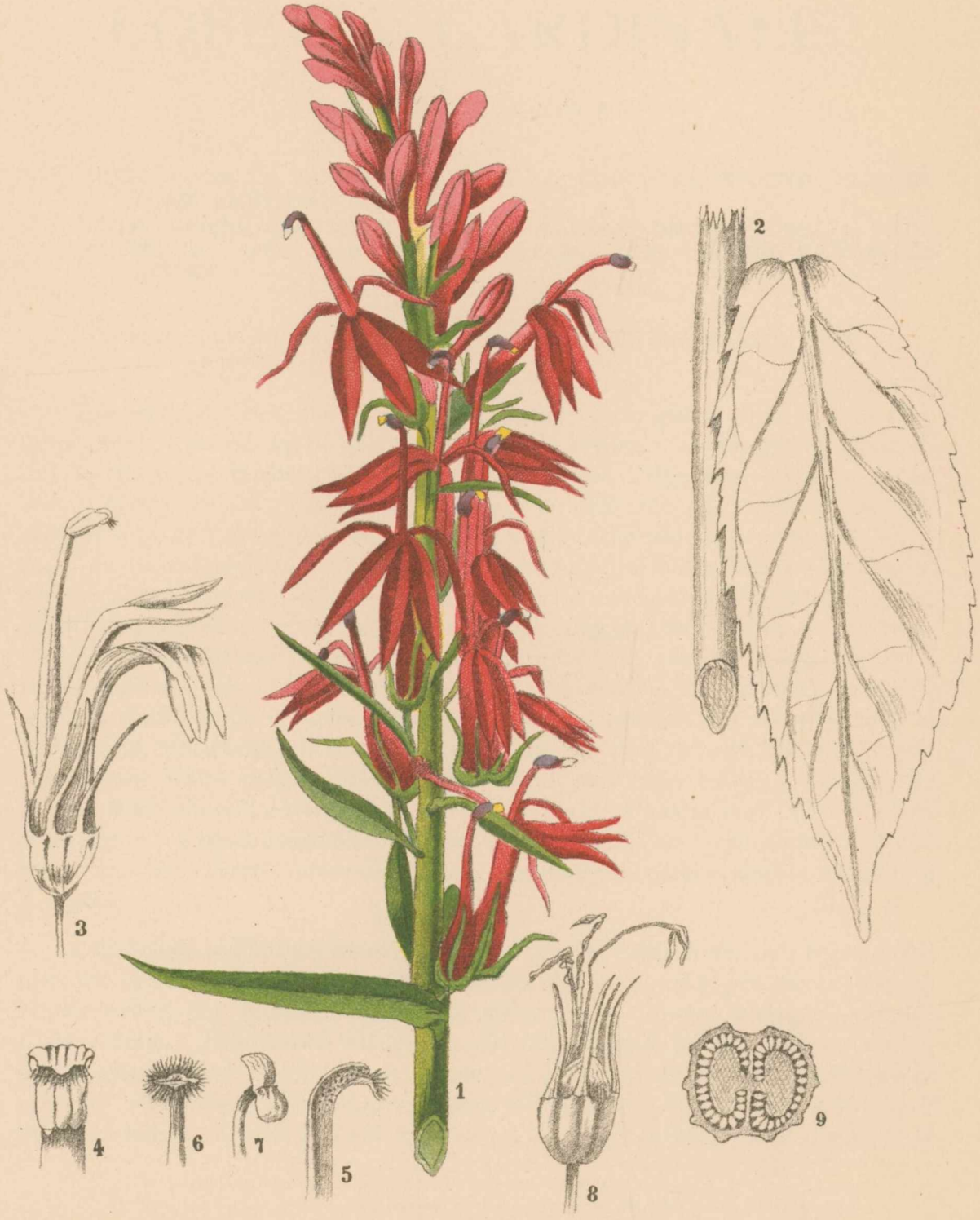
‡ Flückiger, $C_{14}H_{24}O$; Franchimont, $C_{16}H_{26}O$.

PHYSIOLOGICAL ACTION.—Lactucarium, in large doses, causes: Delirium; confusion of the brain, vertigo, and headache; dimness of vision; salivation; difficult deglutition; nausea and vomiting, and retraction of the epigastric region, with a sensation of tightness; distension of the abdomen, with flatulence; urging to stool followed by diarrhœa; increased secretion of urine; spasmodic cough, oppressed respiration, and tightness of the chest; reduction of the pulse ten to twelve or more beats; unsteady gait; great sleepiness; and chills and heat, followed by profuse perspiration.

DESCRIPTION OF PLATE 96.

1. Whole plant, eighteen times reduced, Binghamton, N. Y., July 26th, 1885.
2. A portion of the panicle.
3. An upper leaf.
4. Outline of a lower leaf.
5. Flower-head.
6. A floret.
7. Anther.
8. Fruit.

(6 and 7 enlarged.)



Fm. ad nat. del. et pinxt.

LOBÈLIA CARDINÀLIS, Linn.

Tribe.—LOBELIEÆ.

GENUS.—**LOBELIA,*** LINN.

SEX. SYST.—PENTANDRIA MONOGYNIA.

LOBELIA CARDINALIS.

CARDINAL FLOWER.

SYN.—LOBELIA CARDINALIS, LINN.; L. COCCINEA, STOKES; TRACHELIUM AMERICANUM, PARK.

COM. NAMES.—CARDINAL FLOWER, SCARLET OR RED LOBELIA, HIGH-BELIA; (FR.) LOBELIE CARDINALE; (GER.) ROTHE KARDINALS BLUME.

A TINCTURE OF THE WHOLE PLANT LOBELIA CARDINALIS, LINN.

Description.—This showy perennial grows to a height of from 2 to 4 feet. *Stem* minutely pubescent or glabrous, commonly simple. *Leaves* oblong-ovate, to oblong-lanceolate, tapering at both ends, sessile, and irregularly serrate or serrulate. *Inflorescence* a dense, terminal, more or less one-sided virgate raceme; *flowers* large and showy, intense red, or rose-color, sometimes pure white; *pedicels* erect or ascending; *bracts* of the upper portion linear-lanceolate, of the lower, leafy. *Calyx* smooth; *tube* short, hemispherical, much shorter than the lobes; *lobes* linear-subulate. *Corolla*† gamopetalous, tubular; *tube* about 1 inch long, straight; *limb* bilabiate; *upper lip* 2-parted to the base, the cleft extending down to the calyx, the lobes erect, linear-lanceolate; *lower lip* 3-cleft, spreading plane or slightly recurved, the segments oblong-lanceolate. *Stamens* free from the tube of the corolla, monadelphous almost to the base, exserted through the cleft in the corolla tube, which they again enter between the two upper lobes; *filaments* red; *anthers* syngenesious, curved, blue, the two larger ones naked at the tip, the other three ciliate. *Capsule* hemispherical, thin-walled, 2-celled, and loculicidally 2-valved at the summit. *Seeds* numerous, oblong, rugulose-tuberculate, similar to those of *L. inflata*.

Lobeliaceæ.—This large family, closely related to *Campanulaceæ*, is represented in North America, by 7 genera and 31 species, characterized in general as follows: Herbs (when not Tropical) with acrid, milky juice. *Leaves* alternate, simple; *stipules* none. *Inflorescence* racemose; *flowers* 5-merous, perfect. *Calyx* adnate to the ovary; *limb* divided down to the ovary, or entire; *lobes* persistent when present. *Corolla* regular and perigynous, inserted with the stamens just where the calyx leaves the ovary; *limb* disposed to become bilabiate; *lobes* 5, valvate in

* Dedicated to Mathias de L'Obel, a Flemish herbalist, Botanist to James I.

† In describing this organ, I adopt the position it stands in while flowering. See *Lobeliaceæ*.

the bud, or in some cases induplicate, commonly deeper cleft or completely split down between two of the lobes (this cleft is generally upon the lower face of the corolla when the bud is young, but becomes superior, by a twisting of the pedicel, during its maturation). *Stamens* 5, epigynous, as many as the lobes of the corolla and alternate with them, usually both monadelphous and syngenesious; *filaments* generally free from the corolla, but not invariably so; *anthers* 2-celled, introrsely dehiscent, firmly united around the top of the style. *Ovary* wholly inferior, or sometimes half free, 2-celled, with the placentæ projecting from the axis (sometimes 1-celled with 2 parietal placentæ); *ovules* anatropous; *style* filiform, entire; *stigma* commonly 2-lobed, and girt with a ring of more or less rigid hairs, at first included, then exserted.* *Fruit* capsular and loculicidal, or baccate and indehiscent; seeds indefinitely numerous; *embryo* small or narrow, straight and axial; *albumen* copious, fleshy.

Many species of this order are acrid, narcotic poisons, only a few being, so far, used in medicine, among which the West Indian *Rebenta Cavallos* (*Hippobroma longifolia*, Don.) is noted for its poisonous properties. If taken internally it speedily brings on hypercatharsis, while the juice, if touching the mucous membrane, quickly causes acute inflammation; and *Tupa Fenillaei*, Don., is said to bring on nausea in one simply smelling of its flowers. The three species described in this work are, however, all that are much used.

History and Habitat.—The Cardinal Flower is indigenous to North America, from New Brunswick to Saskatchewan, southward east of the Mississippi to Florida, and southwest to the borders of Texas. It rears its magnificent spike of gorgeous flowers along the muddy banks of streams, during the early autumn months. It was introduced into Great Britain from Virginia, on account of its beauty, in 1629.

Shœpf mentions the use of the root of this species, by the Cherokee Indians, for syphilis; and Dr. Barton speaks of their successful use of it as an anthelmintic By some early physicians it was considered fully equal to Spigelia Marilandica, in this direction. This species is, however, seldom used now, *L. inflata* taking its place entirely. It is considered, however, to possess marked anthelmintic, nervine, and antispasmodic properties.

PART USED AND PREPARATION.—The whole fresh plant, gathered when coming into blossom, is treated as in the next species. The resulting tincture has a clear yellowish-brown color by transmitted light; a sweetish, herbaceous odor and taste; and an acid reaction.

CHEMICAL CONSTITUENTS.—No special examination of this plant having been made, we can do no better at present than to refer to the chemistry of *L. inflata*, page 99–3.

---

* See pp. 98–98-2.

DESCRIPTION OF PLATE 97.

1. Top of a flowering plant, Binghamton, N. Y., Aug. 10th, 1886.
2. A middle leaf.
3. Flower.
4. Stamens.
5. Section of the stamen-tube.
6. Stigma.
7. Open stigma.
8. Fruit.
9. Section of the ovary.

(4–9 enlarged.)

2

3

4

5

1

Fm. ad nat. del. et pinxt.

LOBÈLIA SYPHÍLITICA, Linn.

GENUS.—**LOBELIA**, LINN.

SEX. SYST.—PENTANDRIA MONOGYNIA.

LOBELIA SYPHILITICA.*

GREAT BLUE LOBELIA.

SYN.—LOBELIA SYPHILITICA, LINN.; LOBELIA CŒRULEA? LOBELIA GLANDULOSA, LINDL.; LOBELIA REFLEXA, STOKES.

COM. NAMES.—GREAT LOBELIA, BLUE LOBELIA, BLUE CARDINAL FLOWER; (FR.) LOBELIE SYPHILITIQUE; (GR.) GEMEINE LOBELIE.

A TINCTURE OF THE WHOLE FRESH PLANT, LOBELIA SYPHILITICA, LINN.

Description.—This erect, perennial herb attains a growth of from 1 to 3 feet, its conspicuous racemes being generally from one-third to one-quarter the length of the whole plant. *Stem* simple, leafy to the base of the raceme, and somewhat hairy, especially upon its angles. *Leaves* sessile, ovate-lanceolate, irregularly denticulate-serrate, acute at the base, from 2 to 6 inches long, and about 1 inch wide; thin, and more or less appressed hairy. *Inflorescence* supra-axillary, composed of a long, at first leafy, then morphologically bracted, dense spike or raceme; *pedicels* shorter than the bracts; *flowers* light blue, nearly 1 inch long, extending beyond the leafy bracts. *Calyx* five-cleft, hirsute, shorter than the tube of the corolla, with reflexed, conspicuous, two-cleft auricles at the sinuses; *tube* hemispherical, short; *lobes* one-half the length of the corolla. *Corolla* with a straight, sub-cylindrical tube, more or less two-lipped, having a deep fissure at the superior margin; *upper lip* of two erect, slightly diverging lobes; *lower lip* spreading and three-lobed by incision. *Fruit* a globose pod, free above, but enclosed by the loose, persistent calyx; two-celled, opening at the apex; *seeds* many. For a description of the Natural Order, see Lobelia cardinalis, 97.

History and Habitat.—The great blue lobelia habits the borders of marshy places and wet spots in pasture lands and meadows, pretty generally throughout the United States, to which it is indigenous; flowering from July to September. In some localities it is called *high belia*, in unconscious pun upon its lowlier but more frequently-used companion, L. inflata, or *low belia*, as they term it. The lobelias furnish one of the best examples of the system of cross-fertilization in plants. The stamens, especially their anthers, grow into a tube, enclosing the stigma, and apparently making self-fertilization positive. A closer study, however, reveals the following conclusive points: The stigma is two-lobed, the recep-

* Dr. Hale, in his "New Remedies," treats of this drug as Lobelia cœrulea. Dr. Allen remarks that—as there are a number of blue lobelias, and beside this the true *cærulea* grows at the Cape of Good Hope, and may yet be proven—*syphilitica* should always designate this drug.

tion surfaces—in the earlier stages of growth and while enclosed in the anther tube—are tightly pressed together and fringed with close, bristly hairs, all together resembling the mouth of a full-bearded man, with lips compressed. The tube of anthers opens by a pore at the tip and discharges the ripened pollen directly through this pore when it is irritated by the back of any insect that may creep into the throat of the corolla after nectar. As the pollen is discharged, the stigma, by elongation of the style, presses forward, keeping up the discharge by acting as a swab, until the cell is completely empty; then, as it projects beyond the pore, the compressed lips open and roll back, standing ready to collect the pollen from the back of some insect that has been on a visit to a neighboring plant.

The former uses of this plant were the same as those of L. inflata, than which it is less active. The natives of North America are said to have held this plant a secret in the cure of syphilis, until it was purchased from them by Sir William Johnson, who took a quantity to Europe, and introduced it as a drug of great repute in that disease. European physicians, however, failed to cure with it, and finally cast it aside, though Linnæus, thinking it justified its Indian reputation, gave the species its distinctive name, *syphilitica*. The cause of failure may be the fact that the aborigines did not trust to the plant alone, but always used it in combination with may-apple roots (*Podophyllum peltatum*), the bark of the wild cherry (*Prunus Virginica*), and dusted the ulcers with the powdered bark of New Jersey tea (*Cenothus Americanus*). Another chance of failure lay in the volatility of its active principle, as the dried herb was used. It is not officinal in the U. S. Ph., nor in the Eclectic Materia Medica.

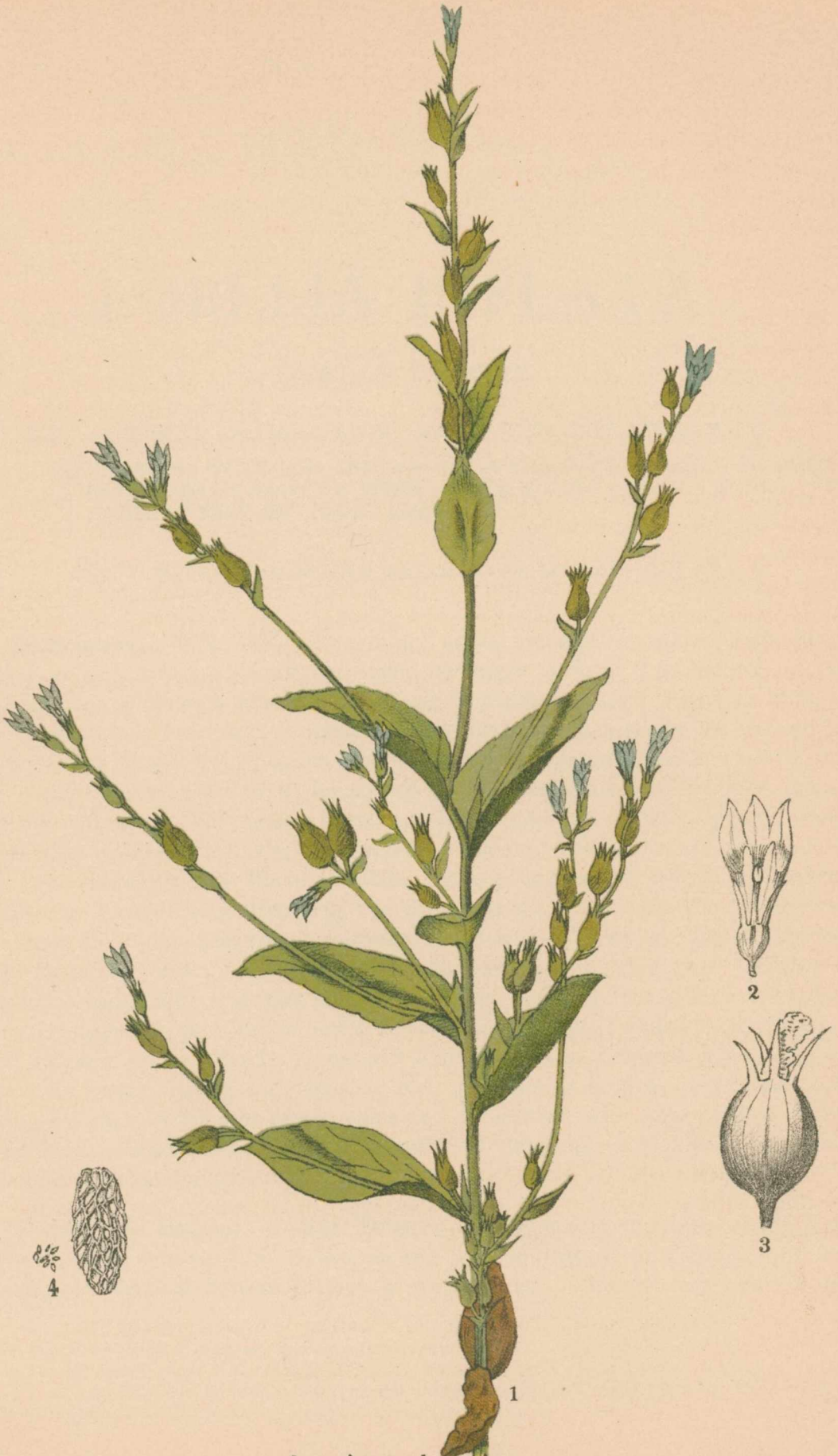
PART USED AND PREPARATION.—The whole fresh plant is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it and the rest of the alcohol added. The whole, after thorough mixture, is poured into a well-stoppered bottle and allowed to stand eight days in a dark, cool place. The tincture is then separated by straining and filtering. Thus prepared, it has a beautiful, clear, light-brown color by transmitted light, a slightly bitter taste and tingling sensation upon the tongue, and a strong acid reaction.

CHEMICAL CONSTITUENTS.—The chemical properties of this plant will probably be found to differ from those of L. inflata only in quantity. An analysis by M. Boissel resulted in the separation of fatty and butyraceous matters, mucilage, sugar, earthy salts, and a volatile bitter principle.

PHYSIOLOGICAL ACTION.—No data upon this is obtainable. We will do well, perhaps, to again consult L. inflata, which, in virulence of action, is the type of the genus in the Northern States.

DESCRIPTION OF PLATE 98.

1. Whole plant, once reduced; from Chemung, N. Y., September 9, 1879.
2. Apex of receme.
3. Flower (somewhat enlarged).
4. Fruit.
5. Pollen, with end view x 380.



F.M. ad nat del. et pinxt.

LOBÈLIA INFLATA, Linn.

Tribe.—LOBELIEÆ.

GENUS.—**LOBELIA**, LINN.

SEX. SYST.—PENTANDRIA MONOGYNIA.

LOBELIA INFLATA.

INDIAN TOBACCO.

SYN.—LOBELIA INFLATA, LINN.; RAPUNTIUM INFLATUM, MILL.

COM. NAMES.—WILD OR INDIAN TOBACCO, EYE-BRIGHT,* BLADDER POD,† EMETIC ROOT OR WEED, PUKE WEED, ASTHMA WEED; (FR.) LOBÉLIE ENFLÉE; (GER.) LOBELIE.

A TINCTURE OF THE WHOLE FRESH HERB LOBELIA INFLATA, L.

Description.—This well-known milky, acrid, biennial or annual herb, varies greatly in its growth, generally, however, its height is from 8 inches to 2 feet.‡ *Root* slender, yellowish-white; *stem* erect, somewhat angled, lined or winged, leafy, paniculately branched, especially above, and divergently hirsute, principally below; *leaves* sessile, veiny, acute, and irregularly or obtusely toothed; they vary from ovate or oblong below to foliaceous or even subulate bracts above, longer than the pedicels. *Inflorescence* loose, terminal, spike-like racemes; *flowers* small, inconspicuous, irregular. *Calyx* persistent 10-veined, not auriculate nor appendaged in the sinuses; *lobes* linear-subulate, nearly as long as the corolla, and springing from a decided ring involving the throat of the tube. *Corolla* marcescent, about two lines long, pale blue externally, somewhat violet within; *lobes* 5, the two upper lanceolate, erect, the three lower ovate, acute, and projecting. *Stamens* 5, epigynous, projecting with the style (which they enclose) through the complete slit in the upper median line of the corolla tube. *Capsule* 2-celled, oval, glabrous, much inflated, longitudinally 10-nerved and roughened between the nerves by transverse rugæ, they greatly exceed their pedicels in length; *seeds* numerous, oblong, rough, of a brilliant brown color and reticulated with honey-yellow intermixed lines; *placentæ* central. A description of the genus is incorporated in that of Lobelia Cardinalis, 97.

History and Habitat.—Indian Tobacco is common in dry open fields from Hudson's Bay westward to Saskatchewan and southward to Georgia and the Mississippi, where it flowers from July to October. Linnæus first noticed this

---

* The true eye-bright is *Euphrasia officinalis, L.* (*Scrophulariaceæ*).

† The true bladder-pod is *Vesicaria Shortii, T. & G.* (*Cruciferæ*).

‡ I met many individuals this season (1885), scarcely 3 inches high, simple stemmed, and in full flower and fruit. I judge this depauperate form to be the *var. simplex* of Rafinesque.

species in the Transactions of the Upsal Academy in 1741.[1] It was introduced into England in 1859, and noticed medically by Schoepf in 1787, his observations being mostly founded upon the use of the plant by the American aborigines as an emetic, and application for "sore eyes." It afterward became in frequent use by Botanic physicians, and in 1813 was more or less prominently brought before the medical profession by the Rev. D. Cutler, as a valuable remedy in asthma. Its use was not carried into England until 1829.

The name Indian Tobacco might have arisen either from the peculiar tobacco-like sensation imparted to the tongue and stomach on chewing the leaves, or from the fact that the American Indians often smoked the dried leaves to produce the effect of the drug.

Lobelia has been recommended and used in the Botanic practice particularly, either alone or compounded with other drugs, for almost every disease known, and has proven curative in some cases, palliative in more, useless in many, and a deadly poison in more cases than one. Its action, as will be seen farther on, is, as in all narcotics, principally upon the brain, thus making it anything but a desirable emetic, as which it is most frequently used. From the power it exhibits to relax the whole system, it has been found very valuable in spasms, tetanus, croup, strangulated hernia, whooping cough, and even hydrophobia. Samuel Thomson claims to have discovered the virtues of the plant, though without doubt his first ideas of its emetic property were gathered from the Indians. He went so far as to claim it curative in all disorders, giving it with such a reckless hand that he fatally poisoned one of his patients, a certain Ezra Lovett, for which he was arrested on the charge of murder, escaping punishment because said Lovett was foolish enough to take the prescription of a man who claimed to carry such potent (?) drugs as "*well-my-gristle*" and "*ram-cats.*"

Lobelia Inflata is officinal in the U. S. Ph., as: *Acetum Lobeliæ; Extractum Lobeliæ Fluidum;* and *Tinctura Lobeliæ;* and in the Eclectic Materia Medica as above, and as: *Cataplasma Lobeliæ et Ulmus;*[2] *Enema Lobeliæ Composita;*[3] *Extractum Lobeliæ Fluidum Compositum;*[4] *Linimentum Stillingiæ Compositum;*[5] *Lotio Lobeliæ Composita;*[6] *Oleum Lobeliæ; Pilulæ Aloes Compositæ;*[7] *Pulvis Lobeliæ Compositus;*[8] *Tinctura Hydrastis Compositæ;*[9] *Tinctura Lobeliæ Composita;*[10] *Tinctura Lobeliæ et Capsici;*[11] *Tinctura Sanguinariæ Acetata Composita;*[12] *Tinctura Sanguinariæ Composita,* and *Tinctura Viburni Composita.*[13]

PART USED AND PREPARATION.—The whole plant gathered in September, or when the last flowers are developing and the lower capsules are ripe,

---

[1] *Trans. Upsal,* 1741, t. 1, p. 43.

[2] Lobelia, Elm, and Lye.

[3] Tinctura Lobeliæ et Capsici ʒss, water ℥ss.

[4] Lobelia, Skunk-cabbage, and Sanguinaria.

[5] Oils of Stillingia, Cajeput, and Lobelia.

[6] Bayberry bark, Lobelia leaves and seeds, and Yellow Dockroot.

[7] Boneset, Mandrake, Ginseng, Aloes, Soap, Gamboge, and Capsicum and Lobelia seeds.

[8] Lobelia, Blood-root, Skunk-cabbage, Ipecac, and Capsicum.

[9] Hydrastis and Lobelia.

[10] Lobelia, Wild Ginger (*Asarum Canadense* ?), Blood-root, Skunk-cabbage, and Pleurisy-root.

[11] Lobelia, Capsicum, and Skunk-cabbage root.

[12] Blood-root, Lobelia, Skunk-cabbage root, and Vinegar.

[13] High Cranberry bark, Lobelia seed, Blood-root, Skunk-cabbage seed, Capsicum, and Stramonium seed.

should be treated as in the preceding species. The resulting tincture should be of a clear reddish-orange color by transmitted light, and have a very acrid penetrating tobacco-like taste, a peculiar characteristic odor, and an acid reaction.

CHEMICAL CONSTITUENTS.—*Lobelina.*[1] This alkaloidal body was discovered by Calhoun,[2] though Procter was first to isolate it.[3] Bastic,[4] working without a previous knowledge of its discovery, also isolated the principle. Lobelina exists after separation, especially when carefully sealed, as an oily, yellowish fluid having a decided alkaline reaction, this is especially noticeable in its watery solution. Its taste is acro-pungent, very like that of nicotia. It exhibits, even in very small doses, the poisonous action of the herb. It is somewhat volatile, decomposing and losing its acridity at a temperature above 100° (212° F.) either alone or in the presence of dilute acids or caustic alkalies. It is soluble in water, alcohol, and ether. Lobelina neutralizes acids, and except with acetic, forms crystallizable salts, more soluble in water than the alkaloid itself.

Lobelacrin.—This glucoside (?) was discovered by Pereira [5] and corroborated by Enders.[6] Lewes (1878), who made a thorough analysis of this drug, suggests that this body may be *Lobeliate of Lobelina*, a salt of lobelina formed by the free acid in the plant itself. Lobelacrin, according to Enders, exists as acrid, brownish, verrucose tufts, decomposing rapidly in water at 100° (212° F.), and resolving under the action of acids or alkalies into sugar and

Lobelic Acid.—This acid is crystallizable, non-volatile, soluble in water, alcohol, and ether, and yields an insoluble plumbic and soluble baric salt.

Lobelianin.—This body, so named by its discoverer, Pereira, is now considered to be the volatile oil, *Lobeliin*, a compound body isolated by Reinsch, and now considered indefinite.

Oil of Lobelia.—This oil may be extracted from the seeds, which, when bruised between heated rollers, generally yield about 30 per cent. According to Procter its specific gravity is 0.940, and its drying quality and consistence quite similar to that of linseed oil. Dr. John King states [7] that the oil possesses all the medicinal qualities of the seed.

Beside the foregoing, caoutchouc,[8 9 10] extractive,[8 10] resin,[9 10 11] and fat,[9] have been determined.

PHYSIOLOGICAL ACTION.—Thanks to much reckless prescribing by many so-called Botanic physicians, and to murderous intent; as well as to experimentation and careful provings, the action of this drug is pretty thoroughly known. Lobelia

---

[1] *Lobelin, Lobeline.*
[2] *Journ. Phil. Coll. Pharm.*, 300.
[3] *Am. Jour. Phar.*, 1838, p. 98; and farther *ibid.*, 1871, p. 1; and 1851, p. 456.
[4] 1850. *Ibid.*, 1851, p. 270.
[5] *Mat. Med.*, Vol. 2, part 2, p. 12.
[6] 1871, in an analysis made for the authors of the *Pharmacographia*, l. c., p. 400.
[7] *Am. Disp.*, 1880, p. 492.
[8] Bigelow, *Am. Med. Bot.*, 1817, Vol. 1, p. 179.
[9] Reinsch.
[10] Pereira, *l. c.*
[11] Procter, *l. c.*

in large doses is a decided narcotic poison, producing effects on animals generally, bearing great similitude to somewhat smaller doses of tobacco; and *lobelina* in like manner to *nicotia*. Its principal sphere of action seems to be upon the pneumogastric nerve, and it is to the organs supplied by this nerve that its toxic symptoms are mainly due, and its "physiological" cures of pertussis, spasmodic asthma, croup and gastralgia gained. Its second action in importance is that of causing general muscular relaxation, and under this it records its cures of strangulated hernia (by enemata), tetanic spasms, convulsions, hysteria, and, mayhap, hydrophobia. Its third action is upon mucous surfaces and secretory glands, increasing their secretions.

The prominent symptoms of its action are: great dejection, exhaustion, and mental depression, even to insensibility and loss of consciousness; nausea and vertigo; contraction of the pupil; profuse clammy salivation; dryness and prickling in the throat; pressure in the œsophagus with a sensation of vermicular motion, most strongly, however, in the larynx and epigastrium; sensation as of a lump in the throat; incessant and violent nausea, with pain, heat, and oppression of the respiratory tract; vomiting, followed by great prostration; violent and painful cardiac constriction; griping and drawing abdominal pains; increased urine, easily decomposing and depositing much uric acid; violent racking paroxysmal cough with ropy expectoration; small, irregular, slow pulse; general weakness and oppression, more marked in the thorax; violent spasmodic pains, with paralytic feeling, especially in the left arm; weariness of the limbs, with cramps in the gastrocnemii; and sensation of chill and fever. Death is usually preceded by insensibility and convulsions.

Post-mortem.—The stomach is found congested and filled with fluid, and the brain engorged with blood.

Description of Plate 99.

1. Whole plant, Chemung, N. Y., September 9th, 1879.
2. Flower.
3. Fruit.
4. Seed natural size and magnified 100 diam.

(2-3 enlarged.)

F.m. ad nat del. et pinxt. ARCTOSTÁPHYLOS UVA-URSI, Spreng.

Tribe.—ERICINEÆ.

GENUS.—**ARCTOSTAPHYLOS,*** ADANS.

SEX. SYST.—DECANDRIA MONOGYNIA.

UVA-URSI.

BEARBERRY.

SYN.—ARCTOSTAPHYLOS UVA-URSI, SPRENG.; A. OFFICINALIS, WILLD.; ARBUTUS UVA-URSI, LINN.; DAPHNIDOSTAPHYLIS FENDLERIANA, KLOT.

COM. NAMES.—BEARBERRY, MOUNTAIN BOX, RED BERRY, UPLAND CRANBERRY, BEAR'S GRAPE, RED-BERRIED TRAILING ARBUTUS, WHORTLEBERRY,† HETH, UNIVERSE; (FR.) BUSSEROLLE, RAISIN D'OURS; (GER.) BÄRENTRAUBE.

A TINCTURE OF THE LEAVES OF ARCTOSTAPHYLOS UVA-URSI.

Description.—This peculiar boreal shrub is seldom erect except that it throws its young shoots upward for from 3 to 8 inches. *Stems* numerous, depressed or trailing; *branches* various, the sterile from 2 to 3 feet long and compactly leafy, the fertile shorter; *bark* mahogany color, scaling off in irregular patches; *roots* thick, ligneous, and creeping. *Leaves* alternate, coriaceous, thick, shining, and evergreen, turning mahogany color when aged, those of the erect branchlets more or less vertical, all oblong spatulate, entire, retuse, and tapering to a short-petioled base. *Inflorescence* in few-flowered, terminal clusters or racemes; *bracts* and *bracteoles* persistent, finally becoming rigid; *flowers* pale, rose-colored, drooping. *Calyx* reddish, persistent, free from the ovary; *lobes* 5, roundish. *Corolla* urceolate, pellucid at the base, deciduous; *tube* inflated, hairy inside, hypogynous; *lobes* 5, short acute, recurved. *Stamens* 10, included; *anthers* large, upright, introrse, the cells opening by terminal pores and appendaged upon the dorsal surface by 2 reflexed awns. *Ovary* 4 to 10 celled; *ovules* solitary in each cell. *Fruit* a glabrous, depressed-globose berry or drupe, about the size of a pea; *pulp* mealy and insipid; *nutlets* 5, when the fruit is baccate, or united firmly into a 5-several celled stone when drupaceous; whether distinct or coherent, the nutlets are bony and 1-nerved upon the dorsal surface.

Ericaceæ.—This chiefly boreal family is represented in North America by 34 genera, 135 species, and 32 recognized varieties, thus producing half the ericaceous genera of the globe, but only one-eighth of the total number of species. The order is characterized as follows: The growth comprises trees, shrubs, and

---

* Ἄρκτος, *arktos*, a bear; σταφυλή, *staphyle*, a grape or berry.

† Generally applied to species of *Vaccinium*, especially *V. Vitis Idæa*, Linn.

some perennial herbs, all having alternate, simple, and undivided leaves, and no stipules. *Flowers* symmetrical, 4- to 5-merous, perfect; *calyx* imbricated or valvate in the bud. *Corolla* gamopetalous, or not rarely 4- to 5-petalous, regular or irregular, hypogynous except in *Vaccineæ*, imbricated or convolute in the bud. *Stamens* free from the corolla or nearly so, as many or twice as many as its lobes; *filaments* distinct; *anthers* introrse or becoming introrsely inverted, 2-celled, usually opening by pores or chinks, and generally awned or somehow appendaged; *pollen* usually composed of 4 united grains. *Ovary* 4- to 10-celled; *placentæ* axial, except in *Monotropeæ; ovules* solitary or numerous, anatropous; *style* single; *stigma* entire or merely lobed, except in *Clethra*, where it is 3-cleft. *Fruit* capsular, baccate, or drupaceous; *embryo* small or minute; *albumen* fleshy; *cotyledons* small or undeveloped.

Our only proven species of this order, except the six represented in this work, are: The European, Asiatic, and British-American Labrador Tea (*Ledum Palustre*, Linn.); and the Russian intoxicant and anti-rheumatic Yellow Rosebay (*Rhododendron chrysanthemum*, Linn.).

Other medicinal species are: The American Rosebay (*Rhododendron maximum*, Willd.), an astringent, and by some accounted narcotic and poisonous; the Swiss *R. ferrugineum*, Linn., an antiarthritic; and the Persian *R. ponticum*, Linn., supposed to be one of the plants whose nectar renders the honey of Trebisond poisonous—an influence also said to be contributed to by *Azalea pontica*, Linn., of this order. The North American Alpine Azalea (*Loiseleuria procumbens*, Desv.) is, like all of the order, astringent; and Marsh Tea (*Ledum latifolium*, Ait.), used in dysentery, diarrhœa, tertian ague, and in some places to render beer heady, though it is said to bring on delirium. The fruit of the Strawberry Tree of the Levant (*Arbutus Unedo*, Linn.), when made into wine, is said to be narcotic—a property also ascribed to the wine of Whortleberries (*Vaccinium ulignosum*, Linn.), which is very intoxicating. The leaves of the European and North American *Andromeda polifolia*, Linn., are an acrid and dangerous narcotic, and are said to kill sheep if browsed upon.

Many species of the order furnish our tables with fine refreshing berries, viz.: The Blue Berry (*Gaylussacia frondosa*, T. & G.); the Huckleberry (*G. resinosa*, T. & G.); the Blue Huckleberries (*Vaccinium Pennsylvanicum*, Lam., *vacillans*, Solander, and *corymbosum*, Linn.); and the Cranberries (*Vaccinium macrocarpon*, Ait., and *V. Oxycoccus*, Linn.); the latter are also refrigerant, and a fine palliative dressing for acute erysipelas.

Among the Western Aborigines the Manzañita, the fruit of *Arctostaphylos tomentosa*, Dougl., is extensively eaten in a fresh or dried state. When dried it is husky but sweet, and is often ground and made into sun-baked bread, or, mixed with corn-meal and cactus syrup, fermented and drank; the cranberry and blue huckleberry are also prized; while the smoke-dried fruits of *Vaccinium myrtillus*, and *V. stamineum*, Linn., are largely stored for winter food.

History and Habitat.—The Bearberry is indigenous to North America, where it extends from New Jersey, Pennsylvania, Wisconsin, and Northern California,

northward to the Arctic Circle. In Europe it extends northward from Northwestern Ireland, Yorkshire, and Central Russia; in Asia also northward from Lower Siberia and Kamtschatka, its northerly range includes Iceland and Greenland. Its choice of growth is barren, but healthy ground, among rocks, where it flowers in May.

The principal substitutive leaves for the Uva-Ursi of commerce are those of *Vaccinium Vitis Idæa*, Linn., of which Mr. J. H. Sears says:* "This is the plant that the Shakers gather instead of the Uva-Ursi; they go 40 or 50 miles for it when Uva-Ursi is abundant in their own ground. Uva-Ursi is common at Groton, Mass.; still the Shakers of that vicinity go to Danvers, where there is a small patch of *Vitis Idæa*, which they gather instead." Comparing the leaves of specimens sent by Mr. Sears, I find the following distinction:

Uva-Ursi.	Vitis Idæa.
Bearberry.	Cowberry.
Blade, oblanceolate to oblong, never spatulately narrowed, as in Vitis Idæa; reticulately broad-veined beneath, not dotted.	*Blade*, narrowly oblanceolate, seldom, if ever, tending toward oblong; very distinctly black-dotted and narrow-veined beneath.
	The character of the leaves being toward the apex crenate and distinctly revolute,† is not at all constant, nor is it distinctive.

Uva-Ursi is an ancient astringent, though used but little until the 13th century by the "physicians of Myddfai." Clusius described the plant, in 1601, as the Ἄρκτου σταφυλή of Galen, useful as an hemostatic; it was not much used, however, until about the middle of the eighteenth century, when it began to prove, in the hands of De Haen and Gerhard, an excellent remedy in nephritic disorders. It was admitted to the London Pharmacopœia in 1763. From this time it came into more or less general use as an astringent tonic and diuretic in various diseases, particularly, however, in dysuria, chronic vesical catarrh, cystitis with or without ulceration, calculous disorders, and kindred affections, as well as in irritations of the genital tracts, such as gleet, gonorrhœa, leucorrhœa, blenorrhœa, etc. In all these disorders, however, it proved itself simply palliative in most cases, and many times fell into disuse. Dr. Bourin, of Oxford, recommended it highly in phthisis, but it only abated the hectic fever from reduction of the heart's action. In late years it has been called attention to as a uterine excitant, very useful in prolonged parturition from atony; it is claimed that it is fully as sure as Secale, while the contractions resulting are more prolonged, while less painful, and dangerous to the child. The general dose in nephritic complaints has been: of the powdered leaves, ℈ij to ʒj, and of the decoction, *coch. mag.* ij to iv, *quater in die;* and in parturition, grs. xv, in infusion, a cupful every hour, one, or at most two doses, being fully sufficient.

The American Aborigines smoke the dried leaves with tobacco, making a mixture called *Sagack-homi* in Canada, and *Kinikinik* among the Western tribes; this is the *Larb* of the Western hunters.

---

* In a letter from Peabody Academy of Science to the author.

† Bentley and Trimen, *Med. Pl.*, 163.

The leaves of Uva-Ursi are officinal in the U. S. Ph., as well as *Extractum Uva-Ursi Fluidum;* in Eclectic practice the preparation is *Decoctum Uva-Ursi.*

PART USED AND PREPARATION.—The fresh leaves, particularly those of the sterile branches, gathered in September or October, are to be chopped and pounded to a pulp and weighed. Then take two-thirds' part by weight of dilute alcohol, add to it the pulp with constant agitation, and strain the whole through a piece of new linen. The grainy menstruum thus obtained should be allowed to stand eight days, in a well-stoppered bottle, in a dark, cool place, before filtering.

The tincture obtained by filtration should be opaque, and have, in thin layers, a deep blackish-brown color by transmitted light; its odor should be heavily herbaceous and slightly terebinthic; its taste extremely astringent and slightly bitter; and its reaction acid.

CHEMICAL CONSTITUENTS.—According to many observers, especially Prof. Murray and Dr. J. S. Mitchell, water is the best menstruum with which to extract the principles of this plant. The large amount of tannin contained in the leaves causes them to be extensively gathered in Iceland, Sweden, and Russia for tanning fine grades of leather.

[*Arbutose.**—Treat the mixture of several successive decoctions of the coarsely-powdered leaves of Uva-Ursi with subacetate of lead, thereby precipitating the tannin and extractive matters. Decolorize the liquid with sulphydric acid, and evaporate quickly. This process decomposes a certain quantity of arbutin and a sticky crystalline mass is produced (Arbutose), containing 55 per cent. *arbutin*, 35 per cent. glucose, and 10 per cent. water. After drying this body in air as far as possible, and treating it with charcoal, followed by successive quantities of alcohol and distilled water, crystallized arbutin may be obtained.]

Arbutin,† $C_{25}H_{34}O_{14}$.‡—This glucoside, in an impure state, was first determined by Hughes,§ and called by him *Ursin;* Kawalier, however, in 1853, isolated the body in a pure state, and gave it the name it now bears. Arbutin crystallizes in handsome, white, shining, radiate forms, odorless, bitter, and neutral; they lose water at 100° (212° F.), fuse at 160° (338° F.), are soluble in water, slightly soluble in alcohol, and insoluble in ether. By heating the crystals with peroxide of manganese they are resolved as follows:

$$\underset{\text{Arbutin.}}{C_{25}H_{34}O_{14}} = \underset{\text{Kinone.}}{4C_6H_4O_2} + \underset{\text{Formic Acid.}}{CH_2O_2} + \underset{\text{Water.}}{4H_2O}.$$

Kinone,‖ $C_6H_4O_2$.—This very volatile body readily sublimes in brilliant golden-yellow acicular crystals, possessing a suffocating smell. They are slightly soluble in cold, freely soluble in hot, water, in alcohol, and in ether.

---

* Lewin, *Pharm. Jour.*, 3, xiv, 490.

† Kawalier, $C_{32}H_{44}O_{19}$. Strecker, $C_{12}H_{16}O_7$.

‡ Hlasiwetz and Habermann.

§ J. C. C. Hughes, in *Am. Jour. Phar.*, 1847, 90.

‖ *Quinone.*

Arbutin, during its passage through the body, undergoes the following change,* which is also brought about outside the body by the action of emulsin, or by boiling with dilute sulphuric acid:

Arbutin. Water. Glucose. Hydrokinone. Methyl-hydrokinone.

$$C_{25}H_{34}O_{14} + 2H_2O = C_6H_{12}O_6 + C_6H_4(OH)_2 + C_6H_4(OH.OCH_3).$$

Hydrokinone,† $C_6H_6O_2$.—This dioxybenzene forms in colorless rhombic prisms, melting at 169°–172° (336.2°–341.6° F.), and subliming, partly decomposed, at higher temperatures.

In the mother-liquor, after the crystallization of Arbutin, the following substances are found:

Ericolin, $C_{34}H_{56}O_{21}$.—This amorphous, very bitter glucoside results as a yellowish-brown mass, softening at 100° (212° F.), and resolving, under the action of dilute sulphuric acid, as follows:

Ericolin. Water. Glucose. Ericinol.

$$C_{34}H_{56}O_{21} + 4H_2O = 4C_6H_{12}O_6 + C_{10}H_{16}O.$$

Ericinol, $C_{10}H_{16}O$, is a yellowish, or nearly colorless resinifying oil, having a peculiar odor.‡ It also exists free in the volatile oils of many Ericaceæ; that from *Ledum* having a blue-green color, a disagreeable odor, a burning and bitter taste, and boils at 240°–250° (464°–482° F.). On boiling it with hydrated lime it yields a hydrocarbon of the composition $C_{20}H_{16}$.§

Urson, $C_{20}H_{32}O_2$.||—This colorless, tasteless, crystalline body melts at 198°–200° (388.4°-392° F.), sublimes at higher temperatures without visible change, is insoluble in water, and slightly soluble in alcohol and ether.§

Gallic, or *Trioxybenzoic, Acid*, $C_7H_3O_2(OH)_3$.—This acid occurs in a free state in this and many other plants, and, in combination with tannic acid, in numberless others; it dissolves in 100 parts of cold water, from which it crystallizes in fine, silky needles, slightly acid and astringent. Gallic acid gives a deep blue color with ferric salts, melts at 200° (392° F.), and resolves at 210° (410° F.), as follows:

Gallic Acid. Carbonic Dioxide. Pyrogallic Acid.

$$C_7H_3O_2(OH)_3 = CO_2 + C_6H_6O_3.$$

Tannin.—This glucoside is generally considered to have the composition $C_{14}H_{10}O_9$, which proves it an anhydride of gallic acid, and its true name Digallic Acid.¶ The difficulty of obtaining tannin pure renders its composition, however, somewhat doubtful; when as pure as possible it results as a porous, greenish-yellow, friable mass, freely soluble in water, less so in alcohol, and insoluble in ether. The tannic acids, so called, are a group of bodies widely diffused through the vegetable kingdom, the species containing them usually lending a portion of

---

* M. von Mering, *Arch. f. d. gesam. Physiol.* 1877, 276.

† Arctuvin, Quinhydrone, Hydroquinone, Hydrochinone.

‡ Gmelin, *Chem.*, xvi, 28.

§ Wittstein.

|| Trommsdorf.

¶ Gallic Acid. Water. Tannin.

$$(C_7H_6O_5)_2 - H_2O = C_{14}H_{10}O_9.$$

their name to specify the body as found in them—(*Caffee*-tannic Acid, *Quino*-tannic Acid, *Catechu*-tannic Acid, *Kino*-tannic Acid, etc.). With gelatine, these tannins form an insoluble compound; and with ferric chloride they yield bluish-black or green precipitates. They combine readily with animal skin, giving it the property of resisting putrefaction, which forms part of the process called tanning.

Resin, gum, pyrocatechin,* extractive matters, and the usual plant constituents, are also found.†

PHYSIOLOGICAL ACTION.—Should we prescribe on the palliative principle, and at the same time believe in disinfection by killing germs, I could hardly point to a drug more adapted to diseases of the kidneys, bladder, and urethra than *arbutin*, which is changed in the renal tract to hydrokinone, a sort of phenol, which is in itself a germicide, the arbutin being more or less innocuous and at the same time a diuretic; it has, however, caused an eruption of the skin.‡

Uva-Ursi itself causes vomiting and purging, involuntary passage, bloody and green urine, and reduces the heart's action; further than this little is known of its direct effects.

DESCRIPTION OF PLATE 100.

1. End of a flowering branch.
2. Fruiting branch, Salem, Mass., Nov. 22, 1886.
3. Leaf, under surface.
4. Flower.
5. Longitudinal section of flower.
6. Pistil.
7. Stamen, front and side view.
8. Drupe.
9. Pyrenæ consolidated into a stone.
10. Transverse section of a pyrena.
12. Longitudinal section of a seed.
13. Horizontal section of a seed.
14. Section of ovary.
15. Separate pyrena.

(4–15 enlarged.)

---

* See page 40–2.

† Further bibliography in this department: *Gray's Elements;* Gmelin, *Chem.*, xv, 419, xvi, 28; *Phar. Jour.*, 3, v, 401; *Am. Jour. Phar.*, xxvii, 334; 1873, 197; 1886, 385; 1885, 139; *Chem. Gaz.*, 1853, 61; Wittstein, *Org. Constit. Plants;* Schorlemmer, *Chem. Carb. Comp.*

‡ Lewin, *ibid.*

F.M. ad nat del. et pinxt.

EPIGÆA RÈPENS, Linn.

Tribe.—ANDROMEDEÆ.

GENUS.—**EPIGÆA,*** LINN.

SEX. SYST.—DECANDRIA MONOGYNIA.

EPIGÆA.

TRAILING ARBUTUS.

SYN.—EPIGÆA REPENS, LINN.

COM. NAMES.—TRAILING ARBUTUS, MAY FLOWER, GRAVEL PLANT, GRAVEL WEED, GROUND LAUREL, MOUNTAIN PINK, WINTER PINK.

A TINCTURE OF THE FRESH PLANT EPIGÆA REPENS, LINN.

Description.—This fragrant spring flower, blossoming amid the verdure of its previous year's growth, is prostrate or trailing* from a mass of perennial, red-brown, fibrous *roots* thickly beset with a tangle of rootlets; the *stem* is rounded and conspicuously hairy, the bark and hairs having a rusty color. *Leaves* alternate, evergreen, reticulate, ovate-cordate and entire, from 1 to 2 inches long, and relatively one-half as wide, the edges and under surface rusty hairy. *Inflorescence* apical or axillary; the *flowers* spring from dry, scaly bracts, and have a delicate pink, a deep rose-color, or are in some cases white, and emit a fragrant, spicy aroma. *Sepals* 5, dry, nearly separate, ovate-lanceolate, acute. *Corolla* monopetalous, salver-form, with 5 ovate, spreading lobes, the tube hairy inside. *Stamens* 10, shorter than the corolla; *filaments* hairy at the base; *anthers* linear, opening longitudinally; *pollen* of compound grains as in the preceding, but smaller. *Ovary* globular, depressed, 5-celled, many-seeded; *style* slender, forming a zone about the minutely 5-lobed stigma. *Capsule* 5-lobed, 5-celled, 5-angled, many-seeded, inclosed in the persistent calyx; *placentæ* large, 2-celled; *seeds* ovate.

History and Habitat.—Upon rich, damp, mossy banks throughout the central part of North America east of the Mississippi, under the shade and protection of low pines and hemlocks, in the early sunny days of spring, sometimes even peeping from under a snow-bank, appear the sweet-scented flowers of this much-sought-after little plant; so closely do the prostrate spreading stems cling to and mingle with the mosses, to which they in their rusty hairiness bear great similitude, that one of its common names in some localities is *Moss Beauty*. Epigæa flowers until May, and ripens its fruit in July.

It is stated that in lithic acid gravel, and some forms of nephritis, cystitis and vesical catarrh, its use has often been of greater benefit than uva-ursi or buchu.

---

* ἐπί, *upon*, γῆ, *the earth.*

Epigæa has no place in the U. S. Ph. In the Eclectic Materia Medica its officinal preparations are *Extractum Epigeæ Fluidum*, and *Infusum Epigeæ;* it is also the principal component of *Infusum Epigeæ Compositum*, together with Eupatorium purpureum, Aralia hispida, and Radix althæa officinalis, this being one of their much-used diuretics.

PART USED AND PREPARATION.—The fresh leaves, or the whole plant gathered when budding to blossom, being chopped and pounded to a pulp and weighed, two parts by weight of alcohol are taken, the pulp mixed with one-sixth part of it, and the rest of the alcohol added. After thorough succussion the whole is poured into a well-stoppered bottle and allowed to stand for eight days in a dark, cool place. The tincture is then decanted, strained and filtered.

Thus prepared it is opaque, showing in thin layers a deep brown color; it has a pleasant woody taste, is slightly astringent, and of a decided acid reaction.

CHEMICAL CONSTITUENTS.—The three glucosides, *urson*, *ericolin*, and *arbutin* (vide Uva-ursi, 100). *Formic acid* and a body having properties similar to *gallic acid* have been determined in this plant.

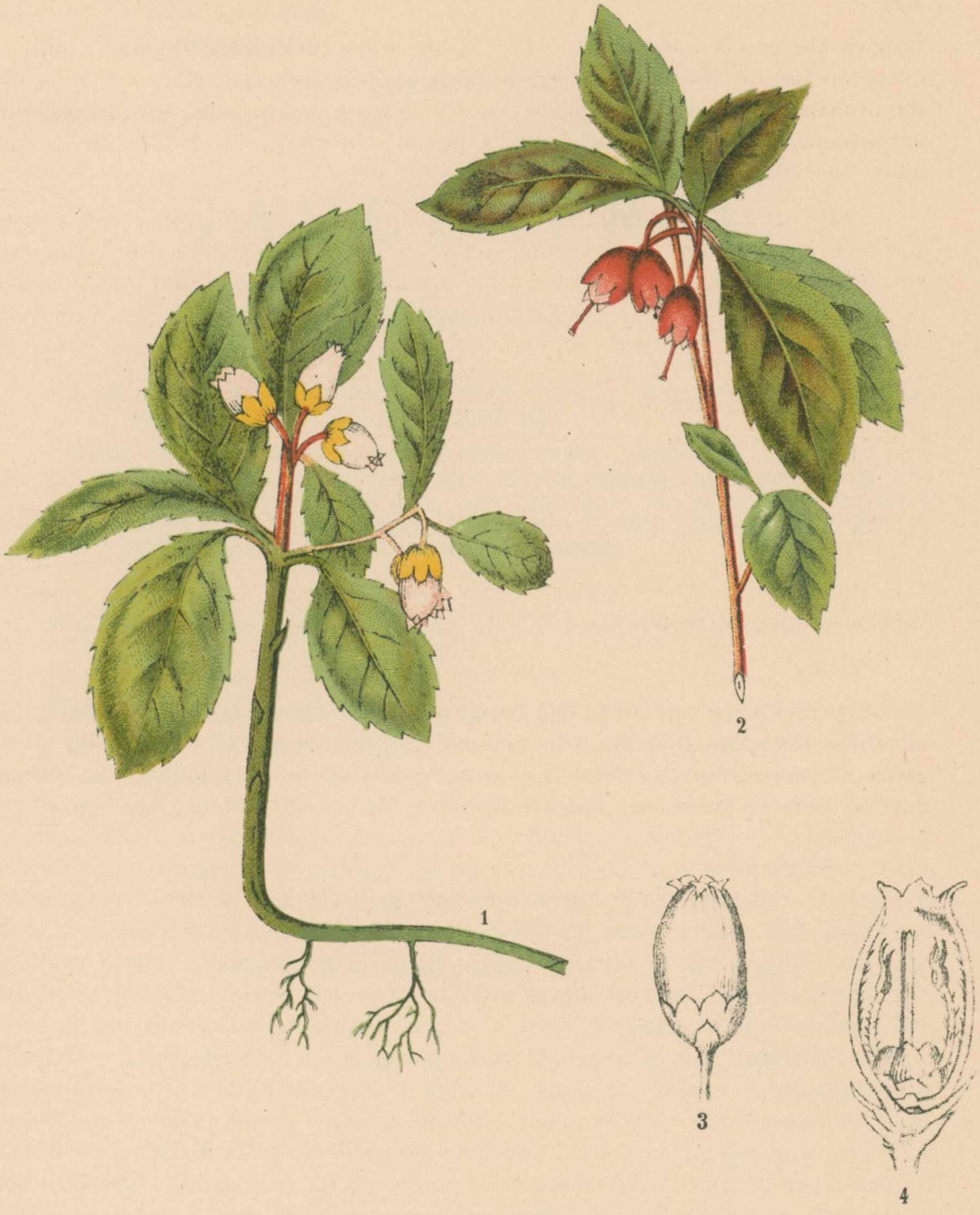
Tannic Acid.—The amount of this body existing in epigæa is given by Bowman as 3.5 per cent.

Ericinol.—$C_{10}H_{16}O$, a pale-yellow, aromatic oil, is also present.

PHYSIOLOGICAL ACTION.—Epigæa, so far as is determined at present, shows no important symptoms of physiological disturbance of the system. The provings are scanty; the only one so far published was made upon myself, and may be found in the "Hom. Physician," Oct., 1881, vol. 1, No. 10, pp. 486-9.

DESCRIPTION OF PLATE 101.

1. Flowering branch, from Waverly, N. Y., April 3, 1880.
2. Flower showing calyx (enlarged).
3. Section of flower (enlarged).
4. Stamen (enlarged).
5. Pollen grains x 380.



F M. ad nat. del. et pinxt.

GAULTHERIA PROCUMBENS, Linn.

Tribe.—ANDROMEDEÆ.

GENUS.—**GAULTHERIA**,* LINN.

SEX. SYST.—DECANDRIA MONOGYNIA.

GAULTHERIA.

WINTERGREEN.

SYN.—GAULTHERIA PROCUMBENS, LINN.; GAULTHERIA HUMILIS, SALISB.; GAULTIERA REPENS, RAF.

COM. NAMES.—CREEPING WINTERGREEN, CHECKER BERRY, PARTRIDGE BERRY, BOX BERRY, SPICE BERRY, TEA BERRY, MOUNTAIN TEA,† JERSEY TEA, GROUND HOLLY, AROMATIC WINTERGREEN, GROUSE BERRY, DEW BERRY, RED BERRY. HILL BERRY, (FR.) THE du CANADA; (GER.) BERGTHEE.

A TINCTURE OF THE FRESH LEAVES OF GAULTHERIA PROCUMBENS, LINN.

Description.—This well-known perennial, spicy-aromatic evergreen grows, in its upright height, from 3 to 5 inches, the true *stem* creeping, generally below the surface, and resembling a root. The flowering branches upright, stem-like, naked below and leafy at the top. *Leaves* alternate, upon very short petioles, obovate or oval, with a wedge-shaped base and very finely serrate edges; thick, smooth and shining. *Inflorescence* axillary; *flowers* usually single, sometimes more, upon nodding, two-bracted pedicels from the base of the upper petioles. *Calyx* five-lobed. *Corolla* inflated-cylindrical or pear-shaped, hairy within, with five small revolute teeth. *Stamens* ten, included within the tube of the corolla; *filaments* flat, hairy, curving toward the style; *anthers* large, introrse, two-celled with two awns at the apex of each cell, opening by a terminal pore. *Ovary* smooth, five-lobed, five-celled, depressed, situated upon an hypogenous disk; *placenta* axillary; *style* simple, cylindrical, thick, longer than the stamens; *stigma* blunt, apparently entire, but in reality faintly marked into five lobes. *Fruit* a depressed, five-lobed, -celled and -valved, many-seeded pod, invested, when ripe, by the now thickened and fleshy calyx, thus forming a globose, bright red, edible berry, having a depression at its apex, surrounded by crenations formed of the thickened calyx teeth. *Seeds* situated upon the axis, minute, very irregularly shaped, the average being rounded-triangular, with concave or convex surfaces; *testa* light-yellow, with fine hexagonal reticulations. A description of the Ericaceæ will be found under Uva-Ursi, 100.

---

* Dedicated to Dr. Gaultier of Quebec. The orthography of whose name, after passing through botanical works as "Gaulthier" and "Gautier," was finally settled by the records of Quebec, searched by Prof. Brunet, as "Gaultier." (Gray)

† The leaves of this plant formed one of the substitutes for *Thea Chinensis* during the Revolutionary War.

History and Habitat.—The wintergreen is indigenous to the eastern portion of the United States, growing from Maine to South Carolina, and westward to Central Kentucky, especially among the mountains in the shade of pines, flowering in July. The strange fruit hangs, and retains its bright color, until the next spring, then rots upon the pedicels or drops to the ground, thus allowing the escape of the seeds. The common names given to *Gaultheria procumbens*, *Chimaphila umbellata*, and *Mitchella repens* are very confusing, being interchanged in different sections of the country. The berries when fresh, and the young leaves, are very pleasant to the palate, being esteemed highly by many, and forming an article for sale by hucksters in some localities. They form, especially among the mountains of Pennsylvania, together with those of *Mitchella*, the principal food of partridges, grouse and deer, in the late autumn months.

Distillation of the oil of wintergreen, for use as a flavoring extract—to which its principal commercial value is due—is confined to men of limited means, in those districts where its growth is most abundant. The apparatus used is simple and movable, being shifted as the supply of leaves gives out. It consists usually of a copper whiskey-still. This is placed near some rivulet with a sufficient fall to keep the cooler filled. It is entirely invested by brick, with the exception of the cap, filled with leaves covered with water, and heated by an open fire beneath. The volatile oil, together with the steam, passes through the condensing worm into the receiver, which is kept filled with water. The oil is collected by a separating funnel, placed in the bottom of the receiver, and the water used over and again to economize the product. The average yield is ten pounds from a ton of the leaves; greater in dry seasons.

Most of the so-called oil of wintergreen is made from young birch trees (*Betula lentæ*), in a similar manner to the process described above. Mr. G. W. Kennedy decides* that there is but little variance between the oil of wintergreen and that of birch. This, as far as he determined after many tests, consists only in a slight difference in the boiling point.

Gaultheria is only mentioned in the U. S. Ph., no officinal preparation being given. In the Eclectic Materia Medica it meets with the same lack of popularity.

PART USED AND PREPARATION.—The fresh leaves, gathered in summer, are chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it and the rest of the alcohol added. The whole is then poured into a well-stoppered bottle and allowed to remain for eight days in a dark, cool place. The tincture is then separated by straining and filtering. Thus prepared, it is of a deep brownish red color by transmitting light through thin layers, or black and opaque when in quantity. It retains the pleasant odor of the plant. The taste peculiar to the plant is covered at first by its great astringency, but gradually becomes apparent as the natural condition of the tongue returns. Its acidity is marked.

CHEMICAL CONSTITUENTS.—The general constituents of this plant are the same as those described under Uva-Ursi, 100, *viz.*, arbutin, urson, ericolin and tannin.

* *Am. Jour. Phar.*, 1882, p. 49.

Oil of Gaultheria. This body is a mixture of the volatile oil of the plant, salicylate of methyl, gaultherilene and gaultheric acid, forming the heaviest of the known essential oils, its sp. gr. being 1.173. Unless purified by macerating in animal charcoal, it has a reddish color, and boils at 200° (392° F.).

Gaultherilene, $C_{10}H_{16}$. This hydrocarbon is one of the constituents of the mixed oil.

Gaultheric acid. Methyl-salicylic acid, $C_6H_4\begin{cases}O.CH_3\\CO_2H.\end{cases}$ This methyl-ether of salicylic acid, is obtained from the oil of wintergreen through the agency of an alkali. It crystallizes in plates, melting at 98.5° (209.3° F.). It is isomeric with the next, from which it differs by being a strong acid.

Salicylate of methyl, $C_6H_4\begin{cases}OH\\CO.COH_2.\end{cases}$ This body constitutes the principal part of the compound oil distilling over after the passage of the volatile body when the temperature is raised to 222° (431.6° F.). It exists as an oily liquid, possessing a very pleasant penetrating odor and a sweet, aromatic, refreshing taste. (Schorlemmer, Wittstein.) All of the above constituents are soluble in alcohol.

PHYSIOLOGICAL ACTION.—The following digest of the action of Gaultheria is from Dr. T. J. Gallaher (*Med. Ex.*, 8, 347) and Drs. W. E. Townsend and Hooker (*Rec. Boston Soc. Med. Imp.*), the first from an overdose of the oil, the last from large amounts of the essence: Stupidity, swelling of the tongue and very active inflammation of the stomach, attended with a highly morbid desire for food, with a painful tenderness in the epigastric region and violent retching and vomiting whenever anything entered the stomach; slow, laborious breathing, with loud respiration, but no stertor; hot skin, high pulse and restlessness.

DESCRIPTION OF PLATE 102.

1. A branch in flower, Binghamton, N. Y., July 21st, 1883.
2. A fruiting branch in October.
3. Flower (enlarged).
4. Flower (section enlarged).

Ĉ.M. ad nat del. et pinxt.

KÁLMIA LATIFÒLIA, Linn.

Tribe.—RHODOREÆ.

GENUS.—**KALMIA,*** LINN.

SEX. SYST.—DECANDRIA MONOGYNIA.

KALMIA.

MOUNTAIN LAUREL.

SYN.—KALMIA LATIFOLIA, LINN.; CISTUS CHAMÆRHODODENDROS, ETC., PLUK.; LEDUM FLORIBUS BULLATIS, ETC., TREW.

COM. NAMES.—MOUNTAIN LAUREL, AMERICAN LAUREL, CALICO-BUSH, SPOONWOOD, BIG IVY, ROSE LAUREL, ROUND-LEAVED LAUREL, SHEEP-LAUREL,† LAMB-KILL,† WICKE; (FR.) GRANDE KALMIE; (GER.) GROSS KALMIE.

A TINCTURE OF THE FRESH LEAVES OF KALMIA LATIFOLIA, LINN.

Description.—This beautiful evergreen shrub attains a height of from 4 to 10 or more feet. *Stem* smooth; *branches* more or less terete, irregular, and tortuous. *Leaves* more or less scattered but tending to alternation, they are thick, coriaceous, glabrous, dark and shining green both sides; in form they are elliptical or ovate-lanceolate, acute at both ends and entire. *Inflorescence* simple or clustered, naked, umbel-like corymbs, terminal upon the branchlets; *pedicels* long, arising from leaf-like bracts; *flowers* clammy-pubescent. *Calyx* rotate, persistent, somewhat smaller than the fruit; *limb* 5-parted; *teeth* deltoid. *Corolla* somewhat hypocrateriform, infundibular, or campanulate; furnished with 10 mammæ, into the internal depressions of which the anthers are held until irritated; *tube* short; *limb* 5-lobed; *lobes* semi-ovate, acute. *Stamens* 10; *filaments* smooth, filiform; *anthers* 2-celled, each opening by a large apical pore or chink. *Ovary* globose; *style* terminal, filiform; *stigma* capitate. *Fruit* a globose, 5-celled, pubescent, coriaceous capsule; *seeds* many, oblong; *testa* thin and somewhat loose.

History and Habitat.—The laurel bush is indigenous to North America, growing from Canada and Maine southward and westward to Ohio, and on the mountains as far as Florida. Its large clusters of beautiful flowers, embosomed in the rich, dark green foliage so characteristic of the plant, is one of the most attractive points of beauty of our mountain woods in May and June. In southern Pennsylvania, on the Alleghanies, this shrub often attains the dimensions of a small tree, sometimes reaching as high as 30 feet. The wood when dry is hard and dense, somewhat like that of the box (*Buxus*), and is used for the manufacture of household implements, such as ladles, spoons, forks, etc.; for the handles of small tools, and for cog-wheels and the like.

---

* Peter Kalm, a Swedish botanist and a pupil of Linnæus.

† More properly names applied to *K. angustifolia.*

The previous uses of this plant in medicine were of a very limited character. A decoction was used in domestic practice for various forms of tinea capitis, psora and herpes; also in secondary syphilis. It has been recommended in inflammatory fevers as a cardiac depressor; its astringency was utilized also by the application of the drug in diarrhœas and hemorrhages of the bowels.

Kalmia is not officinal in the U. S. Ph.; in the Eclectic Materia Medica its preparations are: *Decoctum Kalmiæ; Tinctura Kalmiæ;* and *Syrupus Phytolaccæ Compositus.**

PART USED AND PREPARATION.—The fresh leaves, gathered while the plant is in blossom, are treated as in the preceding species. The tincture thus prepared is opaque; in thin layers it has a deep brownish-orange color; it retains the peculiar odor of the bruised leaves, has an extremely astringent and somewhat bitter taste, leaves a slightly scalded sensation upon the tongue, and has a strong acid reaction.

CHEMICAL CONSTITUENTS.—A special active principle has not as yet been determined in this plant. The analyses of Bigelow,† Bullock,‡ and Kennedy,§ resulted in the determination of *Arbutin*,‖ tannic acid,†‡ resin,†‡ fat,‡ gum,†‡ wax,‡ an acid body uninvestigated,‡ extractive,‡ yellow coloring matter,‡ a mannite,‡ and the usual plant constituents.

PHYSIOLOGICAL ACTION.—Laurel leaves have always been deemed poisonous, especially by the Indians and the laity. Their action upon sheep, especially lambs, has given two of its vernacular names, *Sheep-laurel* and *lamb-kill.* Catesby says:¶ "deer feed upon its green leaves with impunity; yet when cattle and sheep, by severe winters deprived of better food, feed on the leaves of this plant, a great many of them die annually." And Kalm gives the following:** "The leaves are poison to some animals, and food for others; experience has taught the people, that when sheep eat of these leaves, they either die immediately, or fall very sick, and recover with great difficulty. The young and more tender sheep are killed by a small portion, but the older ones can bear a stronger dose. Yet this food will also prove mortal to them if they eat too much of it. The same noxious effect it shows in regard to calves, . . . they fall very sick, swell, foam at the mouth and can hardly stand. The sheep are most exposed to be tempted with these leaves in winter, . . . being greedy of all greens; especially if snow still lies upon the ground. Horses, oxen, and cows, which have eaten them, have likewise been very ill after the meal." He farther adds that these leaves form a winter food for stags, and if killed during the time of feeding and the entrails given to dogs to eat, they "become quite stupid, and, as it were, intoxicated, and often fall so sick that they seem to be at the point of death; but the people who have eaten the venison have not felt the least inconvenience." Dr. Bigelow states, as do other observers, that it is a common belief that the flesh

---

* Phytolacca, Ampelopsis, Cimicifuga, and Kalmia.

‡ *Am. Jour. Phar.*, 1848, p. 264.

‖ Kennedy (see Uva Ursi, 100).

** *Travels in North America*, vol. 1, p. 335.

† *Am. Med. Bot.*, vol. 1, p. 136.

§ *Am. Jour. Phar.*, 1875.

¶ *Op. cit.*, p. 137.

of the Partridge, after feeding upon the leaves and fruits, becomes of itself poisonous; this Wilson the ornithologist denies on trial, though other observers declare it a fact. Dr. Bigelow judges that the illness caused in animals is due to the indigestibility of the plant; other authors think that those persons made ill by eating the flesh of the partridge under the circumstances mentioned, are made so from a decomposed state of the meat. Beck* appears to deem the flesh poisonous from eating the berries as above.

From the experience of nearly all persons who have experimented upon themselves with a tincture or decoction of the leaves, it is obvious that the effects produced on cattle after grazing on the leaves, and on persons eating of "poisoned" partridges, are due to the plant itself, not to indigestion or putrefaction. Dr. Bigelow's later observations,† agree *in toto* with our provings. He gives the following as its action: "The flesh of the bird impairs the functions of the brain and acts directly as a sedative poison, secondarily affecting the digestive and circulatory organs." The symptoms arising in those proving the drug are: Vertigo and headache; almost complete loss of sight; pale, somewhat livid countenance; salivation and difficult deglutition; thirst, nausea and vomiting, with oppression and pressure in the region of the stomach; difficult respiration with great palpitation and fluttering of the heart, followed by an irregular, feeble, and slow pulse; weakness, weariness and pains in the limbs; coldness of the surface and great prostration.

DESCRIPTION OF PLATE 103.

1. End of flowering branch, Waverly, N. Y., June 15th, 1880.
2. Flower.
3. Pistil.
4. Stamen.
5. Pollen x 200.

(3 and 4 enlarged).

Kalmia Angustifolia, Linn., seems from the experience of others to be the most poisonous species, its habitat is the same as that of K. latifolia. It may be the confusion of species that causes so much doubt upon the questions of toxicology. It is stated‡ that a few drops of a saturated tincture of the plant caused the death of a rattlesnake when poured upon it. We cannot be certain that our preparations and those of the provers were made from K. latifolia alone; therefore I append a differentiation for future reference in experimentation, judging that a thorough revision and re-proving of the two species separately, would be vastly important to us.

KALMIA.

K. LATIFOLIA. (Calico-bush, Mountain Laurel.)	K. ANGUSTIFOLIA. (Sheep-laurel, Lamb-kill.)
Height 4 to 30 feet.	*Height* 2 to 4 feet.
Leaves alternate or scattered, ovate-lanceolate or elliptical, acute, bright, rich green both sides.	*Leaves* opposite or in whorls of three, narrowly oblong, obtuse, light green above, pale to whitish beneath.
Inflorescence terminal, clammy, pubescent; *flowers* pink to nearly white.	*Inflorescence* lateral, slightly glandular; *flowers* red, and nearly two-thirds smaller.
Fruit a depressed glandular capsule.	*Fruit* a depressed smooth capsule, upon a recurved pedicel.

* *Medical Jurisprudence*, p. 864.

† Nearly 40 years after the publication of his *Am. Med. Bot.*, quoted above.

‡ By Dr. Barton.

F M. ad nat. del. et pinxt.

CHIMÁPHILA UMBELLÀTA, Nutt.

S. ORD.—PYROLEÆ.

GENUS.—**CHIMAPHILA,*** PURSH.

SEX. SYST.—DECANDRIA MONOGYNIA.

CHIMAPHILA.

PIPSISSEWA.

SYN.—CHIMAPHILA UMBELLATA, NUTT., CHIMAPHILA CORYMBOSA, PURSH., PYROLA UMBELLATA, LINN., PYROLA FRUCTICANS, PARKINSON.

COM. NAMES.—PIPSISSEWA, WINTERGREEN, PRINCE'S PINE, BITTER WINTERGREEN, GROUND HOLLY; (FR.) PYROLE OMBELLÉE; (GER.) DOLDENBLÜTHIGES HARNKRAÜT, ODER WINTERGRÜN.

A TINCTURE OF THE FRESH PLANT *CHIMAPHILA*, EITHER *UMBELLATA* OR *MACULATA*, OR BOTH, AS THE PROVINGS HAVE BEEN MADE WITHOUT DISCRIMINATION.

Description.—This small, slightly woody, nearly herbaceous evergreen perennial, springs from a long, cylindrical, creeping, yellowish *root*, about one-eighth to one-quarter of an inch in diameter, giving off numerous fine rootlets, and sending up many branches, which terminate in leafy and flowering stems alternately. *Stem* simple, or sometimes branched at the base, 3 to 6 inches high before the flowering season. *Leaves* mostly in several imperfect whorls, or sometimes scattered about the upper portion of the stem; they are dark green above, paler below, thick, shining, wedge-lanceolate, acute at the base, sharply saw-toothed, amaculate, short-petioled, and from one and a half to two inches long, by one-quarter to one-half an inch broad. *Peduncle* from 3 to 6 inches long, erect, smooth, terminating in from 4 to 7 *pedicels* covered with a very fine down, nodding in flower, erect in fruit, and forming a loose umbel or corymb. *Calyx* much smaller than the corolla; *sepals* five, blunt, persistent, slightly hairy. *Corolla* of five *petals* rounded, concave and spreading. *Stamens* ten, free, inserted under the pistil; *filaments* at first convex, obovate, fleshy, then concave, filiform and hairy; *anthers* large, extrorse in the bud but becoming inverted in flower, more or less conspicuously 2-horned, 4-celled, and opening by two pores; *pollen* grains white, compounded of four more or less globose granules. *Ovaries* 5, connected about a fleshy receptacle in such a manner as to form a depressed globose mass, surrounded at its base by a glandular zone; *ovules* many, small, anatropous; *style* very short, rounded and wedge-shaped, the apex entering into the summit of the substance between the ovaries; *stigma* broad, convex, discoid, faintly marked by

* χεῖμα, *winter*, φιλέω, *to love.*

5 crenations. *Pod* depressed-globose, 5-lobed, 5-celled and 5-valved, loculicidal from the apex downward; *seeds* innumerable, minute.

Chimaphila Maculata, Pursh.—This species differs from the foregoing as follows: Peduncles from 1 to 5 flowered. Leaves ovate-lanceolate, obtuse at the base, the edges widely toothed, their upper surface white-maculate. A description of the natural order will be found under Arctostaphylos Uva-ursi.

History and Habitat.—This hardy little plant seeks the deep shaded portion of woodlands, where it flourishes best in the loamy formations of rotted leaves. It abounds throughout the central portion of North America, the forests of Siberia and the Northern countries of Europe. It blossoms here in June and July, fruiting in September. It is used among the aborigines of this country as a tonic and diuretic, as well as for rheumatic and scrofulous disorders, and latterly as an application to scrofulous and other open sores. Chimaphila is still retained in the U. S. Ph. as *Extractum Chimaphilæ Fluidum.* In the Eclectic Materia Medica its officinal preparation is *Decoctum Chimaphilæ;* it is also a component of *Syrupus Stillingiæ Compositus.*

PART USED AND PREPARATION.—The fresh plants while in flower are chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-sixth part of it, and the rest of the alcohol added. After stirring the whole well it is poured into a well-stoppered bottle and allowed to stand eight days in a dark, cool place. The tincture is then decanted, strained and filtered.

Thus formed it is opaque; thin layers have a deep, rich, reddish-brown color; it is decidedly bitter, slightly astringent, and has an acid reaction to litmus.

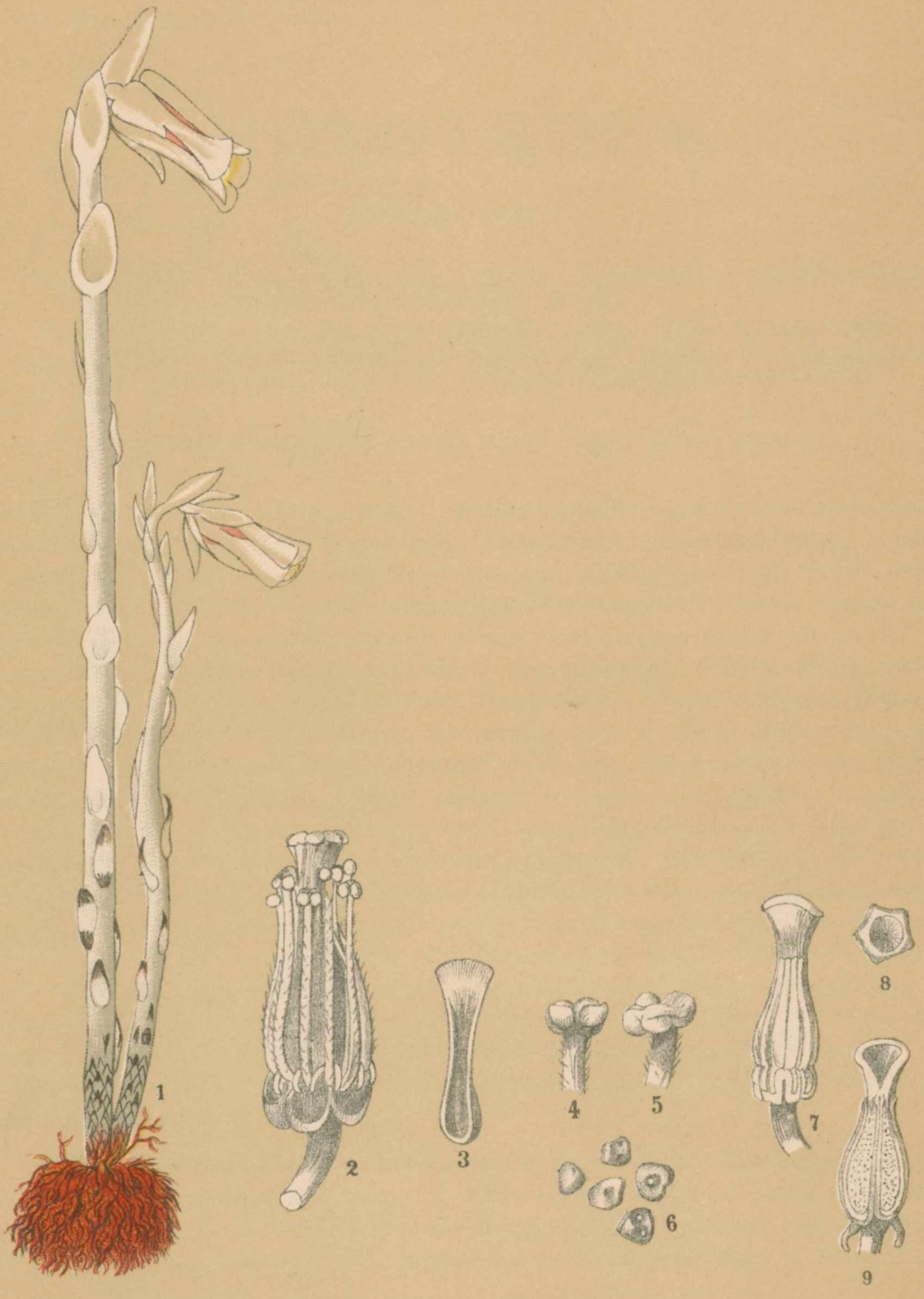
CHEMICAL CONSTITUENTS.—The chemistry of this plant corresponds with that of Arctostaphylos Uva-ursi (vide Uva-ursi, plate 100), differing probably little except in also containing the following principle, determined by Fairbank:

Chimaphilin.—On the aqueous distillation of the stems in a retort, a deposit of golden-yellow, odorless, tasteless crystals takes place upon the neck, the chemical nature of which has not yet been determined; their physical features are: a slight solubility in water, and a free solution in alcohol. The percentage of tannin in this plant is somewhat less than in Uva-ursi.

PHYSIOLOGICAL ACTION.—Here again Uva-ursi should be consulted. Chimaphila does not cause nausea and vomiting to the extent of Uva-ursi, while its diuretic action is greater. Its physiological action as such is undetermined.

DESCRIPTION OF PLATE 104.

1. Whole plant in fruit.
2. Flowering stem, Binghamton, N. Y., June 26, 1883.
3. Stamen (enlarged).
4. Fruit (enlarged).
5. Seed (enlarged).



Fm. ad nat. del. et pinxt.

MONÓTROPA UNIFLÒRA, Linn.

S. ORD.—MONOTROPEÆ.

GENUS.—**MONOTROPA,*** LINN.

SEX. SYST.—DECANDRIA MONOGYNIA.

MONOTROPA.

INDIAN PIPE.

SYN.—MONOTROPA UNIFLORA, LINN.; MONOTROPA MORISONIANA, MICHX.; MONOTROPA MORISONI, PERS.

COM. NAMES.—INDIAN PIPE, TOBACCO PIPE, PIPE PLANT, CORPSE PLANT, ICE PLANT, BIRD'S NEST,† NEST PLANT, FIT-ROOT, CONVULSION-ROOT, OVA-OVA; (GER.) EINBLÜTHIGE MONOTROPA.

A TINCTURE OF THE WHOLE FRESH PLANT MONOTROPA UNIFLORA, L.

Description.—This strange waxy or bluish-white, fleshy, inodorous, semi-parasitic herb, grows from 2 to 8 inches high. *Rootlets* very numerous, forming a ball of densely-matted fibres. *Stems* several from each clump of rootlets, simple, subcylindrical and smooth. *Leaves*, none; their place supplied below by numerous small triangular scales, which gradually enlarge and become ovate-spatulate foliaceous bracts toward the summit of the stem, where they pass into the *inflorescence*, composed of a single, terminal, declined flower, which becomes horizontal, then inclined as it performs its life-work, and rigidly erect in fruit. *Flower* slightly pubescent, entirely devoid of color except where the yellow anthers and flesh-colored pistil are disclosed. *Sepals* replaced by 2 to 5 bracteolate, irregular, lanceolate, caducous bodies; *petals* 5, erect, gouge-shaped, saccate at the base, marcescent. *Stamens* 10, shorter than the petals, each alternating at the base with a short, recurved, nipple-like process of the base of the ovary; *filaments* awl-shaped, pubescent; *anthers* horizontal, reniform, becoming one-celled and opening by transverse chinks; *pollen* simple, showing 1 to 2 translucent depressed spots.‡ *Style* columnar, short and thick; *stigma* naked, discoid, obtusely 5-angled, with a funnel-form depression in the centre. *Fruit* an erect, ovoid, 8- to 10-grooved, 4- to 5-celled loculicidal pod; *placentæ* large and sarcous; *seeds* very numerous, minute, subulate; *testa* loose, cellular, translucent. A description of the Ericaceæ will be found under Uva Ursi 100.

History and Habitat.—The Indian pipe grows in deep, rich, shady woods—especially those in which the beech abounds—from Florida to Mississippi, and thence northward, flowering in July in the North and from August to September in the South. This curious herb well deserves its name of *corpse plant*, so like is it to

---

* Μόνος, *monos*; τρόπος, *tropos*; one turn, from the facing of the flower.

† More applicable to *Daucus carota*, on account of the resemblance of the fruiting umbels to that structure.

‡ The pollen of Monotropa uniflora bears a striking resemblance in this regard to that of *Pendicularis Canadensis*.

the general bluish waxy appearance of the dead; then, too, it is cool and clammy to the touch, and rapidly decomposes and turns black even when carefully handled. The whole plant when wounded—especially, however, the floral envelope—emits a clear glutinous fluid. Attempts to preserve it in alcohol turn it a bluish-black, and tinge the preservative a deep reddish-violet hue, while the drying process turns it jet-black, leaving very little semblance to its natural appearance. The medical history of the plant begins with its use by the American Aborigines as an application in "sore eyes;" they valued a mixture of the juice with water highly as a soothing and often curative measure. Of this property Dr. Kunze* says in corroboration: "This is a drug very highly recommended† for overcoming nervous irritability, epilepsy, chorea, etc., when used in large doses—inwardly, of course—and for ophthalmic as well as other inflammations of delicate mucous surfaces outwardly applied, either in its fresh state or the preserved juice. I have myself used it very much in ordinary cases of inflamed eyes. both chronic and acute, and have never seen, or even before heard any evil effects following the most indiscriminate use.‡ Have applied it to the eyes of infants when only three days old, in *Ophthalmia purulenta infantum*, as well as in old age in every variety of so-called constitutions, and even where not successfully employed no ill effects have ever been observed thereafter." He farther on describes an incidental cure which is of interest botanically and medically: "Fourteen years ago—it was in the early part of July—I went woodcock-shooting with two friends, near Hackensack, N. J., and while taking some luncheon in a beech grove along the course of Saddle River, I found a large patch of ground literally covered with *Monotropa uniflora* in full bloom; it covered a space some five feet wide by nine feet long, a beautiful sight of snow-white stems and nodding flowers. Being in need of some just then, I proceeded to fill my game-bag, and to the question, what it was used for, answered: 'Good for sore eyes;' little thinking that the party addressed was suffering from a chronic inflammation of the eye-lids, the edges of which had a very fiery-red appearance. No sooner said than he proceeded to take in his game-bag a supply also, and he made very good use of it, as I ascertained afterwards. His inflamed lids were entirely cured in four weeks' time, and he has had no further trouble since, by applying the fresh juice of the stems he obtained while it lasted." Dr. King mentions the drug§ as "tonic, nervine, sedative and antispasmodic." The former uses of the herb in spasms of children, epileptiform and chorea-like, gave it the popular names so characterizing it. Dr. Stewart claimed that the dried herb was an excellent substitute for opium, "easing pain, comforting the stomach, and causing sleep." In spasmodic affections the usual dose is a teaspoonful of the dried root in powder; to this is often added the appropriate dose of valerian.

No mention is made of this drug in the U. S. Ph., and no officinal preparation appears in the Eclectic Materia Medica.

---

* *Bot. Gaz.*, 1878, Vol. iii, No. 6, pp 53, 54.

† In King's *Am. Disp.*, and Howard's *Botanic Medicine.*

‡ This clause he uses in discussing Mr. A. H. Young's case of poisoning, which I shall quote under the proper rubric.

§ *American Dispensatory*, 1880, p. 530.

PART USED AND PREPARATION.—The whole fresh flowering plant is treated as in the preceding drug. The resultant tincture has a brilliant orage-red color by transmitted light, a bitterish odor, a decidedly sweet taste, and a slightly acid reaction.

CHEMICAL CONSTITUENTS.—No analysis of this plant has, as far as I am able to determine, been made. The European species, also found here, *Monotropa hypopitys*, a tawny, many-flowered form, yields a volatile oil and *Salicylate of Methyl*.*

PHYSIOLOGICAL ACTION.—The only account of poisoning by this plant is that of Mr. A. H. Young.† This case was discussed by Dr. R. E. Kunze, as before mentioned, who was of the opinion that in the gathering the young lady handled *Rhus toxicodendron;* Mr. Young then again consulted the patient‡ and found that she was not susceptible to Rhus poison, and farther, that she had not personally gathered the plant, but met with her ill-fortune while examining it at home. As Mr. Young had the identical plant in his herbarium, he searched for rootlets of Rhus tox. clinging to the plant, but found none, and states it as his conviction that the case, though standing alone, is veritable. He says: "During the month of September a young lady brought me a plant which she said had poisoned her, and she desired its name. With some surprise, and perhaps I should have had none after considering its fostering food and close resemblance to the Fungi, I found the plant to be *Monotropa uniflora*. The circumstances of the case are as follows: The young lady while examining the plant, accidentally crushed the stem, and some of the juice was driven upon her lips. The mucous portions which were somewhat chapped became very much irritated, and began to inflame and swell considerably, while in two or three places upon the epidermal skin of the lip small ulcerous sores were formed. The effect remained some four or five days and then gradually healed. The whole effect was very much like a mild case of poisoning with *Rhus toxicodendron*." As we have no proving of this drug, we cannot as yet corroborate this case; there is, however, no plant in our country that promises so good results from provings.

DESCRIPTION OF PLATE 105.

1. Whole plant, Binghamton, N. Y., July 21st, 1884.
2. Flower with petals removed.
3. Petal.
4 and 5. Anthers.
6. Pollen, x 300.
7. Pistil.
8. Bird's-eye view of stigma.
9. Longitudinal section of pistil.

(2-9 enlarged.)

---

* See Gaultheria, p. 102-3. † *Bot. Gaz.*, 1878, Vol. iii, No. 1, p. 37. ‡ *Ibid.*, No. 9, p. 79.

E.M. ad nat del.et pinxt.

ÌLEX VERTICILLÀTA, Gray.

GENUS.—**ILEX,*** LINN.

SEX. SYST.—HEXANDRIA MONOGYNIA.

PRINOS.

BLACK ALDER.

SYN.—ILEX VERTICILLATA, GRAY; PRINOS VERTICILLATUS, LINN.; P. GRONOVII, MICHX.; P. CONFERTUS, MŒN.

COM. NAMES.—BLACK ALDER, FEVER BUSH, WINTERBERRY, VIRGINIAN WINTERBERRY; (FR.) APALACHINE À FEUILLES DE PRUNIER; (GER.) VIRGINISCHE WINTERBEERE.

A TINCTURE OF THE BARK AND FRUIT OF ILEX VERTICILLATA, GRAY.

Description. — This upright or ascending, much-branched shrub, usually attains a growth of from 4 to 8 feet. *Leaves* thin and deciduous, not spiny, in form obovate, oval, or cuneate-lanceolate, acute at the apex and base, uncinately serrate, and downy upon the veins underneath; *petioles* about one-quarter the length of the blade. *Inflorescence* dicœcious; *flowers* all short peduncled, white, appearing with the leaves. *Sterile flowers* in small axillary umbels; *calyx-lobes* ciliate; *petals* mostly 4 to 6; *stamens* 6 to 7; *ovary* abortive. *Fertile flowers* aggregated or solitary; *petals* mostly 5 to 8; *ovary* conical, about 6-celled; *stigma* 4- to 6-lobed. *Fruit* a globose, bright vermilion berry, about the size of a large pea, crowded upon the branches so as to appear whorled; *nutlets* about 6, smooth and even, or dorsally furrowed or ridged. *Embryo* minute, nearly globose.

Aquifoliaceæ.—This small order, to which Prinos is but lightly wedded, and represented in North America by but 2 genera and 14 species, is characterized as follows: Shrubs or trees with their *leaves* simple, mostly alternate, and generally coriaceous and evergreen. *Flowers* small, axillary, 4- to 8-merous, white or greenish, often polygamous by abortion. *Calyx* minute, free from the ovary, 4- to 9-toothed. *Stamens* as many as the divisions of the corolla and alternate with them, the filaments attached to their very base; *anthers* adnate, opening lengthwise. *Corolla* hypogynous, rotate, or almost or quite 4- to 8-parted, imbricated in the bud. *Ovary* 4- to 8-celled; *ovules* anatropous; *stigmas* 4 to 8 or united into 1, nearly sessile. *Fruit* a baccate 4- to 8-seeded drupe; *seeds* solitary in each cell, suspended; *embryo* minute; *albumen* fleshy.

Our only other proven species in this order is the South American Maté, or Paraguay Tea (*Ilex Paraguayensis*, St. Hil.), the leaves of which are used like Chinese tea, and are considered slightly nervine, diaphoretic, and diuretic. In

* The ancient name of the holly oak.

general medicine the following species are more or less useful: The English Holly (*Ilex aquifolium*, Linn.), and the American co-species, *I. opaca*, Ait., have been considered nearly equal to Peruvian Bark in intermittent fevers and jaundice. The *Cassena* of the American aborigines, *I. Cassene*, Linn., and *I. Dahoon*, Walt., are emetic, and enter into the ceremonies of the natives as holy plants, which the males only were allowed to use as purifiers of the body. The Carthaginian *Myginda Uragoga*, Swartz., is said to be a most powerful diuretic. The juice and leaves of the Indian *Monetia Barleroides*, Linn., are considered by Hindoo doctors to be anti-catarrhal and anti-asthmatic; and the unripe fruit of the Brazilian *Ilex macoucoua*, Linn., are so rich in tannin as to be used as a substitute for galls.

History and Habitat.—The Black Alder is common in thickets at the margins of pools and marshy places, from western Florida northward; during its flowering season, in April and May, it is hardly distinguishable, to those who are not well acquainted with it, from the surrounding bush; but when the autumnal frosts have deprived all vegetation of its leaves, then the fruiting plant stands out like a flaming spot in the dreary waste, striking, even to the most careless observer, in its beauty.

This is another of the growing list of plants handed down to us by the aborigines, who used the bark both internally and externally as a tonic, astringent, and antiseptic, and is probably as well known to domestic practice as any indigenous shrub. In intermittent fever it has often proved as generally applicable as Peruvian Bark, and in such low typhoid forms associated with diarrhœa, and in later stages, where ulceration and hemorrhage are present, it is a very valuable agent. In general debilitated conditions of the system after long fevers, and where the body is depleted by exhausting discharges, it is also very useful, as well as in gangrenous affections and jaundice. Certain forms of chronic herpetic eruptions and ulcers are also benefited by its use as an external application. The berries are purgative and vermifuge, forming one of the pleasantest adjuvants in children's remedies, for the expulsion of lumbrici. Shoepf first noted the plant as having the above field of utility, and also mentioned its usefulness in anasarca.

The bark is officinal in the U. S. Ph.; in the Eclectic Dispensatory the preparation recommended is *Decoctum Prinos*.

PART USED AND PREPARATION.—The fresh bark and fruit, gathered before the first autumnal frost, are chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. The whole is then poured into a well-stoppered bottle, and allowed to stand eight days in a dark, cool place, being shaken thoroughly twice each day. After decanting, straining, and filtering, the resulting tincture has a greenish-brown color by transmitted light; an herbaceous odor; a bitter taste, and an acid reaction.

CHEMICAL CONSTITUENTS.—Beside a bitter principle, the nature of which has not yet been determined, this species contains about 4.8 per cent. tannin; a

resin soluble in alcohol, another insoluble in alcohol; coloring-matter; albumen; gum, and sugar.*

PHYSIOLOGICAL ACTION.—The berries caused nausea, vomiting, and purging, in two children who ate of them, but whom I had no further chance to watch. In a case reported† of the effects attending the ingestion of about twenty-five berries, the following symptoms supervened: Sensation of nausea in the stomach not amounting to real sickness nor interfering with the appetite; vomiting of bile without retching; profuse evacuation of the bowels, consisting of their natural contents, diluted with an immense quantity of greenish liquid, attended with no pain or uneasiness; another similar but less profuse evacuation followed in about half an hour, after which the patient felt remarkably well, but as though he had lost ten or twelve pounds in weight. Following this, his appetite and digestion seemed much better than usual.

DESCRIPTION OF PLATE 106.

1. End of a flowering branch, Binghamton, N. Y., May 5th, 1886.
2. Under side of leaf-margin.
3. Flower.
4. Calyx.
5. Stamen.
6. Pistil.
7. Fruiting branch.
8. Nutlet.

(2–6 and 8 enlarged.)

* Tilden analysis, *Jour. Mat. Med.*, vol. 1, N. S., 329.

† *Bost. Med. and Surg. Jour.*, 1833, 383.

Ĕm. ad nat del. et pinxt.

PLÀNTAGO MÀJOR, Linn.

GENUS.—**PLANTAGO,*** LINN.

SEX. SYST.—TETRANDRIA MONOGYNIA.

PLANTAGO.

PLANTAIN.

SYN.—PLANTAGO MAJOR, LINN.; PLANTA GOVULGARIS, GER.; *Αρνόγλωσσον*, **DIOSCOR.**

COM. NAMES.—PLANTAIN, BROAD-LEAVED PLANTAIN, RIB-GRASS, RIB-WORT, WAY-BREAD (WAY-BRED); (FR.) PLANTAIN ORDINAIRE; (GER.) GROSSER WEGETRITT.

A TINCTURE OF THE WHOLE FRESH PLANT, PLANTAGO MAJOR, L.

Description.—This cosmopolitan immigrant varies greatly in its growth, some individuals only attaining a height of 2 inches, others 18. *Root* perennial, fasciculate. *Leaves* all radical, broad, ovate, ovate-cordate or oblong, sometimes slightly toothed, 5 to 7-ribbed; *petioles* deeply channelled, smooth or slightly hairy. *Inflorescence* 1 to several long and slender, bracted, densely floral, sub-cylindrical spikes, each raised upon a naked scape; *flowers* all alike and perfect. *Sepals* 4, imbricated, persistent, membranaceous, and margined. *Corolla* whitish, thin, marcescent; *lobes* reflexed after flowering. *Stamens* 4, rarely 2, much exserted; *filaments* long filiform, lengthening suddenly when the anther is ripe; *anthers* 2-celled, early deciduous. *Pistil* dichogamous, *i.e.*, protruding from the flower tube before the anthers are ripe;† *ovary* 2-celled; *stigma* more or less unilateral, fringed. *Fruit* a 2 to 16-seeded pyxis, opening by a complete transverse fissure, the top falling off like a cap, and the thin partition escaping with the seeds; *seeds* somewhat fusiform; *albumen* sarcous; *embryo* straight, enclosed.

PLANTAGINACEÆ.—This small anomalous family of low acaulescent herbs is principally represented by the genus Plantago. Its members are characterized by having: *Leaves* all radical and ribbed. *Flowers* spiked upon a simple scape; *calyx* 4-cleft, persistent; *corolla* tubular or hypocrateriform, scarious and veinless. *Stamens* 4, inserted upon the tube of the corolla alternate with its lobes; *filaments* persistent, long and weak. *Ovary* 2-celled; *ovules* amphitropous; *style* single, long, and stigmatose. *Fruit* a membranaceous pyxis; *dehiscence* circumscissile; *seeds* 1 to several in each cell; *embryo* large, mostly straight; *albumen* sarcous.

The mucilaginous principle of the seeds of Plantago renders them somewhat valuable in medicine. The Indian plantain *Plantago Isphagula* (*P. decumbens*, Forsk) furnishes seeds from which a mucilaginous drink is prepared and used as an emollient; this species is mentioned in the native Materia Medica. The seeds of

---

* The ancient Latin name.

† A help in cross-fertilization.

the European and Barbarian *P. Psyllium*, the Hungarian *P. arenaria*, and the South European *P. Cynops*, are spoken of by Lindley as a good substitute for linseed and marsh-mallows. The leaves and roots of the common rib-grass *P. lanceolata* are considered expectorant and vulnerary; the Scottish Highlanders attach great value to this plant as a healing application to fresh wounds.

History and Habitat.—The common plantain grows in rich, moist soils, in Europe, India, and America, where it is considered truly indigenous north of Lake Superior. It flowers throughout the summer months, fruiting as it flowers. It is said that the American Indians gave this plant the name of "White Man's Foot," in allusion to its method of introduction, and its trait of accompanying the civilizer and literally growing in his footsteps. This character also gave rise to the vulgarism "way-bred."

The previous medical uses of plantain are chiefly those of a general vulnerary and demulcent; thus it became in great demand in the coughs attending various pulmonary and bronchial diseases as well as an application to recent wounds and chronic sores. The seeds were used in the former instance, the leaves in the latter. A decoction of the roots was recommended by Bergius in tertian intermittents, one ounce to four being taken when the chill came on. An infusion of the seeds in milk has been much used by the laity to check various hemorrhages from mucous surfaces, diarrhœa, dysentery, and leucorrhœa. The fibrous strings in the petioles have been extolled* as an almost certain cure for aching carious teeth, if placed in the ear on the affected side. It is said that these fibres turn black if the pain is relieved, but remain green if not. Boerhaave says that in his own experience he has found that plantain leaves placed upon the feet will ease the pain and fatigue engendered by long walks. Plantain has also been highly praised as an antidote to the effects of bites of venomous reptiles and insects; it is stated by Duncan† to be one of the principal ingredients in the remedy of the negro Cæsar, for the discovery of which he received a large reward from the Assembly of South Carolina. To complete this review of the uses of this herb no better expression could be used than that of Mérat:‡ "En fin, on a porté la racine des plantains en amulet pour guérir on prévenir une multitude des maladies."

PART USED AND PREPARATION.—The fresh plant, gathered when coming into flower, is chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp mixed thoroughly with one-tenth part of it, and the rest of the alcohol added. After having stirred the whole, pour it into a well-stoppered bottle, and let it stand eight days in a dark, cool place.

The tincture separated from this mass by filtration is opaque, in thin layers it has a deep reddish-brown color by transmitted light. It retains the peculiar odor of the plant, has a sourish astringent taste and an acid reaction.

CHEMICAL CONSTITUENTS.—*Mucilage.*—This substance exists plentifully in the seeds of all species, from which it may be extracted by water, and pre-

---

* Dr. Reutlinger to Dr. E. M. Hale, *New Rem.*, p. 500.

† *New Edinburgh Dispensatory.*

‡ *Dict. de M. Med.*, Supplement, 1846, p. 567.

cipitated from its watery solution (impure) by alcohol. Dry pure mucilage is a yellowish, tough, opaque body, swelling upon the addition of water, and finally dissolving into a ropy mass. The vegetable mucilages vary in their behavior toward reagents according to the plant from which they are extracted; they all, however, break down under the action of dilute sulphuric acid, first into gum, then sugar.

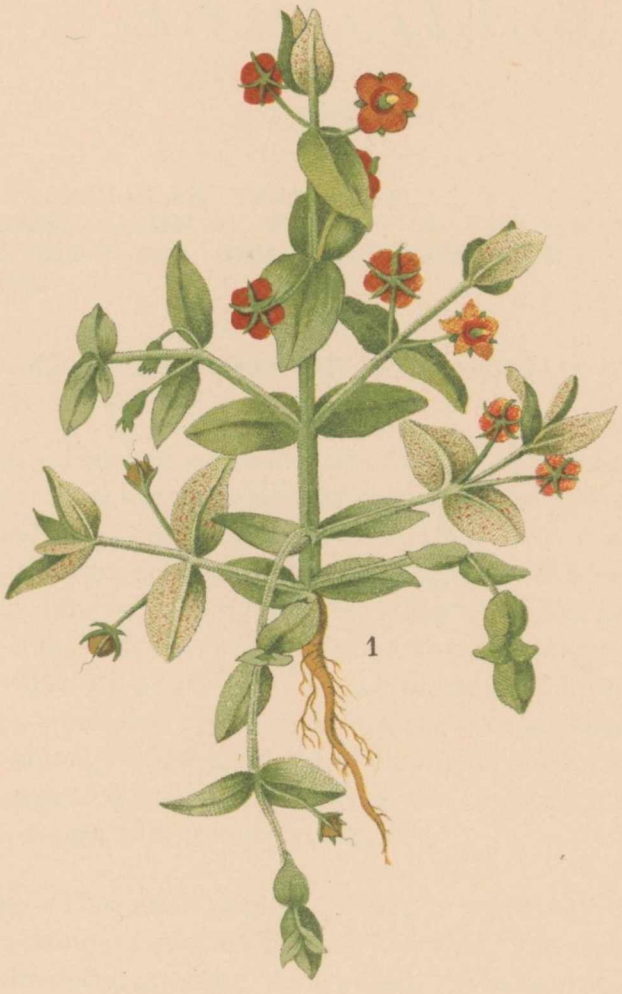
The whole plant has not been analyzed.

PHYSIOLOGICAL ACTION.—The principal symptoms caused by this drug are, according to Dr. F. Humphreys: headache; excessive digging, boring pain in carious teeth; severe dryness of the fauces and pharynx; colic; urging to urinate, with copious discharges; looseness of the bowels; weakness and oppression of the chest; restless sleep; and a strong fever, with a high pulse which finally becomes weak and intermittent.

DESCRIPTION OF PLATE 107.

1. Whole plant once reduced, Bergen, N. J., July 18th, 1879.
2. Flower.
3. Pistil.
4. Stamen.
5. Pollen, x 250.

(2–4 enlarged.)



Fm. ad nat. del. et pinxt.

ANAGÁLLIS ARVÉNSIS, Linn.

Tribe.—PRIMULEÆ.

GENUS.—**ANAGALLIS,*** TOURN.

SEX. SYST.—PENTANDRIA MONOGYNIA.

ANAGALLIS.

PIMPERNEL.

SYN.—ANAGALLIS ARVENSIS, LINN.
COM. NAMES.—COMMON SCARLET OR RED PIMPERNEL, POOR MAN'S WEATHER-GLASS, RED CHICKWEED; (GER.) HÜHNERDARN; (FR.) MOURON.

A TINCTURE OF THE WHOLE PLANT ANAGALLIS ARVENSIS, LINN.

Description.—This low, spreading or prostrate annual herb, grows from 6 to 20 inches in length. *Stem* square, glabrous, branching; *leaves* opposite, entire, ovate, and sessile, dotted upon the under surface. *Inflorescence* axillary; *flowers* ranging on different plants from scarlet to white through the shades of blue and purple; *peduncles* filiform, longer than the leaves, 1-flowered, bractless. *Calyx* 5-parted; *lobes* lanceolate-subulate; *margins* rough. *Corolla* rotate, 5-parted, longer than the calyx; *tube* little or none; *lobes* broad, obovate, obtuse, fringed with stipitate glands. *Stamens* 5, inserted upon the base of the corolla; *filaments* purple, bearded; *anthers* broadly oblong. *Ovary* free from the calyx; *ovules* amphitropous. *Fruit* a globular, membranaceous, circumcissile capsule or pyxis; *seeds* many, somewhat triangular; *testa* rough with minute veruccæ.

Primulaceæ.—This small family of herbs is represented in North America by 12 genera, comprising 38 species and 15 varieties; it is characterized as follows: *Leaves* simple, alternate, opposite, or whorled. *Flowers* regular, symmetrical, and perfect; *perianth* hypogynous. *Calyx* persistent. *Corolla* rotate, hypocrateriform, or campanulate. *Stamens* of the same number as the lobes of the corolla and opposite them; *filaments* inserted upon the tube of the corolla; *anthers* introrse. *Ovary* 1-celled, free from the calyx; *style* columnar, undivided; *stigma* undivided; *ovules* sessile on a free central placenta. *Seeds* numerous; *albumen* copious, fleshy; *embryo* straight, small.

The only other plant of this order in our Materia Medica is the European Sow-Bread (*Cyclamen Europæum*, Linn.). In general and household practice the flowers of the European Cowslip (*Primula officinalis*, Jacq.) have been used as a sedative, and placed in wine to render it soporific.

---

* Ἀνάγελάω, *anagelao*, to laugh; from its supposed quality of causing hilariousness.

History and Habitat.—The Pimpernel is naturalized in this country from Europe, and has established itself along both the Atlantic and Pacific coasts in dry, sandy soil, where it blossoms from June to August.

Anagallis formerly held a place in the pharmacopœias of Great Britain as a detergent, vulnerary, and cephalic; and was much prized by the ancients in gout, gravel, convulsions, and the plague. Gelin and many others considered it highly anti-hydrophobic, and reported many cures of this dire malady by its use, even after dangerous symptoms supervened. The plant also enjoyed much reputation at one time as an anti-epileptic, sudorific, and diuretic in dropsy; it has, however, entirely passed out of the minds of general practitioners. Pliny and Dioscorides thought highly of the Pimpernel in the removal of intestinal and hepatic obstructions; and it was, most probably, from the happier condition of the mind following such action, that the latter called the plant *ἀνάγελάω*.

PART USED AND PREPARATION.—The whole fresh, flowering plant (the scarlet-flowered form) is chopped and pounded to a pulp, enclosed in a piece of new linen, and subjected to pressure. The expressed juice is then briskly agitated with an equal weight of alcohol, and allowed to stand eight days in a dark, cool place. The tincture, prepared by filtering the above mass, has a slight olivaceous color by transmitted light; a sweetish somewhat nauseous herbaceous odor; a nutty and slightly astringent taste; and an acid reaction.

CHEMICAL CONSTITUENTS.—*Cyclamin*, $C_{20}H_{24}O_{13}$. This glucoside forms in small white crystals, or in an amorphous, lustreless, friable mass; it is very acrid, has a rancid taste, and a neutral reaction. Cyclamin is not volatile, is soluble in water and alcohol, but not in ether. Its aqueous solution is quite saponaceous. This glucoside breaks down under the action of mineral acids as follows:

$$\underset{\text{Cyclamin.}}{C_{20}H_{24}O_{13}} = \underset{\text{Glucose.}}{C_6H_{12}O_6} + \underset{\text{Cyclamiretin.}}{C_{14}H_{10}O_6} + \underset{\text{Water.}}{H_2O}.$$

PHYSIOLOGICAL ACTION.—The whole plant is acrid and poisonous, as the following experiment of Orfila shows:

"At eight o'clock in the morning, three drachms of the extract of pimpernel, dissolved in an ounce and a half of water, were introduced into the stomach of a robust dog. At half-past twelve he had a motion. At six in the evening he was dejected. At eleven sensibility appeared diminished. The next morning at six he was lying upon the side, and appeared to be dead; he might be displaced like an inert mass of matter. He expired half an hour later. The mucous membrane of the stomach was slightly inflamed; the interior of the rectum was of a bright color; the ventricles of the heart were distended with black coagulated blood; the lungs presented several livid spots, and their texture was preternaturally dense. Two drachms of the same extract, applied to the cellular texture of a dog's thigh, produced death in twelve hours; and the heart and lungs presented the same appearances as in the other." The following symptoms, recorded by Schreter, show the character of its action upon man: Lively mood with extra mental vigor;

stitching headache with sticking pains in the eyeballs; dryness of the throat; tickling, prickling along the urethra, causing desire for coition; prickling in the chest; general drawing rheumatic pains; sleeplessness; trembling and shivering; and trembling of the heart.

DESCRIPTION OF PLATE 108.

1. Whole plant, Salem, Mass., July 25th, 1875.
2. Fruit.
3. Same, showing dehiscence.
4. Seed.

(2–4 enlarged.)

F M. ad nat. del. et pinxt.

CATÁLPA BIGNONIOÍDES, Walt.

GENUS.—**CATALPA,*** LINN.

SEX. SYST.—DIANDRIA MONOGYNIA.

CATALPA.

INDIAN BEAN.

SYN.—CATALPA BIGNONIOIDES, WALT.; BIGNONIA CATALPA, LINN; CATALPA SYRINGÆFOLIA, SIMS; CATALPA CORDIFOLIA, DUHAM.

COM. NAMES.—CATALPA, INDIAN BEAN, BEANTREE.

A TINCTURE OF EQUAL PARTS OF THE FRESH INNER BARK AND LEAVES OF CATALPA BIGNONIOIDES, WALT.

Description.—This magnificent umbrageous tree, beautiful in blossom, picturesque in fruit, attains a height of from 20 to 40 feet, its short trunk and spreading branches making it one of our finest shade trees, noted for the persistence of its fruit, the pods often hanging until new ones are formed. The *stem* is deliquescent, and has a fine gray corrugated bark, more or less glossy and warty; the *wood* commercially has but little value, though it is light, fine-textured, and capable of taking a fine polish. The *branches* are large and very irregular in their mode of growth. *Leaves* large, opposite or in whorls of three, long-petioled, simple, entire, heart-shaped and pointed; they are smooth above and downy beneath, especially upon the midrib. *Inflorescence* open, compound, showy panicles, of large, striking flowers, upon the ends of the branches. *Calyx* deeply 2-lipped or 2-parted, the segments being ovate, scaphoid, and blunt-pointed. *Corolla* monopetalous, campanulate, inflated, deciduous; the repand five-lobed, divergent border, irregular and 2-lipped. *Stamens* sometimes didynamous with a rudimentary fifth, but more frequently with only one fertile pair; *filaments* incurved, as long as the tube of the corolla and inserted upon it; *anthers* with two diverging cells; *pollen*-grains compounded of many globular bodies all united in the form of a globe. *Pistil* compound; *ovary* 2-celled, free, upon a fleshy discoid base; *style* single; *stigma* capitate, or consisting of two lips or plates. *Fruit* a woody, subcylindrical, slender pod, from 4 to 12 inches long, pendulous and persistent, 2-celled, the septum contrary to the valves; *seeds* numerous, densely packed and superimposed, flattened by compression, membraneous, with fringe-tipped alæ; *embryo* flat, *albumen* none.

History and Habitat.—Catalpa, like all the other genera of this order of plants, is tropical; its most northern range is Kentucky, where it grows in many places spontaneously, flowering in July, and fruiting in October. It is cultivated in many places in the Middle and Eastern States, attaining a full growth and ap-

* The Indian name.

parently as healthy and perfect as in its own climate. Its uses as a drug have been but slight, its provings as yet show nothing of great importance, a mild cathartic action being the only result of large doses of a decoction of the inner bark. It has been used as an anthelmintic. Catalpa has no place in the U. S. Ph., nor Eclectic Materia Medica.

PART USED AND PREPARATION.—The fresh inner bark and leaves are chopped and pounded to a pulp and weighed. Then two parts by weight of alcohol are taken, the pulp thoroughly mixed with one-sixth part of it, and the rest of the alcohol added. After stirring the whole well, and pouring it into a well-stoppered bottle, it is allowed to stand eight days in a dark, cool place. The tincture is then separated by decanting, straining and filtering. Thus prepared, it has a clear orange-brown color by transmitted light, a bitter astringent taste and an acid reaction.

CHEMICAL CONSTITUENTS.—The bark of this plant contains an amorphous bitter principle, the chemistry of which has not been determined; it has a nauseous taste, and is soluble in alcohol. Beside this, sugar and tannin are present in small amount. The plant seems to impart all its properties to hot water and to alcohol.

PHYSIOLOGICAL ACTION.—Unknown. It has been said that it is dangerous to long inhale the odor of the tree, which however is false, at least in this locality the emanations cause no symptoms whatever.

DESCRIPTION OF PLATE 109.

1. Panicle from a specimen in DeWitt Park, Ithaca, N. Y., June 12, 1880.
2. Medium-sized leaf.
3. Pistil (enlarged).
4. Stamens (enlarged).
5. Medium-sized fruit.
6. Seed.
7. Pollen x 380.