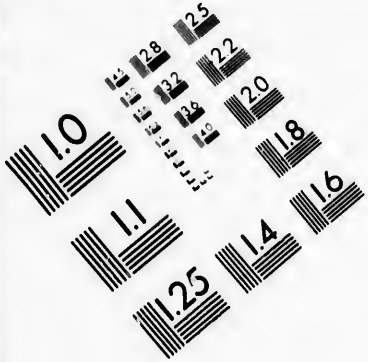


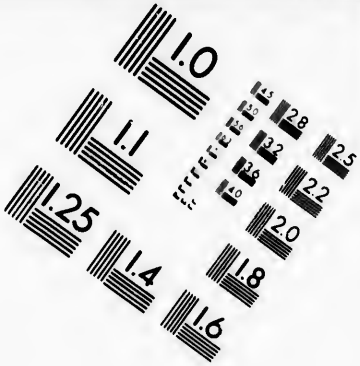


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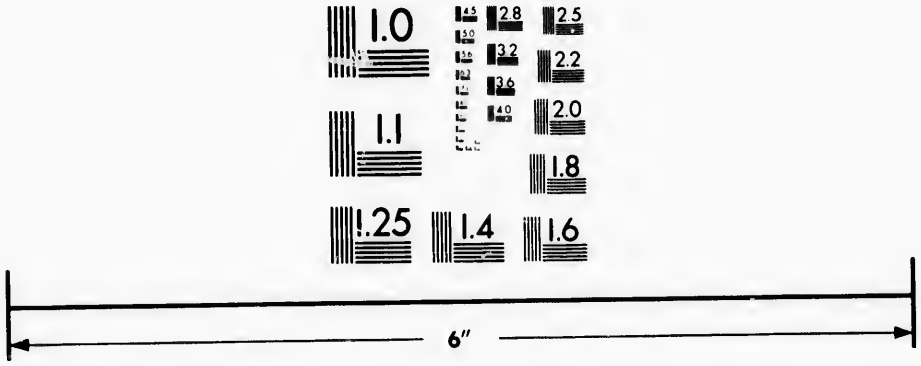


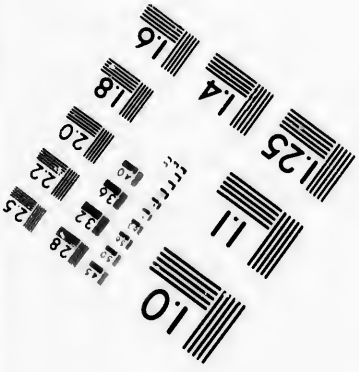


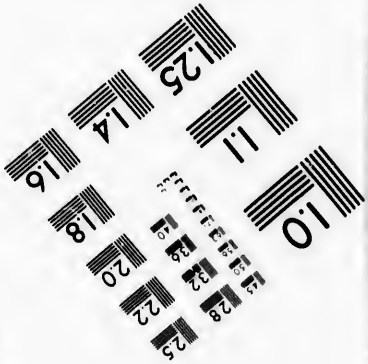


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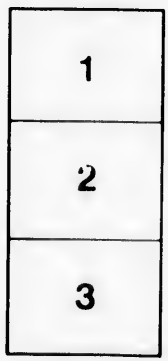


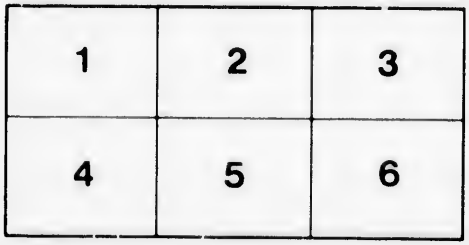


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32X

WAGENER APPLE TREE (6 YEARS OLD), NEAR PAONIA, WESTERN COLORADO. (IRRIGATED.)

NONIRRIGATED ORCHARD OF APPLE AND PEAR TREES (4 YEARS OLD), NEAR LITTLETON, EASTERN COLORADO.

FIG. 1. PINEAPPLE PLANT WITH FRUIT.

FIG. 2. PINEAPPLE FIELD, ELLIOTTS KEY.

FIG. 1.—STRAWBERRY FIELD NEAR LAWTEY, FLA.

FIG. 2.—STRAWBERRY FIELD NEAR CHARLESTON, S. C.

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# North American Sylva;

OR, A DESCRIPTION OF THE

## FOREST TREES

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## UNITED STATES, CANADA, AND NOVA SCOTIA,

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## F. ANDREW MICHAUX,

AND CONTAINING ALL THE

FOREST TREES DISCOVERED IN THE ROCKY MOUNTAINS, THE TERRITORY OF OREGON, DOWN TO THE SHORES OF THE PACIFIC, AND INTO THE CONFINES OF CALIFORNIA, AS WELL AS IN VARIOUS PARTS OF THE UNITED STATES.

ILLUSTRATED BY 121 COLORED PLATES.

BY

THOMAS NUTTALL, F.L.S.

MEMBER OF THE AMERICAN PHILOSOPHICAL SOCIETY, AND OF THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA, ETC. ETC. ETC

THREE VOLUMES IN TWO.

VOL. II.

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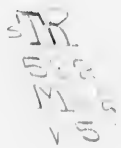

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THE

# NORTH AMERICAN SYLVA.

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## EXCÆCARIA.*

*Natural Order*, EUPHORBIACEÆ. *Linnæan Classification*, DIŒCIA, MONADELPHIA.

DIŒCIOUS or MONŒCIOUS.—*Male* flowers in cylindric aments, solitary, or by threes, subtended by single scales; the filament of the *stamens* 3-parted at the summit. *Female* flowers solitary or in spikes, with a calyx of scales. *Capsule* tricoccous.

§ GYMNANTHES. (*Gymnanthes*, genus. SWARTZ.)—MONŒCIOUS. *Female* flowers solitary, pedicellate, the pedicel articulated and terminated by a minute toothed calyx, its base surrounded by embracing scales. *Male* flowers by threes.—Trees of Tropical America, with alternate, entire, sempervirent leaves.

---

* From *excæcare*, to blind,—the juice of the plant being so acrid as to cause blindness.

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# SHINING-LEAVED POISON-WOOD.

Excæcaria lucida. *Floribus femineis subsolitariis pedicellatis; masculis tripartitis spicatis; foliis cuneato-ellipticis, lanceolatisve subserratis.*

Excæcaria lucida. *Monoica, floribus pedicellatis, staminibus trichotomis, femineis pedunculatis, foliis ellipticis subserratis.* — Swartz, Prod., p. 1122.

*Ricini fructu glabro, arbor julifera, lactescens, folio myrtino.*—Sloane, Catal. Hist., vol. ii. p. 131, tab. 158, fig. 2.

According to Dr. Blodgett, this plant, in Key West, becomes a tree of thirty to forty feet in height. It is also indigenous to Jamaica and Cuba, and a broad-leaved variety was collected by Poiteau in St. Domingo. The wood is yellowish white, hard, and close-grained; but of its uses, or the economy of the plant, we are as yet ignorant.

The branches are covered with a gray and somewhat rough bark. The leaves are alternate, shortly petiolate, smooth and shining on the upper surface, and on both sides rather prominently and elegantly veined and reticulated; they are slightly and distantly serrulated, often lanceolate, and somewhat obtuse. On other branches the leaves are almost obtong-elliptic, and narrowed or wedge-formed at the base. In the rainy season, toward the extremities of the twigs come out close, brown, cylindric, axillary aments, which at length shoot into loose spikes or aments covered with numerous male flowers, growing by threes together on a common pedicel, which divides above into the three flowers, each subtended (apparently?) by a still smaller scale, and consisting of a secondary, short stipe, divided into three stamens. The anthers are round, small, and two-celled. At the base of the catkin, or below in a separate axil, issue the pediccllated female flowers, subtended at the base by appropriate scales, and with the rudiments of a calyx beneath

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Exæcaria lucida

*Shining leaved Poison Wood* *Agallocha nitens*

the germ. The stigmas are three, rather thick, and reflected. The fruit is tricoccous, supported upon an elongated pedicel, and rather large. The tree, like most of the family of the Euphorbiaceæ, is filled with a caustic, milky juice.

According to Rumphius, the juice of the *Excæcaria Agallocha*, and even its smoke when burnt, affects the eyes with great pain, as has been sometimes experienced by sailors, in cutting the wood for fuel, who, having accidentally rubbed their eyes with the juice, became blinded for a time, and some of them finally lost their sight. The Agallocha wood, formerly so much esteemed, remarkable for its fragrant odor and inflammability, belongs to the genus *Aquilaria*, and has no relation with this family of plants.

PLATE LXI.

*A branch of the natural size. a. The male flower. b. The female flower.*

# TALLOW TREE.

*Natural Order*, Euphorbiaceæ, (Jussieu.) *Linnæan Classification*, Monœcia, Monadelphia.

STILLINGIA.* (Linn.)

Monœcious.—*Staminiferous* flowers solitary, or many and small, with an entire hemispherical involucrum. *Perianth* tubular, widened and ciliated on the border. *Stamens* two or three, exserted, with the filaments slightly united at the base. *Fertile* flowers solitary, involucrate; perianth as in the male. *Style* with three stigmas. *Capsule* 3-lobed, 3-grained, surrounded by the enlarging involucrum. *Seeds* three.

Arborescent, shrubby, or herbaceous plants, with a milky sap. Leaves alternate, entire or serrulated, having stipules. Flowers in spikes, the spikes solitary, lateral, or terminal, the upper part staminiferous.

---

# TALLOW TREE.

Stillingia sebifera. *Arborea; foliis petiolatis, rhombeis acuminatis integerrimis, infra basin glandula petiolari, floribus masculis numerosis.*—Willd., Sp. pl., iv. p. 588. Mich., Flor., ii. p. 213. Pursh, ii. p. 608. Elliott, Sk., ii. p. 651.

Croton *sebiferum.*—Linn., Sp. pl., l. c.

*Ricinus Chinensis sebifera, populi nigræ folio.*—Petiver, Gazoph., 53, tab. 34, fig. 3. Plukenet, Amalth., 76, tab. 390, fig. 2.

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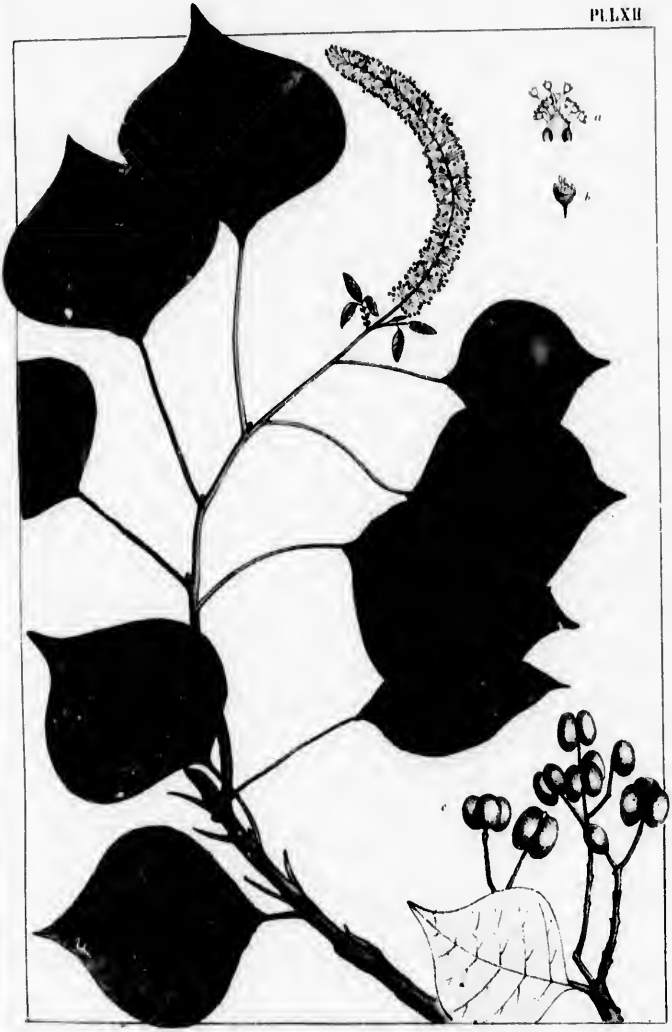
* So named in honor of Dr. Stillingfleet, an English botanist.




Stillingia sebifera.

*Tallow tree* *Stillingier port suif.*

The Tallow Tree grows to the height of twenty to forty feet, and so nearly resembles the Black Poplar in its foliage that it might be mistaken for it if the leaves were serrated. It is indigenous to China, where it grows on the borders of streams. It is now naturalized in both Indies, in the South of Europe, and in the southern part of the United States, along the sea-coast. It resembles a Cherry Tree in its trunk and branches. The bark is of a whitish gray, and soft to the touch. The branches are long, smooth, and flexible, ornamented with leaves from their middle to their extremities, where they grow in a kind of tuft. These leaves are oval-rhomboidal, on longish petioles, wider than long, very entire, acuminated, green, and smooth on both sides, furnished at their base with two very small sessile glands: before falling, at the approach of winter, they become red. The stipules are membranous and linear-lanceolate. The flowers are terminal, disposed in erect spikes, resembling catkins, which are about two inches long. The male flowers are numerous, very small, and pedicellated, with a very short monophyllous and almost-truncated calyx; with two, three, and sometimes more stamens having exserted filaments. The fertile flowers are in small numbers at the base of each spike. The capsules are smooth, brown, and oval, three-lobed, divided internally into three bivalvular cells. Each cell contains a somewhat hemispherical seed, internally flattened and grooved, externally convex and rounded, covered with a somewhat firm, white, sebaceous or fatty substance. The seeds remain firmly attached above by three threads, which traverse the fruit, and thus remain suspended after the fall of the valves of the capsule, so that the tree seems to be covered with clusters of white berries, which, contrasted with the red color of the fading leaves, produce a very peculiar and elegant appearance.

The Tallow Tree, as its name implies, furnishes the Chinese with a material for candles; they extract besides from its seeds oil for their lamps. The ordinary method employed in sepa-

rating the tallow from the fruit, is by bruising together the capsules and seeds, afterward boiling the mass in water, and skimming off the oil that arises to the surface, which, when cold, becomes condensed like tallow. To every six pounds of this fat is sometimes put three pounds of linseed-oil, with a little wax to give it a more solid consistence. The candles thus obtained are of an extreme whiteness, but are also made red by the addition of vermilion. It is said that the Chinese steep these candles in a sort of wax, also the produce of a tree, which forms a crust around the tallow that hinders them from melting.

In the Southern States, though the trees produce an abundance of perfect fruit, no use is yet made of it.

PLATE LXII.

*A branch of the natural size. a. A cluster of male flowers. b. A single male flower. c. The seeds or nuts coated with wax.*

---

# PRIVET-LEAVED STILLINGIA.

STILLINGIA LIGUSTRINA. *Foliis lanceolatis utrinque attenuatis integerrimis petiolatis, floscalis masculis subsolitariis, triandris.*

STILLINGIA *ligustrina*.—MICH., Flor. Bor. Am., vol. ii. p. 132. WILLD., Sp. pl., iv. p. 566. PURSH, vol. ii. p. 608. NUTT., vol. ii. p. 226. ELLIOTT, vol. ii. p. 651.

THIS native species of the genus Stillingia, in the forests of East Florida, according to the observations of my friend Mr. Ware, becomes a tree, and attains an elevation of thirty feet. In Georgia, at Columbus, on the banks of the Chattahoochee, where I have observed it in considerable abundance, it only forms a shrub of ten or twelve feet. Although a handsome tree

or shrub, nearly evergreen, and resembling the Privet when in flower, so far from being pleasing, it emits a very disagreeable odor, almost as fetid as carrion.

The bark is nearly smooth, and brownish gray, the branches diffuse, and only clad with leaves toward the summits; these are from one to two inches in length and about three-quarters of an inch in width; they are either wholly lanceolate or oval-lanceolate, very smooth, entire, and acute or acuminated at either extremity: the petioles are about two or three lines long. The flowers are small, greenish yellow, in lateral and terminal shortish spikes; in some specimens wholly stamin'ferous, in others with a few fertile flowers at the base of the spikes. Scale or bracte of the sterile flowers short-ovate, mostly one-flowered. Perianth three-cleft; stamens generally three, the filaments very short. Fertile flower similar. Styles three, united at base, reflected; stigmas simple. Capsule three-seeded.

# DRYPETES.

(Vahl.)

---

*Natural Order*, Euphorbiaceæ? (Juss.) *Linnæan Classification*, Dœcia, Tetrandria to Octandria.

Diœcious.—Male with the calyx 4 to 6-leaved, and unequal. *Corolla* none. *Stamina* four to eight, exserted. *Disk* central, villous.—Female with the flower as in the male. *Ovary* free, subovate, villous, 2-celled, or by abortion 1-celled; ovules two in each cell, pendulous. *Styles* two, or by abortion one, short; stigmas capitate, villous. *Drupe* subovate, villous, dry, 1-celled, 1-seeded, rarely 2-celled, 2-seeded. *Seed* filling up the cell of the fruit; albumen large and fleshy; embryo large, inverted, straight; cotyledons foliaceous.

Trees of the tropical parts of America, with alternate, nearly exstipulate leaves, and axillary clusters of small herbaceous flowers.

---

## SMALL-FLOWERED DRYPETES.

Drypetes crocea. *Foliis oblongo-lanceolatis acuminatis integerrimis nitidis, flore masculo* 4–6-*andro, femineo distylo.*

Drypetes crocea. *Foliis oblongis, integerrimis, nitidis, flore masculo* 4–5-*andro, femineo distylo.*—Poiteau, Annales du Museum Hist. Nat., (3d series,) vol. i. p. 159, t. 8.

Schleffera lateriflora. *Floribus lateralibus apetalis.*—Swartz, Flor. Ind. Occid., vol. i. p. 329.

This plant, at Key West, in East Florida, (according to Dr. Blodgett,) becomes a large tree. The wood appears to be whitish

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Drypetes crocea

*Small Flowered Drypetes* — *Drypetes Sativina*

and close-grained, and that of *D. alba* is very hard, and much esteemed by carpenters. At St. Domingo, Poiteau remarked that it generally seemed to prefer the protecting shade of other large trees with which it grew. It appears to be a very elegant evergreen; the twigs exuding a slightly-aromatic resin, in small quantities, which, spreading over the petiole and midrib of the leaves, communicates, at times, a white or glaucous hue. The leaf, to the taste, is slightly bitter and astringent, with some aroma arising from the resin it possesses; and it has so much the flavor of tea as almost to promise a succedaneum for that favorite beverage.

The bark is of a light gray and warty. The leaves are from three to three and a half inches long, and from one to one and a half wide, entire or slightly repand, attenuated into a short petiole, of a coriaceous consistence. The surface is delicately and lightly reticulated as in the leaf of the Bay, (*Laurus.*) The flowers are small and numerous, in axillary roundish clusters; these in the male consist of a brownish-green calyx of four small ovate divisions, pubescent on the margin, containing four to six short stamens. The calyx of the female contains a germ with two short styles and capitate stigmas; there are two ovules in each cell; the drupe is villous, and when ripe is of the color of saffron, containing but a single seed. The perisperm has the hot and acrid taste of strong mustard, but is, notwithstanding, the particular food of a small beetle.

## PLATE LXIII.

*A branch of the natural size. a. The male flower. b. The female flower. c. The fruit.*

# GLAUCOUS DRYPETES.

DRYPETES GLAUCA. *Foliis ovato-oblongis, aliis obtusiusculis, remotè crenulatis, aliis longioribus, integerrimis, acuminatis; floribus 6–8-andris.*—VAHL., Eclog. Am., fascic. ii. p. 49.

THIS species also becomes a tree, and grows at Key West with the preceding; it is likewise indigenous to Montserrat and Porto Rico. The branches are cylindric, somewhat angular above, with the buds thinly covered with a brownish down. The leaves are very similar to those of the preceding species, and often glaucous, with a thin, resinous coating. The male flowers are 4 to 5-leaved, with six to eight stamens; there is no corolla. The drupe is oval, villous, becoming the size of a small hazel-nut, with a suture on one side, and terminated, when young, with a single, sessile, reniform stigma.

The wood is probably of the same quality as in the preceding species.

# HORSE-CHESTNUT.

(Marronier d'In Fr.)

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*Natural Order*, Hippocastaneæ, (Decand.) *Linnæan Classification*, Heptandria, Monogynia.

## ÆSCULUS.* (Linn.)

*Calyx* tubular-campanulate, 5-toothed. *Petals* four or five, more or less unequal, unguiculate. *Stamens* six to eight, (often seven,) with separate filaments. *Ovary* roundish, 3-celled, with two collateral ovules in each cell. *Fruit* subglobose, coriaceous, even or echinate, 1 to 3-celled. *Seeds* solitary, large, with a broad hilum, and no albumen. *Cotyledons* subterraneous.

Trees or shrubs of North America and Temperate Asia, with opposite, digitate, serrated leaves. Flowers conspicuous, in terminal panicles on articulated pedicels.

§ 3. *Fruit unarmed, leaves stipulate, the tube of the calyx at length cleft.*

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* The Latin name of a tree which furnished an esculent nut.

# CALIFORNIAN HORSE-CHESTNUT.

ÆSCULUS CALIFORNICA. *Staminibus corollæ longioribus, petalis* 4, *sub æqualibus, calycibus tubuloso-campanulatis inæquali-dentatis; thyrsus abbreviatis densifloris; petiolis marginatis, foliolis quinque ovato-lanceolatis subellipticis acutis serrulatis glabris glaucescentibus, basi rotundatis subcordatis.*—NUTT., in TORR. and GRAY, Flor. N. Am., vol. i. p. 251.

CALOTHYRSUS *Californica.*—SPACH, in Ann. Sc. Nat., (ser. ii,) p. 62.

THIS is the only species hitherto discovered of this ornamental genus on the western side of the American continent; and it differs from the ordinary type quite sufficiently to constitute a separate section.

I observed it very sparingly on the border of a small stream in the immediate vicinity of Monterey, in Upper California, flowering in the month of March, with the usual precocious habit of the genus. It appears also to have been observed in some part of California by Botta, according to Spach.

It forms a low, spreading, bushy tree, about fifteen to twenty feet high, with clusters of spreading branches issuing from near the root, so as to form a sort of thicket. The trunk is smooth and gray, only a few inches in diameter, and the wood very similar to that of other species of the genus.

The leaves, usually in fives, have broad and flat marginated petioles, terminating usually in two long, linear, conspicuous, and somewhat membranaceous stipules; the whole cluster of leaves is also subtended by several broad stipules, which appear to be the innermost series of bud-scales, but they are quite persistent, and frequently terminated by rudiments of leaves; the inner leaves of the flowering branches are often in threes or fours. The leaflets, three to four inches long, are supported upon long and slender petioles; beneath they are pale and somewhat glaucous, everywhere smooth, finely and obtusely serrulated, and

Æsculus Californica.

*Californian Horse Chestnut.* *Marronnier de Californie.*

acute at the points; below they are rounded and sometimes sinuated. The flowers are of a pale rose color without a mixture of any other color, and produced in a crowded, compound spike or thyrsus. The calyx is somewhat whitely villous, indistinctly five-toothed, and at length cleft down nearly to the base on the lower side. The petals appear connivent, with the claws shorter than the calyx, scarcely at all spreading, and are generally in fours. Stamens five or six. I have not seen the fruit, but the germ is 2 or 3-celled, and villous.

PLATE LXIV.

*A branch of the natural size. a. The germ.*

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In the Herbarium of the Academy of Natural Sciences in Philadelphia, is a specimen collected in Nepaul by Dr. Wallich, named *Æsculus Indica*, which bears no inconsiderable resemblance to the present species. It has the same perfectly-smooth leaflets, seven in number, oblong-lanceolate, serrulate, and acuminate, without stipular scales. The thyrsus is very large, compound, and showy, with a villous irregularly-toothed calyx, often anteriorly cleft, as in the preceding species. The petals appear to have been white, four in number, the two inner much narrower, with a fading red spot in the centre of each. The stamens are five to seven, and much exserted; the fruit, without spines, is therefore a *Pavia*. I find no description or allusion to this magnificent species, which well deserves a place in gardens, and is probably hardy.

In passing, I must remark that no two species of the genus are more perfectly distinct from each other than the *Æ. Ohioensis* of Decandolle and Michaux, (Pavia of the latter,) and the *Æ. glabra*. The *Ohioensis* becomes a lofty tree, with five or more

remarkably long leaflets, (seven to nine inches long,) acuminated at each end, and beneath more or less pubescent, at least along the ribs. The flowers are also white and showy, not green or yellowish green, and inconspicuous as in the constantly dwarf plant known as *Æ. glabra*.

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Long-spiked Pavia (*Æsculus macrostachya*, Mich.) This elegant and very distinct Pavia grows abundantly in all the lower parts of Alabama and West Florida. The fruit, like all the rest of the genus, is inedible and bitter, and, in place of food, affords a pretty good fish-poison. The feecula of the seeds of all the species can be manufactured into starch.

Sapindus Marginatus

*Florida Soap Berry* *Savonnier de la Floride*

# SOAP-BERRY TREE.

(Savonnier, Fr.)

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*Natural Order*, Sapindace.e. (Jussieu.) *Linnæan Classification*, Octandria, Trigynia.

SAPINDUS. (Linn.)

*Sepals* (or calyx leaves) four to five. *Petals* four or five, glandular or bearded within, or with a lateral filament at the summit of the claw. *Stamens* eight to ten, with the filaments villous. *Styles* combined, stigmas three. *Carpels* three, globose, fleshy, connate, two of them in general abortive. *Seed* large and spherical, one in each carpel, (or small capsule.)

The plants of this genus are small trees, with the present exceptions, and one of doubtful character in Japan, all inhabitants of the tropical climates of America and India. The leaves are without stipules, abruptly pinnate, or unequally pinnate by the abortion of the last pair of leaflets. The flowers are small and whitish, very numerous, disposed in racemes or panicles. The pulp of the berries in all the species is saponaceous. (The name is a contraction of *Sapo Indicus*, or Indian soap.)

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## FLORIDA SOAP-BERRY.

Sapindus marginatus. *Rachi superne angusto marginata, foliolis glabris inæquilateralis lanceolatis subfalcatis acuminatis 5–6-jugis, paniculis compositis terminalibus, petalis inappendiculatis.*

Sapindus *marginatus*.—Willd., Enumer., p. 432. Decand., Prod., vol. i. p. 607. Torrey and Gray, vol. i. p. 255.

Sapindus *saponaria*.—Lamarck's Illust., tab. 307. Mich., Flor. Bor. Am., i. p. 242. Pursh., Flor., vol. i. p. 274. Nutt., Gen. Am., i. p. 257. Elliott's Sketches, Bot., vol. i. p. 460. *S. inæqualis*.—Decand., vol. i. p. 608.

This elegant tree, exclusively indigenous to the United States, is found along the coast of Georgia and Florida, and in the interior as far as Arkansas. It varies in height from twenty to thirty feet and sometimes even to forty feet. Branches erect and smooth; the leaves smooth and shining, composed of four to nine pair of alternate, lanceolate, acuminate, subfalcate leaflets. Panicles of flowers large, dense, terminal, and axillary.

Berries about the size of a cherry, with a saponaceous pulp, usually only one of the three carpels fertile.

The *S. saponaria* of the West Indies, to which this species is allied, has long been in use by the natives for the purposes of soap. The fleshy covering of the seed, and also the root in some measure, makes an excellent lather in water, but, if used too frequently and of too great strength, is apt to burn and injure the texture of the cloth.

The round black seeds were at one time largely imported into England, for the purpose of making buttons for waistcoats, being durable and not apt to break.

At present they are used in the West Indies for various ornamental purposes, being tipped with silver or gold, and strung for beads, crosses, &c. It is also used as a medicine, and, pounded and thrown into water, has the singular property of intoxicating and killing the fish which may be there.

The wood is soft, and not very durable.

## PLATE LXV.

*Represents a branch of the natural size. a. A panicle of flowers.*

Melicocca Paniculata.

*Round fronted honeyberry.* *Kneper l'anicule.*

# MELICOCCA.* (Browne, Linn.)

(Knepier, Fr.)

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*Natural Order*, Sapindaceæ. *Linnæan Classification*, Octandria, Monogynia.

Flowers polygamous.—*Calyx* 4 to 5-parted, persistent. *Petals*, the same number, with the divisions of the calyx inserted into a hypogynous disk. *Stamens* often eight. *Ovary* superior, mostly 3-celled. *Style* one, the stigma capitate or 3-lobed. *Drupe* coated, mostly 1-celled, 1-seeded. *Seed* attached to the axis of the cell.

Trees or shrubs, mostly of Tropical America, with equally-pinnated, alternate leaves, usually in two to three pairs, and entire. The flowers small, disposed in axillary or terminal spikes or panicles; the fruit with a succulent pulp.

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## ROUND-FRUITED HONEY-BERRY,

or

## GENIP TREE.

Melicocca paniculata. *Foliis pinnatis, 2–3-jugis, foliolis oblongo-lanceolatis integris, floribus paniculatis subcorymbosis laxis, 5-petalis drupis sphæricis.*

Melicocca *paniculata*.—Juss., Mem. Mus. Hist. Nat., vol. iii. p. 187, t. 5. Decand., Prod., vol. i. p. 615.

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* From μελι, *honey*, and κοκκος, *a berry*, in allusion to the sweetness of the fruit.

This species, nearly allied to the common Honey-Berry of the West Indies, (*M. bijuga*,) was discovered in St. Domingo by M. Poiteau, and of which a very excellent figure is given by Jussieu, in the "Memoirs of the Museum of Natural History." Dr. Blodgett has also met with it on Key West, where it becomes a large tree. Of the nature of the wood we are not informed. The fruit of the common species is said to be about the size of a large plum, and green; containing a sweet, acid, and slightly-astringent, gelatinous pulp, resembling the yolk of an egg. The berry of the present kind appears to be wholly similar, except that it is spherical instead of ovate. The nuts of the Genip Tree are also eaten, after being roasted in the manner of chestnuts. The flowers appear in April, when the leaves are shed, and are very fragrant, even at a distance, attracting swarms of bees and humming-birds. This species, according to Browne, was brought to the West Indies from Surinam.

The wood of the *Melicocca trijuga*, (*Schleichera trijuga*, Willd.) of the Isles of France and Bourbon, is so hard and fine-grained as to afford to the natives a favorite wood for bows, arrows, and the shaft of their spears, called *sagayes*. The *M. bijuga* becomes a large and beautiful tree thirty to forty feet high, affording an extensive and grateful shade. The bark of the branches in the Florida plant are brownish and rough, with small whitish excrescences. The leaves are smooth on both surfaces, (in the St. Domingo specimens, a little pubescent on the midrib beneath,) of a dark shining green above, and scarcely any paler beneath. They are pinnated usually in two pairs, rarely three or only one pair, three to three and a half inches long by from one to one and three-fourths of an inch wide, with the main petiole about half an inch long; they are lanceolate or oblong, usually obtuse, delicately feather-veined, with the vessels running together and reticulating below the margin. The flowers are small, and disposed in axillary but chiefly terminal panicles. The calyx is tomentose, with five obtuse, ovate, spreading, and re-

flected segments; the petals, five, are smaller, pale yellow, and narrowed below into a minute claw. Stamens six to ten; often eight; shorter in the fertile flowers, and in them usually six. Germ ovate. Style distinct, with a capitate, somewhat three-lobed stigma. Drupe spherical, one-seeded, coated with a dry, rather brittle integument, externally yellowish.

PLATE LXVI.

*A branch of the natural size. a. The male flower. b. The female flower. c. A cluster of the drupes about half grown.*

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Common Ailanthus, (*Ailanthus glandulosa.*) This tree, originally from China, is now commonly cultivated for its shade in towns in many parts of the United States. It grows with great rapidity, and produces a great deal of wood, which is found to be of a close grain, and capable of acquiring a fine polish. In this State, it somewhat resembles satin-wood. With its durability I am unacquainted; but if found useful it might be cultivated or planted over waste lands in the Southern and Middle States with advantage.

# MAPLES.

(Erable, Fr.)

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*Natural Order*, Acerineæ. (Decand.) *Linnæan Classification*, Polygamia or Octandria, Monogynia.

ACER.* (Tournefort.)

Flowers polygamous.—The *calyx* 5-lobed, or 5-parted. *Petals* five or none. *Stamens* rarely five, often seven to nine; *ovarium* 2-lobed, stigmas two. *Samaræ* or pericarps in pairs, winged, united at base; each by abortion 1 or rarely 2-seeded, the wings of the pericarp lanceolate and diverging, thicker and blunt on the outer margin. *Embryo* curved, with wrinkled lofty cotyledons, and an inferior radicle: *albumen* none.

Trees and shrubs of temperate climates, chiefly of Europe and North America, the leaves opposite as well as the branches, palmately lobed. Flowers clustered, or pendulously racemose, arising from buds of the preceding season, mostly lateral.

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## LARGE-LEAVED MAPLE.

Acer macrophyllum. *Foliis digitato-5-lobis, sinubus rotundatis, lobis subtrilobatis repando-dentatis, subtis pubescentibus, racemis erectis, filamentis 9, hirsutis, ovariis hirsutissimis.*—Pursh, Flor. Amer. Sept., vol. i. p. 267. Decand., Prod., vol. i. p. 594.

* From the Latin, *acer*, sharp; the wood having been used for pikes or lances

La

Acer Macrophyllum.

*Large leaved Maple.* *Erable à grandes feuilles*

ACER MACROPHYLLUM. Leaves large, very deeply 5-lobed; lobes oblong or slightly cuneiform, entire, or sinuately 3-lobed, the margins somewhat repand; racemes nodding; flowers rather large; petals obovate; fruit hispid, with elongated slightly-diverging glabrous wings.—TORREY and GRAY, Flora N. Amer., vol. i. p. 246.

ACER *macrophyllum*.—HOOKER'S Flora Boreali Americana, vol. i. p. 112, t. 38.

THE topographical range of this splendid species of Maple, wholly indigenous to the northwest coast of America or the Territory of Oregon, is a somewhat narrow strip along the coast of the Pacific, not extending into the interior beyond the alluvial tracts of the Oregon, which commence at the second cataracts of that river, (known by the name of the Dalles,) and at the distance of about 130 miles from the sea. To the north it extends probably to the latitude of 50°, or the borders of Fraser's River, and, although by Decandolle it is said to extend to Upper California on the south, we did not observe it in the vicinity of Monterey; and therefore conclude that its utmost boundary in this direction must be to San Francisco, in about the 38th degree of latitude. This fine species was discovered by Menzies, and afterward collected by Lewis and Clarke. It nowhere presents a more interesting appearance to the traveller than in the immediate vicinity of the falls of the Oregon; its dense shade, due to the great magnitude of its foliage and lofty elevation, as well as the wide extent of its spreading summit, are greatly contrasted with the naked, woodless plains of that river, which continue uninterruptedly to the mountains,—a tract over which the traveller seeks in vain for shade or shelter, and where the fuel requisite to cook his scanty meal has to be collected from the accidental drift-wood which has been borne down from the distant mountains of its sources.

The largest trunks of this species that we have seen were on the rich alluvial plains of the Wahlamet, and particularly near to its confluence with the Tlacamas; here we saw trees from

fifty to ninety feet in height, with a circumference of eight to sixteen feet. It appears always to affect the drier and more elevated tracts, where the soil is well drained.

The wood, like that of the Sugar Maple, exhibits the most beautiful variety in its texture, some of it being undulated or curled,—other portions present the numerous concentric spots which constitute the Bird's-eye Maple; and so frequent is this structure, that nearly every large tree which was cut down afforded one or other of these varieties of wood. As yet, in those remote and unsettled regions, it has only afforded a beautiful and curious material for the gun-stock of the savage or the hunter. Like the Sugar Maple, also, it affords an abundance of saccharine sap, which, to an infant settlement, may one day be turned to advantage. As an ornamental plant, it stands pre-eminent; and from the latitude it occupies it must be entirely hardy in every part of Europe below the latitude of 60°. The young trees are often tall, slender, and graceful, and when in blossom, which is about the month of April, present a very imposing appearance, clad with numerous drooping racemes of rather conspicuous yellowish and somewhat fragrant flowers. At an after-period, the spreading summit of deep green leaves, each near a foot in diameter, affords an impervious and complete shade. The fruit or carpels are also larger than usual, and have the remarkable character of being clothed, even when ripe, with strong hispid hairs. The flowers, irregular in the number of their parts, present often as many as ten sepals in two rows, and the same number of stamens. The carpels or seed-vessels also grow sometimes as many as three together.

According to Loudon, specimens of the timber, which were sent home by Douglas, exhibit a grain scarcely inferior in beauty to the finest satin-wood. A tree, grown in the London Horticultural Society's Garden, had, in 1835, attained the height of twenty-five feet; and it makes, when well cultivated, annual shoots of from six to ten feet in length, and plants are

Acer Circinatum

*Round leaved Maple* — *Erable Circiné*

to be had in London at half a crown a-piece. It deserves to be cultivated also in the United States, as it is one of the most useful and ornamental trees of the genus, and at the same time perfectly hardy in all temperate climates.

PLATE LXVII.

*A leaf of the natural size. a. The raceme of flowers. b. The fruit.*

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# ROUND-LEAVED MAPLE.

Acer circinatum. *Foliis orbiculatis basi subcordatis 7-lobis inæqualiter acuto-dentatis utrinque glabris, nervis venisque ad axillas pilosis.*—Pursh, Flor. Am. Sept., i. p. 267. Hooker, Flor. Bor. Am., i. p. 112, t. 39.

Acer circinatum. Leaves cordate, 7 to 9-lobed, the nerves all radiating directly from the apex of the petiole; lobes very acutely serrate, with a slender acumination; corymb few-flowered; petals ovate or linear, shorter than the calyx; fruit glabrous, with oblong, divaricate wings.—Torrey and Gray, Flor. Am., i. p. 247.

This remarkable species, like the preceding, is confined to a narrow district along the coast of the Pacific, bounded, according to the observations of Mr. Douglas, between the latitudes of 43° and 49°. It is certain that we did not meet with it in any part of Upper California, and it is therefore fully as hardy as the preceding. Though much more singular in mode of growth and general appearance, it has nothing of its imposing grandeur. The trunk, which is smooth, only attains the height of fifteen to forty feet. It affects the lowest alluvial flats that escape the influence of the periodical inundations to which the rivers it borders are subject; here the stems arise in clusters

of four or five together, conjoined at the root, from whence they spread out in wide curves, sending off slender, spreading branches, that often on touching the ground strike out roots, and give rise to offsets so numerous and so entangled as almost wholly to obstruct the progress of the hunter through the forest. The dense shade it also produces excludes nearly every other vegetable, and its curved and interlaced trunks, like those of the Mangrove, form a kindred forest sometimes of several acres in extent. It is this singular tree, chiefly in connection with the Large-Leaved Maple, which, on descending the Oregon, at the Lower Falls, first presents us with the phenomenon of a forest, and that, too, of the most impervious shade, and which, in low situations, continues to accompany us even into the heart of the Pine forest, to the shores of the Pacific.

According to Douglas, the wood is fine, white, close-grained, tough, and susceptible of a good polish, and, like that of the Red Maple, it sometimes presents a beautiful curled fibre. From the slender branches, the aborigines make the hoops of their large scoop-nets employed in taking the salmon at the rapids, and in the contracted parts of the river, to which they ascend.

The leaves of this species are of a delicate and thin consistence, and, from their nearly-equal and numerous points, with the straight direction of the ribs, present the appearance of small, outspread fans. At the extremities of the twigs, when the leaves are almost fully grown, in the month of May, come out the scattered clusters of flowers, which at a little distance appear red, from the color of the calyx. The fruit itself, or winged capsules, also appear of a bright and lively red, and have a peculiarity in the direction of the wings, nearly at right angles with the peduncle or flower-stalk, which does not exist in any other of our species.

Judging merely from the very brief specific character of the *Acer septemlobum* of Japan, as described by Thunberg, we

Acer Grandidentatum

*Mountain Sugar Maple* *Erable de Montagne*

should imagine there existed in that species no inconsiderable affinity with our plant.

PLATE LXVIII.

*A twig of the natural size. a. The fertile flowers. b. The male flowers.*

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# MOUNTAIN SUGAR MAPLE.

ACER GRANDIDENTATUM. Leaves slightly cordate or truncate at the base, with a minute sinus; pubescent beneath; rather deeply 3-lobed, the sinuses broad and rounded; lobes acute, with a few sinuous indentations; corymb nearly sessile, few-flowered; the pedicels nodding; fruit glabrous, with small diverging wings.—NUTTALL, in TORREY and GRAY, Flora N. Am., i. p. 247. *A. barbatum?*—DOUGL., in HOOK., Flora Bor. Am., l. c., (not of MICHAUX.)

THIS species, nearly related to the Common Sugar Maple, occurs in the high valleys of the Rocky Mountains, nearly in the same situations with the Currant-Leaved species, forming small groves by themselves, remarkable for the delicate paleness of their verdure, and filling, apparently, situations occupied by scarcely any other forest trees but the trembling and large-toothed Poplars. They never attain the magnitude of the true Sugar Maple, all that we saw being mere saplings of eighteen to twenty feet high, and but little thicker than a man's leg, with a smooth, pale bark. The leaves are also smaller, as well as the winged capsules, and the leaves, when adult, are still rather softly hairy beneath, and with both surfaces nearly of the same color; the pedicels and base of the calyx are also hairy. From the affinities of this species, there can be little doubt but that it might be employed, as far as it

goes, for all the purposes to which the Sugar Maple is applicable, and, probably, in some of the richer and lower lands, it may attain a sufficient growth for economical purposes.

This species is, doubtless, the *Acer barbatum* of Douglas, not of Michaux, (which is indeed a nonentity made of fragments of several species.) He found it growing in valleys, near springs, on the west side of the Rocky Mountains, near the sources of the Columbia. We also met with it in a lofty ravine on the Three Butes, two days' march to the west of Lewis's River. The real Sugar Maple is said by Torrey and Gray to grow as far west as Arkansas and the Rocky Mountains.

PLATE LXIX.

*A branch of the natural size, with the fruit.*

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# DRUMMOND'S MAPLE.

ACER DRUMMONDII. *Foliis cordatis majusculis, 3–5-lobatis subtus tomentosis canescentibus lobis acutis fastigiatis inæqualiter incisa-dentatis, pedicellis elongatis, fructibus glabris, alis late lanceolatis vix divergentibus.*

ACER DRUMMONDII.—HOOKER and ARNOTT, in Journ. Botan., p. 199.

ACER RUBRUM, γ?—TORREY and GRAY, Flora N. Amer., vol. i. p. 684.

THIS fine species of Maple was discovered, by Drummond and Professor Carpenter, in Louisiana. It is found exclusively in very low swamps generally subject to inundation, and flowers in February, three weeks earlier than any other species in the same country, according to Professor Carpenter: he met with it more particularly in the swamps of Opelousas.

This tree, though allied to the Red Maple, appears to be suffi-

Acer Drummondii.

*Drummond's Maple* *Erable de Drummond*

ciently distinct from that species as well by its general appearance as its geographical range, as yet being only known to the swamps of Louisiana. I have also been told of its existence in the province of Texas.

The bark of the small branches appears to be light brown; the young shoots, petioles, and the lower side of the leaves, are clothed, even when adult, with a white, soft, and woolly pubescence, which, when removed from the foliage, leaves a glaucous surface; above, they are smooth. The leaves are three to four and a half inches long by four or five wide, with three to five rather short lobes, having acute sinuses; the lower lobes are small and obtuse, the terminal ones acute, but scarcely acuminate, and the central lobe scarcely longer than the rest; the base of the leaf, when fully grown, is auriculated with a small sinus; the margin is irregularly serrated and toothed, with the serratures and teeth distant and often obtuse. The fruit, situated on long, smooth, clustered peduncles, is at first divergent at an acute angle, at length almost convergent by the inner enlargement of the wing of the carpel, which is broadly lanceolate, strongly veined, and confluent below, down to the juncture of the fruit. The wings of the samara are at first reddish, at length brown. The adult samara is from one and a half to one and three-fourths of an inch long and about half an inch wide.

## PLATE LXX.

*A branch of the natural size, with a cluster of the fruit in a young state, and the adult samara.*

# CURRANT-LEAVED MAPLE.

ACER TRIPARTITUM. *Foliis subreniformi-orbicularis trifidis tripartitisve, laciniis inciso-dentatis, medio cuneiformibus sublobatis, lateralibus subrhomboideo, racemis corymbosis; fructibus glabris, alis brevissimis latis cuneato-ovalibus divergentibus.*

ACER *tripartitum*. Leaves with a subreniform, orbicular outline, 3-cleft or 3-parted; segments incisely toothed; the middle one cuneiform, often slightly lobed, the lateral ones somewhat rhomboidal; racemes corymbose; fruit glabrous, with very short and broad cuneate-oval diverging wings.—NUTTALL, in TORREY and GRAY'S Flora Bor. Am., i. p. 247.

THIS singular shrub, which we introduce into the Sylva of the United States to complete the history of the Maples, was discovered in the Rocky Mountain range, in about the latitude of 40°, within the line of Upper California, in the narrow valleys and ravines occupying the lofty hills near the borders of Bear River, which passes into the Lake of Timpanogos. It appeared to be a scarce species, confined to an alpine region; for we found, by observing the boiling-point of water, that the plains themselves, stretching far and wide like interminable meadows or steppes, were elevated between six and seven thousand feet above the level of the ocean.

At a little distance, this diminutive species might have been taken for a Currant bush both in the size of the plant and by its leaves. It formed small clumps on the declivities of the mountains, where some moisture still remained amid the drought which constantly prevails throughout the summer in this Western mountain tract. From the cool and elevated region occupied by this species, it is certain that it might be cultivated in all the temperate parts of Europe and the United States, as a matter of curiosity, if not of beauty. The leaves, divided

Acer tripartitum.

*Currant leaved Maple* *Erable tripartite*

down to the base, make an approach in habit to the genus *Negundo* or Box Elder, though in other respects different.

The height of this species is not more than about three feet. The leaves have petioles longer than themselves. The branches are whitish and smooth, as is every other part of the plant; the leaves of a dark, glossy green. The winged fruit is small, and in proportion with the reduced stature of the species, having the wings broad even at the base, so as to leave between them an unusually-small sinus. Bud-scales broad-ovate, villous within.

Japan again affords, apparently, an analogous species to the present in the *Acer trifidum* of Thunberg; but in this the leaves are also entire as well as trifid, and the divisions themselves entire. It is also marked as becoming a tree.

PLATE LXXI.

*A branch of the natural size.*

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# DWARF MAPLE.

Acer glabrum. *Foliis subrotundis, 3–5-lobatis basi truncatis, lobis incisis acute dentatis utrinque glabris, corymbis pedunculatis; fructibus glabris, alis erectis suboboratis brevibus; petiolis foliis brevioribus.*

*Acer glabrum.*—Torrey, Am. Lyceum N. York, vol. ii. p. 172.

Acer glabrum. Leaves nearly orbicular, truncate or subcordate at base, 3 to 5-lobed; lobes short and broad, acutely incised and toothed; flowers in a corymbose raceme, fruit glabrous, the wings very short and broad, somewhat obovate, nearly erect.—Torrey and Gray, Flor. N. Am., vol. i. p. 247.

This diminutive species, closely related to the Currant-leaved Maple, was met with in the Rocky Mountains, by Dr. James,

in about the latitude of 40°. In size and form, the leaves resemble the Common Currant, and are somewhat smaller than in the preceding; they are smooth, and commonly three-lobed, with very acute and narrow sinuses, which scarcely extend down to the middle of the leaf; the lobes are broader than long, blunt, and often subdivided into two or three lesser parts. The petioles are shorter than the leaves. The flowers about six, in a short, umbellate raceme. Stamens and linear-oi[illegible] sepals quite smooth. Stamens about eight, with the same number of sepals. The wings of the fruit approach the size of those of the European *Acer campestre*, or a little shorter, but broader and more obtuse. Douglas also found the same species (according to Torrey and Gray) growing in the Blue Mountains of Oregon, which are about forty miles east of the Oregon or Columbia River.

We have not had an opportunity of figuring this species, the specimens being too imperfect.

In regard to the geographical limits of the North American Maples, the *A. dasycarpum*, or WHITE MAPLE, so abundant along all the great Western streams, also continues into the Western prairies as far as the banks of the Arkansas, till at length, stripped of its rich alluvial lands, it enters the arid plains of the Far West. It is also met with on the banks of the Kansas and Big Vermilion River, west of the Missouri, accompanied by the *Negundo aceroides*, or Box Elder, which latter continues to the borders of the Platte. It is now much cultivated as a shade tree in the streets of our towns and cities, where it grows with rapidity, and is not attacked by insects.

---

The R[illegible] (*A. rubrum*,) which extends from the Gulf of Mexico [illegible], is also, according to Douglas, found west

of the sources of the Oregon: this fact, however, we have not been able to corroborate. A variety with *yellowish* flowers, noticed by Marshall, is not unfrequent in the vicinity of Philadelphia, in New Jersey, and in Chester county, according to Dr. Darlington. In this the leaves are smaller and three-lobed, and more or less tomentose beneath.

---

The BEARDED MAPLE, (*A. barbatum* of Michaux,) according to Torrey and Gray, turns out to be a nonentity, as it is founded upon the flowers of the Sugar Maple, the fruit of the Red Maple, and a leaf (probably) of the *Acer spicatum* or Mountain Maple!

---

SUGAR MAPLE, (*A. saccharinum.*) It is reported that 1,065,000 pounds of maple sugar have been made annually of late in New Hampshire, and that several of the counties use it exclusively, raising some also for sale.

The Sugar Maple, in and about Warwick, Goshen, and Edenville, in the State of New York, as well as in the neighboring parts of New Jersey, attains an unusually-large growth. Trees near Edenville may be seen which are eighty to ninety feet high, and with a diameter of from two, three, or even four feet. A very vigorous tree with a round summit, clad nearly to the base with a dense and very shady circle of branches, about seventy feet high, having a diameter of two feet ten inches, and yet a comparatively young and vigorous tree, may be seen near the late Dr. Fowler's house, at Franklin Furnace; and several others in the same neighborhood appear equally beautiful and large. In the old trees, the bark, accumulating for ages, gives the trunk a rough and shaggy appearance, almost equal to that of the Shellbark Hickory.

Of this genus [illegible] are, according to Decandolle, one species

in Tartary, five in Europe, (excluding varieties erected into species,) six in Japan, *one* with oblong, acuminate, entire leaves in Nepaul, and specimens of six more species in the Herbarium of the Academy of Natural Sciences of Philadelphia, collected also in Nepaul, by Dr. Wallich, and probably in the region of the Himalaya Mountains. Of these the most remarkable is the *Acer caudatum*, with unequally-serrated three-lobed leaves, having slender acuminated points an inch or more in length.

Negundo Californicum

*Californian Box Elder* *Erable de Californie*

# NEGUNDO.

(Moench., Nutt., Gen. Am.) Acer, (Linn.)

---

Flowers dioecious. *Calyx* minute, 4 to 5-toothed. *Petals* none. Male. —*Stamens* four to five, anthers linear and acuminate. *Samara* (or fruit) similar to that of the Maple.

Trees of North America, with pinnate or twice trifoliate leaves, the leaves ovate or lanceolate, toothed or incisely cleft, resembling those of an Ash. Racemes of the male flowers short and aggregated, with filiform pedicels. Fertile flowers racemose.

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## CALIFORNIAN BOX ELDER.

Negundo Californicum. *Foliis trifoliolatis pubescentibus junioribus tomentosis, foliolis ovatis acuminatis trilobatis inciso-serratis; ramulis pubescentibus.*

*Negundo Californicum.*—Hook. and Arnott, Bot. Beechy, Suppl., p. 327, t. 77. Torrey and Gray, Flora, vol. i. pp. 250 and 684.

Of this species, collected by Douglas in Upper California, we know nothing from personal observation, not having met with it in our visit to that country. It is remarkable for the almost tomentose pubescence of its leaves, and the petioles and young branchlets are said to be velvety; the leaflets, usually three, are ovate-acuminate, three-lobed, cleft, and serrated. The samara

oblong, pubescent, rather shorter than the oblique, obovate, and nearly erect wings of the seed.

It appears there is yet a third species of this genus, called by Decandolle, *Negundo Mexicanum*, which has also trifoliate leaves.

## PLATE LXXII.

*A branch of the natural size, in fruit. a. The male flowers.*

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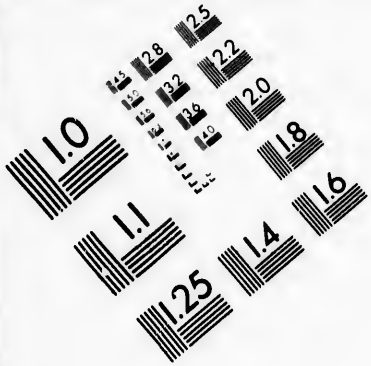
Box Elder, (*Negundo aceroides.*) This tree, on the low alluvial borders of rivers, extends much farther to the north than was supposed by Michaux. Richardson, Drummond, and Douglas found it to be abundant about the Red River and Saskatchawan, which latter river (in latitude 54°) is its most northern limit. It also occurs on the western banks of the Missouri, and those of the streams which enter it from the west. It likewise extends into the interior of Arkansas, and for some distance on the borders of the Platte. According to Douglas, the Crow Indians manufacture sugar from its sap; but it is not near as saccharine as that of the Sugar Maple.



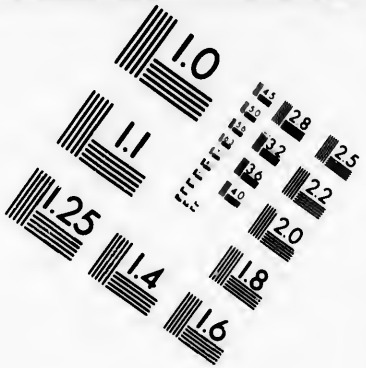
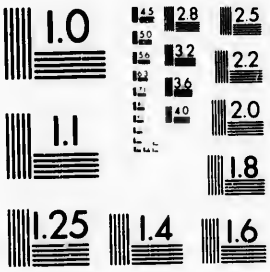
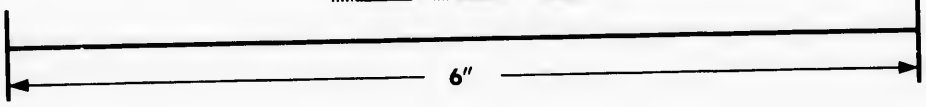
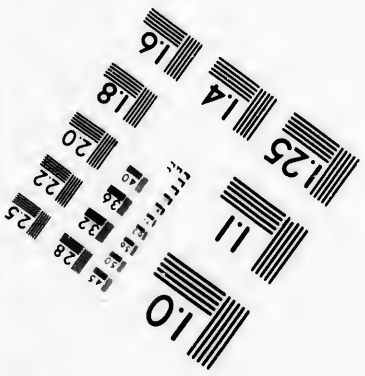
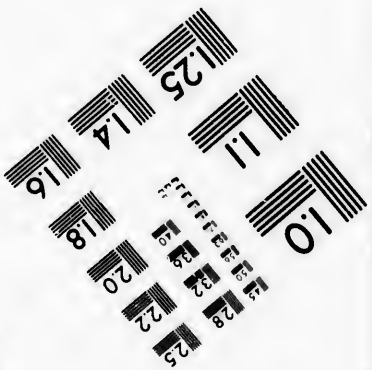




**IMAGE EVALUATION**
**TEST TARGET (MT-3)**

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Clif tonia ligustrina.

*Buck Wheat Tree.* *Cliptonie à feuilles de Troene*

# BUCKWHEAT TREE.

*Natural Order*, MALPIGHIACEÆ. (Juss.) *Linnæan Classification*, DECANDRIA, MONOGYNIA.

CLIFTONIA.* (SOLANDER, Herb., BANKS and GAERTNER.) MYLOCARIUM. (WILLD., EHRH.)

*Calyx* inferior, 5-cleft. *Petals* five, unguiculate. *Stamens* ten, five of them shorter, the filaments dilated at base; anthers opening longitudinally. *Germ* prismatic, 3 or 4-sided. *Stigma* sessile, 3 or 4-lobed. *Capsule* dilated, mostly 3-winged, 3-celled. *Seed* solitary.

A tree with alternate, entire, coriaceous, evergreen leaves, without stipules. Flowers bracteolate, in terminal racemes, white tinged with a blush of red.

## BUCKWHEAT TREE.

CLIFTONIA LIGUSTRINA. *Mylocarium ligustrinum*, WILLD., EHRH., Hab Berol. PURSH, Flor. Bor. Am., i, p. 302, t. 14. ELLIOTT, Sketch I. p. 508. Bot. Mag., t. 1625.

THIS elegant tree, which enlivens the borders of the pine-barren swamps of the South, is met with nowhere to the north of the Savannah River, on the line of Georgia and South Carolina. From hence it is occasionally seen in all the lower and

* In honor of Dr. Francis Clifton, of London, a Fellow of the Royal Society, and a medical writer of the last century.

maritime region of Georgia, as well as the lower part of Alabama and West Florida. It attains the height of eight to fifteen or more feet, being much branched, and spreading out at the summit like an Apple Tree. The verticillate branches are regularly covered with a smooth gray bark. The wood is compact and whitish. It is exceedingly ornamental in flower, which takes place in early spring, in the month of March, when the whole surface of the tree is covered with the most delicate, elegant, and somewhat fragrant flowers. The borders of all the still and sluggish streams and the dark swamps of the South are enlivened by the numerous trees of this species with which they are interspersed. In the intervals of their shade, in West Florida, we frequently saw growing, and already in flower, the Atamasco, Lily, or Amaryllis of the North.

When the flowers are past, the tree puts on a still more curious appearance, being loaded with triangular, winged capsules resembling Buckwheat; and hence its common name. The leaves resemble those of Privet, are evergreen, thick, very smooth, not perceptibly veined, and glaucous beneath.

In the spring of 1773, the indefatigable Wm. Bartram discovered this tree, where I afterward also saw it growing, on the borders of the Savannah River, in Georgia. He thus very clearly describes it as "a new shrub of great beauty and singularity. It grows erect, seven or eight feet high. A multitude of stems arise from its root, there divide themselves into ascending branches, which are garnished with abundance of narrow, lanceolate, obtuse-pointed leaves, of a light green, smooth and shining. These branches, with their many subdivisions, terminate in simple racemes of pale incarnate flowers, which make a fine appearance among the leaves. The flowers are succeeded by desiccated triquetrous pericarpi, each containing a single kernel." (Bartram's Travels, p. 31.)

How so fine a plant came to be overlooked for near half a century is really surprising, considering the avidity of collec-

tors and gardeners. In the Northern States and in Britain, it is a hardy greenhouse plant, and well worth cultivating. But to see it in perfection, you must behold it in its native swamps, attaining the magnitude of a tree, and blooming profusely on the verge of winter, without any thing near it as a contrast, save a withered carpet of leaves and leafless plants, and in the midst of a gloom and solitude that scarcely any thing else at the same time relieves.

In Bartram's Botanic Garden, (Philadelphia,) it appeared to be quite hardy, and survived for many years without any protection.

## PLATE LXXIII.

*A branch of the natural size; the fruit.*

# CYRILLA.

*Natural Order*, CYRILEÆ.* (Torrey and Gray, in note, Flor. N. Amer., vol. i. p. 256.) ERICEÆ. (Jussieu.) *Linnæan Classification*, PENTANDRIA, MONOGYNIA.

CYRILLA.† (RICHARD, in MICH. DR. GARDEN and LINN., excluding the fruit.)

*Calyx* 5-parted, persistent, the divisions small, ovate-lanceolate, acute. *Petals* five, sessile, lanceolate, and acute, thick and convex in the centre, exceeding the length of the calyx. *Stamens* five, about the length of the petals, the filaments subulate, anthers cordate, distinct, 2-celled, opening longitudinally. *Ovary* superior, oval, with a short style, and two or rarely three thick obtuse stigmas; *ovules* solitary, suspended. *Pericarp* oval, small, at first somewhat fleshy indehiscent, at length suberose, 2-celled, the cells 1-seeded, and the seed penduloas from the summit of the cells.

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* To this genus, as a natural group, Torrey and Gray refer also the *Cliftonia*, (*Mylocarium*, WILLD.,) as well as the *Elliottia* of Muhlenberg, and the whole are considered as a suborder of ERICACEÆ. Of Elliottia, however, I conceive we know too little to be able to decide on its natural affinities: it will probably remain near Clethra in Ericaceæ. *Cliftonia* appears to be inseparable from the MALPIGHIACEÆ. The only genus, then, at present embraced in this order is that of Cyrilla, which, without any real affinity to the Ericaceæ, is allied to the MALPIGHIACEÆ by its fruit. The description of the genus, for the present, may be considered also as that of the order. The fruit of some other plant than the present is described by Linnæus, Schreber, Willdenow, L'Heritier, and Duhamel; as they give a bilocular, bivalvular capsule, containing many small angular seeds. It is to Richard, in Michaux, that we owe the first correct description of the fruit of Cyrilla.

† In honor of Dominico Cyrilli, professor of Medicine, at Naples, and a botanical author.

Cyrilla racemiflora.

*Carolina Cyrilla* *Cyrille de Caroline*

# CAROLINA CYRILLA.

CYRILLA RACEMIFLORA. *Foliis cuneato-lanceolatis, vix acutis, sub-membranaceis, glabris, petalis calyce triplo longioribus medio convexis.*

CYRILLA *racemiflora.*—LINN., Mantis, p. 50. WALTER., Flor. Carol., p. 103. WILLD., Sp. pl., l. c. ELLIOTT, Sketch., vol. i. p. 291. Nouv. DUHAMEL, vol. i. p. 115, tab. 46.

CYRILLA *racemifera.*—VANDELL., Florul. Lusitan. et Bresil, specim. 88.

CYRILLA *Caroliniana.*—RICHARD, in MICH., Flor. Bor. Am., vol. i. p. 158. PERSOON, vol. i. p. 175.

ITEA *Cyrilla.*—L'HERIT., Stirp., vol. i. p. 137, tab. 66. SWARTZ, Prod., p. 50. Sp. pl., vol. i. p. 1146.

THIS very elegant tree begins to appear in the low humid woods and pine-barrens of South Carolina, in swampy places, where it attains the height of twelve to twenty feet, with a diameter of eight to ten inches, and is sometimes so loaded with its numerous racemes of white flowers that we can scarcely perceive the leaves. It is, in fact, one of the most beautiful trees of the Southern forests, and is therefore often preserved in the vicinity of habitations as an ornament. It continues to be met with throughout Georgia and the Floridas, reappears in the West Indies, and was discovered by Vellozo in Brazil. According to Michaux the elder, there is also a second species, (*Cyrilla Antillana.*) with laurel-like leaves, in the Antilles.

From the name of Iron-Wood sometimes given to it by the English, it would appear that the wood is hard and close-grained; but no experiments have yet been made upon it. In Bartram's Botanic Garden, Philadelphia, it is perfectly hardy: there is now growing there a tree near upon twenty feet high, and two feet two inches in circumference. The bark on the old trunks is of a reddish-brown color, in layers of about a line in thickness, of a soft, elastic, fibrous, and friable consistence,

almost like Agaric, and may be used like that substance as a styptic.

The tree presents a widely-spreading bright green summit, and the branches come out in a circular order, presenting numerous slender twigs. The leaves are alternate, rather narrow, and lanceolate, very entire, sometimes oblanceolate, nearly perennial. The flowers are small but very numerous, disposed in slender pendulous racemes, producing a very graceful effect, and these racemes are clustered at the extremities of the branches of the former season. The petals are three times as long as the calyx, inserted without claws at the base of the germ, and have each an oblong, convex elevation or thickening of the petal on the lower part. The filaments alternate with the petals, and are somewhat shorter. The anthers are incumbent, cordate, 2-celled, bifid at the base. Style short, the stigmas two and obtuse. The pericarp, of an oval form, never opens, is 2-celled, the sides filled with a dry, spongy, granular pulp, and with a single ovate seed in each cell.

## PLATE LXXIV.

*A branch of the natural size. a. The flower enlarged.*

# MAHOGANY.

(Mahagon, Fr.)

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*Natural Order*, Cedreleæ. (R. Brown.) *Linnæan Classification*, Decandria, Monogynia.

SWIETENIA.* (Linn.)

*Calyx* minute, 4 to 5-lobed, deciduous. *Petals* four or five. *Stamina* eight to ten, united into a subcampanulate ten-toothed tube, internally antheriferous. *Style* short; stigma discoid, dentate. *Capsule* ovoid, large and woody, 5-celled, many-seeded, opening from the base upward, with five marginal valves; the axis large, persistent, pentangular above, 5-winged below, with the partitions of the valves. *Seeds* alated, pendulous, about twelve in each cell, imbricated in a double series. *Embryo* transverse. *Cotyledons* confluent in and confounded with the fleshy albumen.

Trees of warm or tropical climates, chiefly India and America, with hard dark-reddish wood. The leaves abruptly pinnated, mostly with unequal-sided leaflets. Flowers in axillary or somewhat terminal loose panicles.

---

* Named by Jacquin, in honor of Gerard L. B. Von *Swieten*, archiater to Maria Theresa, Empress of Germany, who, at his persuasion, founded the Botanic Garden at Vienna.

# MAHOGANY TREE.

SWIETENIA MAHOGONI. *Foliis subquadrijugis, foliolis ovato-lanceolatis falcatis acuminatis basi inæqualibus, racemis axillaribus paniculatis.*—LINN., Sp. p. DECAND., Prod., vol. i. p. 625. CAVAN., Dissert., vol. vii. p. 365, t. 209. JACQ., Amer., (ed. picta.) p. 127. CATESBY, Carol., vol. ii. t. 81. ADR. JUSSIEU, Mem. Mus., vol. xix. p. 249, t. 11. LAMARCK, Encyc., vol. iii. p. 678. HOOK., Bot. Miscel., vol. i. p. 21, t. 16. TORREY and GRAY, Flor., vol. i. p. 242.

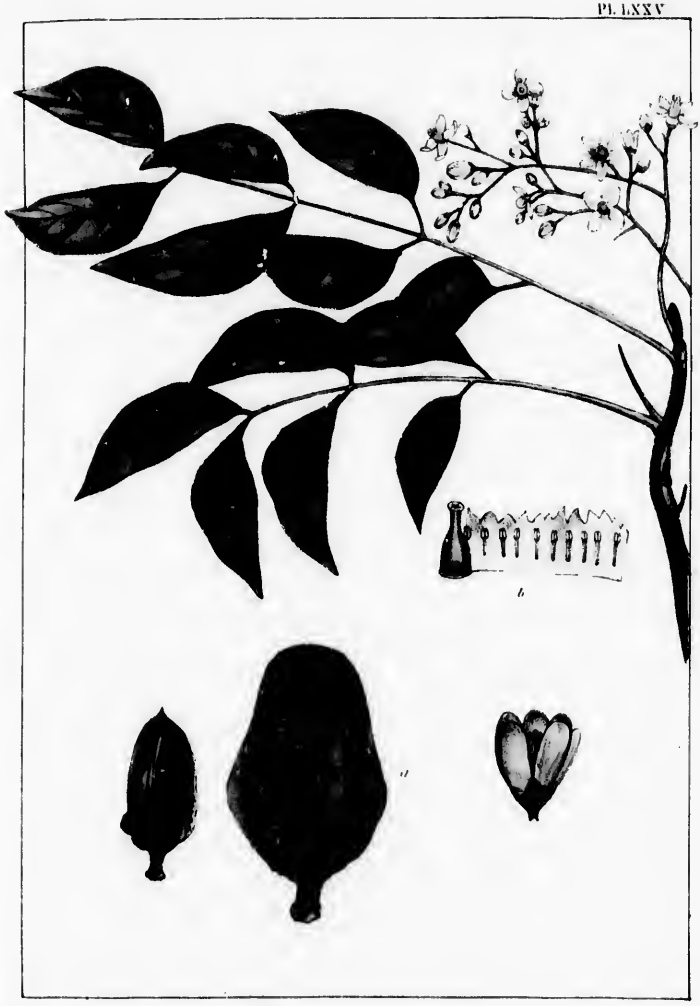
CEDRELA *foliis pinnatis, floribus sparsis, ligno graciori.*—BROWNE, Jam., p. 158.

CEDRUS *mahagoni.*—MILLER, Dict., No. 2.

THE late Dr. Muhlenberg was the first to announce the existence of the Mahogany Tree within the limits of the United States, and he gives it in his catalogue as a native of Florida. Torrey and Gray add, in their Flora, "We have seen, in the herbarium of the late Mr. Croom, a capsule from a collection made in Southern Florida by the late Dr. Leitner, who considered the tree to which it belonged to be the true Mahogany:" vol. i. p. 242. In one of those botanical excursions to explore the wilds of Florida, in which he had previously been so eminently successful, the indefatigable Leitner fell a victim to the savage hostility which has so long been protracted over that devoted soil. He ascended a creek into the interior, and was seen no more!

> "Facilis descensus Averno:
> Sed revocare gradum, superasque evadere auras,
> Hoc opus, hic labor est"
>
> ÆNEID, lib. vi.

The Mahogany Tree is said to be of rapid growth, becoming a lofty tree, with a graceful, spreading summit, the stem attaining very large dimensions, acquiring a diameter of five or six feet. It grows in the warmest parts of America, as in Cuba,




Swietenia Mahagoni.

*Mahogany Tree* *Mahogoni d'Amerique.*

Jamaica, St. Domingo, Acapulco on the Pacific, Realijo in Guatemala, and the Bahama Islands, and generally affects a rocky soil or the sides of mountains, growing often in places almost absolutely deprived of earth. The seeds germinate in the clefts of rocks, and when the roots meet any insurmountable impediment they spread out and creep till they find entrance into other clefts into which they can penetrate; and sometimes it happens that the increasing dimensions of the roots succeed so far as to split the rocks themselves. Such trees in the Bahama Islands, growing so contorted for want of soil, produce the much-esteemed and curiously-veined wood known in Europe as "Madeira wood." In Jamaica, it is also a common tree on the plains or lower hill-sides; and Dr. Macfadyen remarks, in that island he had never met with it at an elevation above three thousand feet, nor very close to the sea-shore. In some of the islands it is now rare in the neighborhood of the sea, because of its convenience for embarkation; and it is cut down of all ages, without any thought for the future.

Dr. Macfadyen, speaking of the Mahogany of Jamaica, says, "It is at present much more scarce than it appears to have formerly been. It was from this island that the supply for Europe was in former times principally obtained, and the old Jamaica Mahogany is still considered superior to any that can now be procured from other countries. In 1753, according to Dr. Browne, 521,300 feet in planks were shipped from this island, but at present very little is exported from it. It was formerly so plentiful as to be applied to the commonest purposes,—such as planks, boards, shingles, &c." "The beauty of the Mahogany wood is said to have been first discovered by a carpenter on board of Sir Walter Raleigh's vessel, at the time the ship was in harbor at Trinidad, in 1595." The first use to which it was applied in England was the humble one of forming a candle-box; and, about the end of the seventeenth century, it was brought into notice by Dr. Gibbons, a London phy-

sician, who had received planks of it from his brother, commanding a vessel in the West India trade; since which time it has been employed for costly furniture, and occupies the most distinguished place in the drawing-rooms of nobility and fashion, quite supplanting the old oaken tables and domestic panelling of antiquity.

The most beautiful wood, for variety of figure and agreeable accident, is obtained from sections of the base of the stem and root. No other wood can rival it for diversity of shades, presenting spots, waves, and clouds more varied even than the tortoise-shell, which it so much resembles. Its superior density also allows it to acquire the highest polish of which any wood is susceptible.

The principal supply of Mahogany is now obtained from Honduras; but it is of a very inferior quality, being open-grained, light and porous, and of a paler and inferior color. Trees, it seems, grown in low or alluvial lands never give a rich and hard wood. Hence the Mahogany of St. Domingo and that of the Bahama Islands are considered superior to what is at present exported from Jamaica. It was formerly employed by the Spaniards of Havana in ship-building; and it is said to be unattacked by worms, to endure long in water, and to receive the bullet without splitting. Mr. Crout, cabinet-maker, Philadelphia, so curious in our native woods, has favored me with a specimen of Mahogany from East Florida, remarkable for its waving spots, which almost exactly resemble those of the Bird's-eye Maple.

The bark of the Mahogany is astringent, and considered useful in diarrhœa; indeed, it resembles that of the Cinchona in color and taste, though somewhat more bitter. It has been given with success in powder, as a substitute for Peruvian Bark.*

* Macfadyen, Flora Jamaic., p. 177.

The leaves of the Mahogany have a very light, airy, and graceful appearance, feathered or pinnate, in three to five pairs of leaflets, ending abruptly without any terminal one. They are remarkable for their obliquity or the inequality of their sides, the lower portion of the leaf from the midrib not being more than half as wide as the upper; they are quite entire, smooth, shining, and coriaceous like the Laurel, being probably of long duration, and giving the tree the character of an evergreen; their form is between ovate and lanceolate, with a very slender and sharply-acuminated point; the general foot-stalk is about an inch and a half long. The flowers are small and greenish yellow, disposed in loose, axillary, long pedunculated panicles, three to four inches long and pendent. The flowers and their mode of growth are a good deal like those of the Melia, or Pride of India; but they are smaller. The calyx is minute, with five very shallow lobes. Petals oblong-ovate. Tube of the stamens cylindric-campanulate, ten-toothed, internally a little below the summit, bearing the anthers, which are small, yellow, and alternating with the teeth of the tube. A short denticulate disk encircles the base of the ovary. Ovary ovate, green; style cylindrical; the stigma peltate, with five denticulations. Capsule egg-shaped, the size of an orange, rufous-brown, minutely tuberculated, five-celled, opening with five valves from the base, covered within with a distinct coriaceous plate. Receptacle central, large, pentagonal, with the angles prominent, opposite, and meeting up with the edges of the valves, so as to form the septa of the cells; seeds at the apex of the receptacle, fifteen in each cell, compressed, truncated at base, expanded at the summit into a membranaceous, oblong wing.

To show the present extensive use of Mahogany in England, it may be sufficient to mention that in 1829 the importation amounted to 19,335 tons.

In Cuba and Honduras, it becomes one of the most majestic

of trees, growing and increasing for some centuries. Its gigantic trunk throws out such massive arms, and spreads the shade of its shining green leaves over such a vast surface, that all other trees appear insignificant in the comparison. A single log not unfrequently weighs six or seven tons, and a tree has been known to contain as much as 12,000 superficial feet, and to have produced upward of 1000*l.* sterling. The largest log ever cut in Honduras was seventeen feet long, fifty-seven inches broad, and five feet four inches in depth; measuring 5168 superficial feet, or fifteen tons' weight.

The Mahogany of Honduras* is cut about the month of August, by gangs of men of from twenty to fifty each. The woods are penetrated and surveyed from the summit of some lofty tree, and the leaves at this season, having acquired a yellow-reddish hue, are discerned by an accustomed eye at a great distance. The trees are commonly cut ten or twelve feet from the ground, a stage being erected for the purpose. The trunk, from the dimensions of the wood it furnishes, is deemed the most valuable; but for ornamental purposes the limbs or branches are generally preferred.

A sufficient number of trees being felled to occupy the gang during the season, they commence cutting the roads upon which they are to be transported. This may fairly be estimated at two-thirds of the labor and expense of mahogany-cutting. Each mahogany-work forms in itself a small village on the bank of a river,—the choice of situation being always regulated by the proximity of such river to the Mahogany intended as the object of future operation.

These roads are cleared out by the cutlass and the axe, in the same manner that the first roads in our back-forests are made; bridges have also to be constructed. The trunks of the trees

* Supposed by Mr. R. Browne to be a peculiar species, on the authority of Browne's "History of Jamaica."

are then cut into square logs. April and May, being the dryest season in this climate, are chosen as the only time when the logs can be drawn to their destination from the interior of the forest. Each truck requires seven pair of oxen and two drivers, and twelve to lead or put the logs on the carriages. From the intense heat of the sun, the cattle especially would be unable to work during its influence, and consequently the loading and carriage of the timber is performed in the night. On the rise of the rivers at the close of May, the logs are floated down to their destination, and finally shipped from Balize in Honduras to Europe.

## PLATE LXXV.

*A branch in flower of the natural size. a. The capsule. b. The seed.*

# ORANGE TREE.

(L'Oranger, Fr.)

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*Natural Order*, Aurantiace.e. (Cotton.) *Linnæan Classification*, Polyandria, Monogynia.

CITRUS.* (Linn.)

*Calyx* 5-cleft, persistent. *Petals* five or more, oblong, spreading. *Stamens*, filaments about twenty to sixty, forming a cylinder and disposed in several sets. *Germ* superior, style cylindrical with a capitate stigma. *Berry* many-celled, enclosed by a fleshy glandular rind, the cells nine to eighteen, separated from each other by membranous envelopes; pulp watery, contained in numerous utricular vesicles. *Seeds* oblong, attached to the inner angle of the cell; albumen none. *Embryo* straight, the seed-leaves or cotyledons large and thick, often more than two.

Trees or shrubs of tropical or mild climates, chiefly indigenous to Eastern Asia, India, and China, with a single species in Guiana, (Tropical America.) Leaves alternate, solitary, articulated to the summit of a petiole which is usually margined or alated: the axils of the leaves, in the uncultivated state, usually produce simple spines.

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* Derived from κιτρια, the *Lemon*, and κιτριον, the *Citron*, which among the Greeks and Romans included also the *Cedar* or some similar tree, which they probably associated from the fragrance of its wood.

Citrus vulgaris.

*Wild Orange Tree.* *Orange Sauvage.*

# WILD ORANGE TREE.

Citrus vulgaris, (Risso.) *Petiolis alatis, foliis ellipticis acutis crenulatis, floribus icosandris, fructuum globosorum cortice tenui scabroso, pulpa acri amara.*—Decand., Prod. i. p. 539. Risso, Annal. Mus., vol. xx. p. 190.

Citrus *Aurantium Indicum.*—Gall., citr., p. 122.

Citrus *Bigarradia.*—Nouv. Duhamel, vol. vii. p. 99.

*Bigarade* of the French, or Bitter Orange.

Citrus *spinosissima?*—Meyer, Essequib., p. 247.

*Aurantium vulgare, acre; primum.*—Farrarius, Hesper., p. 374.

*Aurantium sylvestre, medulla acri.*—Tournefort's Institutes, p. 620.

*Malus Aurantia sylvestris.*—J. Bauhin, Hist., vol. i. p. 99.

From the relation of William Bartram, in his "Travels up the St. John's in East Florida, in the year 1774," it is evident that the Orange Tree is abundantly indigenous to the banks of that stream. Groves of Orange Trees, of large dimensions, loaded with their golden fruit, spread themselves before the traveller in the greatest profusion, and he might readily imagine himself transported in reality to the gardens of the Hesperides. As the Orange was there found an established denizen of the country, previous to all European settlement, we must of course conclude it to be, like the Banana and some other tropical productions, a native alike of both the Old and the New Continent. These forests of the Wild Orange Trees are frequent in East Florida as far north as the latitude of 28°. According to the observations of the late Mr. Croom, "they are rarely found north of latitude 29° 30', although there is a small grove near the Alligator Pond, which is somewhat north of latitude 30°." The fruit (according to Torrey and Gray) is known by the name of the Bitter-Sweet Orange.

To show the extent of these groves, in a notice of the town of New Smyrna, Bartram observes, "I was there about ten years

ago, (1764,) when the surveyer ran the lines of the colony, where there was neither habitation nor cleared field. It was then a famous Orange grove, the upper or south promontory of a ridge nearly half a mile wide, and stretching north about forty miles," &c. All this was *one entire Orange grove*, with Live Oaks, Magnolias, Palms, Red Bays, and others. (BARTRAM'S *Travels*, in a note to page 144.) On page 253, he also remarks, "I have often been affected with extreme regret at beholding the destruction and devastation which has been committed or indiscreetly exercised on those extensive, fruitful Orange groves, on the banks of St. Juan, by the new planters under the British government, some hundred acres of which, at a single plantation, have been entirely destroyed, to make room for the Indigo, Cotton, Corn," &c.

In the forests of Essequibo there appears to be a variety of this species of Orange, equally indigenous with the present; it is also wild about Vera Cruz, and near Mexico and Panuco,* and is indigenous in Porto Rico, Barbadoes, and the Bermudas, as well as in Brazil, and St. Jago of the Cape Verde Islands. Hughes also speaks of it in his time as being natural in the woods at Orange Bay in Jamaica, both the sweet and sour kinds, in great plenty. The specimens which I have seen brought from East Florida, by Mr. James Reed, are evidently referable to the present species, the Orange of India, though we have not had the satisfaction of seeing any specimen of the fruit; but, according to Bartram, the taste is sufficiently grateful, as he made use of it to season and add a relish to his animal food.

India is the native country of the Orange now so generally naturalized in the South of Europe, particularly along the coast of the Mediterranean. About Nice all the known species and varieties of this grateful fruit are cultivated in perfection. The Orange has also been supposed to be a native of the Hesperides

* PHILLIPS, in Hakluyt's Voyages, l. c.

or Canary Islands, and its fruit to be the golden apples which the daughters of Hesperus caused to be so strictly guarded by a watchful dragon. Under this idea, Ventenat changed the name of the natural order to which it belongs from Aurantiæ to Hesperidæ, an innovation more poetic than philosophical, and which has not been adopted.

The Lemon appears to have been the first of the genus which was introduced into Europe. Theophrastus, and after him Pliny, speak of a fruit known under the name of the *Apple of Persia* or of *Media*. Virgil, in his Georgics, extols the happy effects supposed to be produced by the use of the Apple of Media:—

"Animos et olentia Medi
Ora fovent illo, et senibus medicantur anhelis."
GEORG., lib. ii.

The Phocians are supposed to have been the first who planted this tree on the coast of the Mediterranean when they founded the city of Marseilles. In the eleventh century the Seville Orange was already spread through all the islands of the Mediterranean, and in the thirteenth century it was established about Nice. The species of Orange of which we are now treating, (the Bigaradier of the French,) appears to have been introduced from India into Europe by the Arabs, who cultivate it in all the countries subjected to their dominion. The Citron passed from Egypt into Europe in the time of the Crusades. According to the testimony of one of the Arabian writers, it was from Phenicia that the golden Orange was conveyed to the gardens of Seville. No traveller has in a positive manner established the native country of the true Orange; and it is nearly alike whether we should attribute it to Japan or the islands of the Pacific, more particularly the Philippines.

The duration of the Orange Tree, in the countries where it is indigenous, is no doubt very great. Many of those cultivated in the Maritime Alps of France are more than 250 years of age;

and, according to Risso, a wind from the S.S.E. in February, 1807, overturned in the commune of Esa Citron Trees which were more than 500 years old. Tamara and Ferrarius both describe an Orange Tree, planted in the year 1200 by Saint Dominic, in the garden of the convent of Saint Sabine in Rome, which is said still to exist.

The Orange is considered the most beautiful tree of Europe; the majesty and regularity of its form, the brilliant and unfading green of its graceful foliage, its white and fragrant flowers and splendid fruit, strike the beholder with admiration. Its beauty is not transient like that of ordinary orchard trees, but nearly throughout the year it is luxuriantly adorned with flowers and fruit. The cultivated Orange attains the height of twenty-five to thirty feet, with a circumference of two or three feet. The wild Orange of Florida, however, acquires a greater height than those which I have observed in cultivation in the Azores. The wood is compact, close, and fine-grained, very hard, and susceptible of a fine polish, slightly veined, and suitable for inlaid work. The wood of the Wild or Bitter Orange is preferred by chemists because of its superior density. The leaves have also a more powerful odor: distilled they give a bitter aromatic water, known in Languedoc by the name of *l'Eau de Naples*. By the same operation is also obtained an essential oil of a better quality than that from the leaves of the true Orange. The *Orange-Flower Water*, a well-known perfume, is obtained also from this species. It is praised for its cordial virtues, and as a cephalic, vermifuge, and antispasmodic. The fruit is made great use of for seasoning fish and meats, and to give a relish to various sauces. A wine is also made from the juice of the sweet orange, mixed with the extract of the peel fermented, which keeps a long time, and when old acquires the taste of the Malvoisie of Madeira.

The smell of the Orange flower is almost universally esteemed: it is salutary and refreshing, and is unrivalled for its excellent perfume. The juice of the fruit is equally grateful: it allays

heat and thirst, and, by promoting various excretions, proves of considerable use in febrile and inflammatory diseases. The outer yellow rind of the Seville orange is a grateful aromatic bitter, tending to improve the appetite, and it is employed in making the well-known conserve, marmalade.

In the Azores, the cultivation of the Orange as an article of commerce, is of great importance to the inhabitants, and every means are employed for its success. The trees in Fayal are defended from the severe sea-breezes by very high stone walls, and plantations of young trees are defended for several years by rows of the Faya (*Myrica Faya*) planted between them, and, though the trees there rarely attain a greater height than twenty or twenty-five feet, they spread out many large branches; and sometimes a single tree has produced as many as 6000 Oranges. The best kind brought to the European markets are those from the island of St. Michael. They have an even shining rind with a deliciously-sweet and agreeable pulp.

As I have already remarked, a specimen of the Wild Orange from Florida is in no way distinguishable from the *Citrus vulgaris* of Asia: it has the same elliptic leaves, with alated peduncles, small axillary spines, and axillary and terminal white flowers on short peduncles, with twenty stamens.

PLATE LXXVI.

*A branch of the natural size, with the fruit.*

# BALSAM TREE.

*Natural Order*, GUTTIFERÆ, (JUSS.) *Linnæan Classification*, POLYANDRIA, MONOGYNIA.

CLUSIA.* (LINN.)

*Calyx* of four to eight sepals imbricated and colored. *Corolla* of four to eight petals. *Stamens* numerous. *Style* none. *Stigma* radiately peltate. Flowers commonly polygamous, with the fertile ovary surrounded by a short thick nectary. *Capsule* fleshy, coriaceous, 5 to 12-valved, opening at the apex; placentæ triangular, united into a central column, each one attached to the introflected valvules. *Seeds* terete; cotyledons separable.

Parasitical trees of Tropical America, with opposite coriaceous entire leaves without stipules.

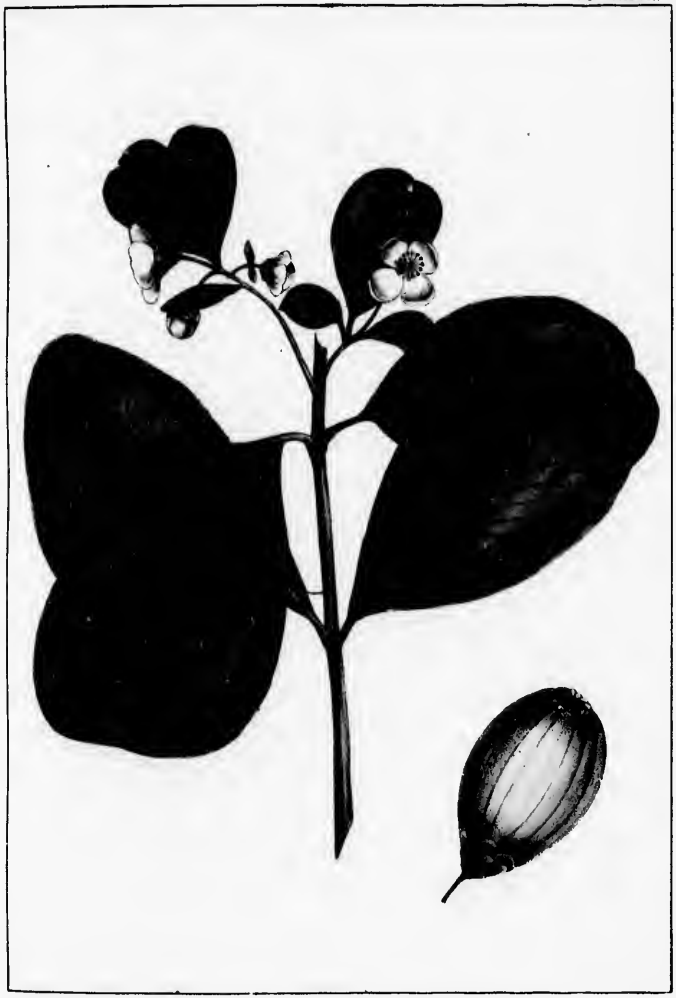
## YELLOW-FLOWERED BALSAM TREE.

CLUSIA FLAVA. *Floribus polygamis, calyce polyphyllo, corolla tetrapetala flava, staminibus numerosis brevibus, stigmatibus circiter* 12, *foliis obovatis obtusis aliquando emarginatis, breviter petiolatis striatis.*—DECAND., Prod., vol. i. p. 559.

CLUSIA FLAVA. *Foliis ovatis, corollis tetrapetalis.*—LINN., Syst. Veg., vol. iv. p. 328. JACQ., Stirp. Amer., p. 272, t. 167.

CLUSIA *arborea. Foliis crassis, nitidis, obovato-subrotundis; floribus solitariis.*—BROWNE, Jam., p. 236.

* Named in honor of Charles de l'Ecluse, a celebrated botanist of the sixteenth century.



Clusia flava.

*Yellow flowered Balsam Tree.* *Clusier jaune.*

*Terebinthus folio singulari, non alato, rotundo succulento; flore tetrapetalo, pallide luteo, fructu majore, monopyreno.*—Sloane, Jam., p. 167; Hist., vol. i. p. 91. t. 200, f. 1.

This singular and splendid tree is a native of Jamaica, and Cayenne in South America, where it is found among rocks on the declivities of mountains. We have now also to record it as a native of Key West in Florida, where it has recently been found, with so many other tropical productions, by Dr. Blodgett. It grows to the height of about twenty feet or upward, and, like other kindred species of the genus, is parasitic on the trunk or limbs of other trees,—a habit supposed to be occasioned by birds accidentally scattering the viscid seeds, which take root like those of the Missletoe; when, having obtained a considerable size, the roots creep along the surface of the tree in quest of nourishment and support, penetrating into any decayed cavity of the supporting trunk, and finally reaching the ground though at forty feet distance, where now, at length permanently fixed, it becomes a large and independent tree. A viscid or resinous balsamic whitish juice exudes from every part of the tree when cut, which becomes red or brownish when exposed to the air, and hardens like other gums or colophony. As yet this substance has been applied to no useful purpose more than as a dressing to the sores of horses, and by the Indians is mixed with tallow to pay their boats to prevent leakage.

The leaves of this plant, as well as those of *C. rosea* and *C. alba*, are very remarkable in their form and appearance, being very smooth and of a thick leathery consistence, wedge-shaped or inversely oval, five or six inches long by about four wide, entire or slightly repand at the summit, which is rounded; they are insensibly narrowed downward to a thick petiole about half an inch in length, and marked beneath with many transverse ascending veins which are scarcely perceptible at the surface, all inosculating together near the border. The flowers are shortly pedunculate, axillary and terminal, solitary, or by threes

on the same peduncle. The calyx is almost quadrangular, composed of sixteen sepals, disposed in four ranks; they are somewhat rounded and concave, the inner series gradually becoming larger. The corolla is pale yellow, of four oval petals somewhat unguiculated, very thick, two of them larger than the others. Stamens very numerous, on short thick filaments, nearly in four rows round the germ, with the anthers distinctly two-lobed. The germ is very small, with a thick, twelve-rayed, almost capitate, stigma, with four lateral appendages. The capsule with twelve cells and twelve thick valves containing numerous oblong seeds, enveloped in a soft pulp and attached to a large oblong twelve-furrowed placenta or receptacle. The fruit is about the size of a fig, with something of its form; and hence it is known to the negroes by the name of the *Wild Fig.* (Macfadyen.)

## PLATE LXXVII.

*A small branch with the leaves reduced to about one-half their natural size.*

Amyris Floridan.

*Florida Torch Wood.* *Balsamier des Florides*

# TORCH-WOOD.

(Balsamier, Fr.)

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*Natural Order*, Amyridaceæ, (R. Brown.) *Linnæan Classification*, Octandria, Monogynia.

AMYRIS.* (Linn.)

*Calyx* 4-toothed, persistent. *Petals* four, oblong, spreading, imbricated in the bud. *Stamens* eight, shorter than the petals. *Stigma* sessile, obtuse, and indistinct. *Drupe* 1-seeded, with a chartaceous nut.

Trees or shrubs of Tropical America, with opposite compound leaves, mostly of a single pair, or trifoliate pinnate; the leaflets as well as the drupe filled with pellucid aromatic glands. Flowers white, in terminal, trichotomous panicles.

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## FLORIDA TORCH-WOOD.

Amyris Floridana. *Foliis breri-petiolatis, foliolis* 1-*jugis cum impari ovatis integerrimis obtusiusculis subacuminatis nitidis, paniculis terminalibus abbreviatis, drupa subglobosa basi angustata.*

Amyris *Floridana.*—Nutt., in Sillim. Journ., vol. v. p. 294. Decand., Prod., ii. p. 81. Torrey and Gray, Flora of North Amer., i. p. 221.

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* The name is derived from *μυρρα, Myrrh*, in allusion to the gum or resin afforded by different species of the genus.

This plant forms a small evergreen tree, about fifteen to twenty feet high, and, like most of the genus, affects the borders of the sea. Major Ware first found this species in some part of East Florida, no doubt near the coast; and fine specimens have been collected on the shores of Key West, by Dr. Blodgett.

The general appearance of this elegant tree, and its lucid leaves, almost remind one of the myrtle; the leaves, always growing by threes, are equally filled with aromatic, oily reservoirs, looking like pellucid dots when viewing the leaf as held up to the light. They are opposite, on petioles of about half an inch in length; the petiole of the central leaflet of the three is also about the same extent; the leaflets are short, about one to one and a half inches long by an inch in width, perfectly entire, of a broad-ovate form, shortly acuminate, with the point mostly obtuse, but slightly apiculated; beneath dull and paler, above reticulately veined and shining. The flowers are small and yellowish white, in terminal, shortish, oppositely-branched panicles. The calyx is minute, and four-toothed. The petals four, oval-oblong, concave, spreading, and glandular beneath. Stamens eight, shorter than the petals, with long, white, oblong-linear two-celled anthers, which open lengthways. The germ is ovate, with a small, sessile, concave stigma. The berry is black and glaucous, with a bloom, narrowed below, about the size of a grain of black pepper, and covered with an agreeably-aromatic, oily pulp.

This species is considerably allied to *Amyris maritima*, which produces a white, hard, and odoriferous wood; but in that plant the leaves are really obtuse, almost round, not acuminate, decidedly crenate on the margin, and of a much thicker consistence.

The wood of this species is yellowish white, close-grained, and capable of receiving a high polish. The leaves and bark of several of the West India species of this genus yield a fine

balsamic juice, wholly resembling that of the Gilead balsam. By distillation, the wood would also yield a very grateful perfume.

One of the Oriental species formerly included in this genus has been long familiar: namely the *A. Gileadensis*, which yields the balsam of Mecca or of Gilead, the most fragrant and pleasant of balsams. From the *A. Elemifera* of Brazil is obtained the gum Elemi. The *A. Ambrosiaca* of Guiana (now referred to *Icica* of Aublet) becomes a tree, and yields a very odoriferous balsam from the trunk and branches, which is used in dysentery, and burned in houses and churches as a perfume. It also produces the resin of Coumia.

## PLATE LXXVIII.

*A branch of the natural size. a. The flower. b. The fruit.*

# BURSERA.

(Jacquin. Gomart, Fr.)

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*Natural Order*, Burseraceæ, (Kunth.) *Linnæan Classification*, Polygamia, Dioecia.

Flowers Polygamous. Male. — *Calyx* small, 3 to 5-parted, with obtuse lobes. *Petals* three to five, spreading, with a valvular æstivation. *Stamina* six to ten; annular disk, with six to eight crenulations. Fertile Flowers, with the calyx 3-parted. *Petals* three. *Stamens* six. *Ovary* ovate, 3-celled. *Style* short, with a capitate, obtuse, 3-lobed stigma. *Drupe* oblong, with three nuts; the bark succulent and trivalvular; two of the nuts abortive; the fertile one fleshy, bearing two ovules, and perfecting only one seed. *Seed* pendulous, without albumen; cotyledons foliaceous, with wrinkled folds, the radicle straight and superior.

Tropical American balsam-bearing trees, with unequally-pinnated and sometimes simple articulated leaves, with small flowers in axillary racemose panicles.

Named after Joachim Burser, Professor of Botany at Sara, in Naples.

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## WEST INDIAN BIRCH TREE.

Bursera gummifera. *Foliis deciduis sapius impari-pinnatis, foliolis ovatis acutis membranaceis, racemis axillaribus.*—Decand., Prod., vol. ii. p. 78. Jacquin, Am., p. 94, t. 65. Swartz, Obs., p. 130.

Terebinthus *major betulæ cortice, fructu triangulari.*—Sloane, Jam., t. 199.

Bursera Gummifera.

*West Indian Birch tree* *Giraart d. Amerique*

TEREBINTHUS *foliis cordato-ovatis pinnatis, cortice lævi rufescente, floribus masculis spicatis.*—BROWNE, Jam., p. 345.

THE West Indian or Jamaica Birch becomes a large, lofty, and graceful tree, with an upright, smooth, round trunk of three to four feet in diameter, having an even, thin, membranaceous brown or grayish bark, peeling off in shreds like the European Birch; but in other respects it bears not the slightest relation to that tree. It produces a fine, spreading, much-branched summit, full of elegant, feathery leaves, almost like those of the Ailanthus; and, though an exclusive native of the tropics, it annually sheds its leaves in the winter, flowering and renewing its foliage in the months of March and April. It is common in most of the West India Islands, as well as in the adjoining continent, and is described as being common on Key West, by our friend Dr. Blodgett. It is known to the French inhabitants by the name of *Gommier*, from the circumstance of its affording resin; by the Spaniards it is called *Almicigo* or Mastic Tree, each one comparing it with something growing in their native country.

All parts of the plant abound with a glutinous, balsamic juice, having the odor of turpentine, which soon thickens in the air, and forms a transparent gum-resin of a dark-green color, bearing some resemblance to mastic, but with an unpleasant alliaceous smell. It is soluble in alcohol, and may be employed, like mastic, as a transparent varnish. It might also be substituted in the form of pills, for copaiba and other nauseous balsams, in diseased discharges from the mucous membranes. Jacquin observes that the bark of the root is often exported to Europe in place of that of the Simaruba, and by some it is said to possess, in fact, the same properties as Quassia.

As a timber tree, the Bursera is considered of little value, the wood being white, soft, and brittle, and it is seldom put to any use but as fuel.

The leaves are alternate, and unequally pinnated; rather long-petiolate, composed each of three, five, seven, or even sometimes nine opposite leaflets, which are petiolated, oval, acuminate, rounded at base, and somewhat cordate, entire, at length smooth on both sides, even, and a little shining above, (an inch and a half to two inches wide, and about three inches long, when fully expanded after the flowering period.) The flowers are small, whitish, scentless, growing in axillary, clustered-flowered racemes or panicles, toward the summits of the branches. The drupe is about the size of a hazel-nut, greenish, tinted with brownish purple when ripe, resinous, fragrant, with a succulent bark, appearing somewhat three-lobed, three-celled, and three-valved, with only one seed usually coming to perfection, the nuts of the two other cells being abortive: the nuts are very white, a little compressed, each containing one kernel.

Two other species of this genus are described by Decandolle, —*B. acuminata*, from St. Domingo, of which but little is known, and the *B. simplicifolia*, which is probably not a congener, having a single nut, exactly three-sided, with the angles partly salient. This bears simple leaves, and forms a tree only about fifteen feet in height.

The *Bursera paniculata*, (now *Colophonia Mauritiana*,) the Bois de Colophone of the Isle of France, gives out, from the slightest wound in the bark, a copious flow of limpid oil with a pungent, turpentine odor, which soon congeals to the consistence of butter, assuming the appearance of camphor.

## PLATE LXXIX.

*A branch of the natural size. a. The drupe. b. The nut. c. The male flower. d. The female flower. e. A small fruiting branch.*

# SUMACH.

*Natural Order*, ANACARDIACEÆ, (R. BROWN.) *Linnæan Classification*, PENTANDRIA, TRIGYNIA.

## RHUS.* (LINN.)

Flowers POLYGAMOUS OR BISEXUAL.—*Calyx* small, 5-parted, persistent. *Petals* five, small, ovate-spreading, imbricated in æstivation. *Stamens* five, equal, free. *Torus* an orbicular disk. *Ovary* ovate or globose, 1-celled; ovule solitary. *Styles* three, distinct or combined. *Fruit* almost a dry drupe. The *Nut* bony, 1-celled, 1-seeded, even or grooved. *Seed* (by abortion) solitary, attached to the extremity of a basilar funicle. *Embryo* inverted; cotyledons foliaceous; radicle curved and opposite to the hylum.

Shrubs or trees of various countries and climates, but more abundant in those which are mild. Leaves alternate, compound, ternate or pinnate. Panicles axillary and terminal, the flowers small, greenish, and inconspicuous.

§ METOPIUM. *Drupe ovate-oblong, dry and smooth. nut chartaceous. Seed sulcate.*

* The name is derived from the Celtic word *rhudd*, signifying red, from the prevailing color of the fruit. The name *Sumach* is from the Arabic name *Simáq*.

# CORAL SUMACH.

Rhus metopium. *Foliis pinnatis 2–3-jugis cum impari glaberrimis, foliolis petiolatis ovatis integerrimis.*

Rhus metopium.—Linn., Amœn. Acad., vol. v. p. 395. Decand., Prod., vol. ii. p. 67.

Metopium *foliis subrotundis pinnato-quinatis, racemis alaribus.*—Browne, Jamaic., p. 177, tab. 13, fig. 3.

*Terebinthus maxima, pinnis pauioribus majoribus atque rotundioribus, fructu racemoso sparso.*—Sloane, Jam., 167. Hist., vol. ii. p. 90, t. 199, fig. 3. Raii, Dendrol., p. 51.

*Borbonia fructu coralline, flore pentapetalo.*—Plumier, Ic. 61.

This stately species of Sumach becomes a tree of fifteen to twenty or more feet in height, and in Jamaica affects the calcareous hills. It is also a native of Cuba and Key West, (Dr. Blodgett.) The wood is hard, and, when large enough, suitable for furniture.

Like several other native species of the genus, it is to some individuals poisonous to the touch. This and the Mountain Sumach are called, in St. Domingo, "Mountain Manchineel," from the poisonous qualities of the juice they exude. The branches are erect and smooth. The leaves come out at the ends of the branches, and are unequally pinnate, usually two pair and an odd one, but sometimes three pair and a terminal leaflet. The leaves are very smooth and coriaceous, quite entire, upon long petioles; the leaflets are usually broad-ovate and acuminate, on longish, partial petioles, the upper pair unequal at the base; sometimes they are of an elliptic form, and occasionally obtuse and rounded at the extremity. The flowers are dioecious; in terminal, loose, open, spreading panicles, which are about the length of the leaves; the bractes are very small. The calyx is five-parted, the segments ovate and dilated with membranous margins. Petals five, ovate, yellowish white,

Rhus Metopium

*Coral Sumach* *Sumach - Retop*

covered with dark longitudinal lines. Stamens five, not exserted. In the fertile flower, the stigma appears to be very small and unequally three-lobed. The berries are oblong, smooth, somewhat oblique, scarlet, and as large as peas; the nut is thin and chartaceous.

A transparent gum, in small quantities, exudes spontaneously from the pedunceles of the flowers, which probably is of the nature of varnish.

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Among the useful and remarkable species of this extensive genus may be mentioned the Elm-Leaved Sumach, (*Rhus Coriaria,*) which is so far harmless as occasionally to be employed for culinary purposes, the seeds being commonly used, in Aleppo, at meals to provoke an appetite. The leaves and seeds are also used in medicine as astringent and styptic applications. From time immemorial, it has been employed, like oak bark, for tanning leather, and that of Turkey is chiefly tanned with this plant. The pulp of the drupes of several species affords an agreeable acid, similar to that of wood sorrel, either the oxalic or tartaric.

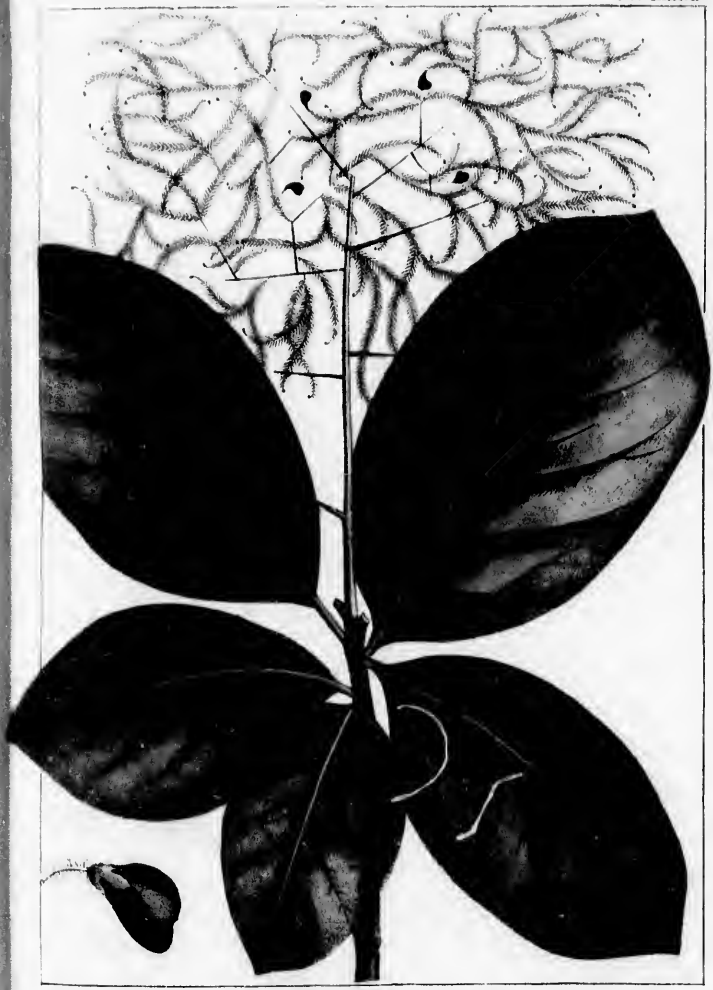
The *Rhus vernix* affords the Japan varnish, which oozes from incisions made in the tree, and grows thick and black when exposed to the air. It is so transparent, that, when laid pure upon boxes or furniture, every vein of the wood may be clearly seen. With it, the Japanese varnish most of their household furniture made of wood. The milky juice of the plant stains linen a dark brown; the whole shrub, like our Poison Ash, (*R. venenata,*) to which it is nearly allied, is in a high degree poisonous; and the poison is communicated by touching or smelling any part of it. Inflammations appear on the skin in large blotches, succeeded by pustules, which rise in the inflamed parts and fill with watery matter, attended with burning and itching, which continues for several days, after which the in-

flammation subsides. The extremities and glandular parts of the body are those which are most affected. Our *Rhus radicans* and *R. toxicodendron* (Poison Vines) operate nearly in the same way, though in a less degree than the Poison Ash or *Rhus vernix*. Many persons, however, can approach and handle these deleterious plants with impunity. One of the most dangerous species in America is the *Rhus pumila* of Michaux, a native of North Carolina. Mr. Lyons, a well-known and assiduous collector of rare and ornamental plants, suffered extremely from its venom, by merely collecting the seeds; it produced a general fever, and affected the use of his limbs for several years.

## PLATE LXXX.

*A branch of the natural size. a. The male flowers. b. A flower enlarged.*

*La*



**Cotinus Americanus.**

*Large leaved Cotinus.* *Sumac Fustet d'Amerique.*

# COTINUS, OR VENETIAN SUMACH.

*Natural Order*, ANACARDIACEÆ, (R. BROWN.) *Linnæan Classification*, PENTANDRIA, TRIGYNIA.

COTINUS, (TOURN.) RHUS, (LINN.)

*Flowers* similar to those of RHUS, but hermaphrodite, and a great part of them abortive, the barren pedicels at length elongated and clothed with articulated hairs. *Fruit* a dry, cartilaginous, oblique drupe, without any pulp, 1-celled. *Seed* solitary.

Small trees with alternate, simple, ovate or roundish, entire leaves; the flowers in loose, diffuse, slender, terminal panicles.

## LARGE-LEAVED
OR
## AMERICAN COTINUS.

COTINUS AMERICANUS. *Foliis rhomboïdeo-ovatis subtus ad nervos pubescentibus, paniculis parvis laxis.*

RHUS *Cotinoides*.—NUTT., MSS. in Herb. Acad. Phila.

RHUS *Cotinus?*—TORREY and GRAY, Flora N. Am., vol. i. p. 216.

IN the autumn of 1819, during a tour made into the interior of the Arkansas Territory, I discovered this interesting species of Cotinus on the high, broken, calcareous rocky banks of the Grand River, a large tributary of the Arkansas, at a place then

known to voyagers by the name of the "Eagle's Nest." In this rocky situation, it did not rise beyond the height of a shrub, and had a yellow, close-grained, fragrant wood.

The branches are smooth and gray, the younger ones brown, and rough with numerous vestiges of former petioles. Leaves three to four inches long by two to two and a half wide, the lower ones rhombic-ovate and obtuse, the upper ones obovate, but still somewhat narrowed at the extremity, strongly veined beneath, the veins pubescent even in the oldest leaves. Panicle less compound than in the common species, the hairs of the infertile peduncles more straggling, no infertile rudiments of flowers on the adult peduncles. Segments of the calyx linear-oblong. Drupe dry, rugose, brown, oblique, partly reniform, two-celled, one-seeded, the smaller lobe of the carpel empty. The whole plant possesses the same aromatic odor as the true Cotinus. It is, no doubt, a hardy plant, and deserving of cultivation; but, as it has not been collected since I observed it, it would appear to be scarce and very local.

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Another very distinct species of this genus also exists in Nepaul. There is a specimen in the Herbarium of the Academy of Natural Sciences in Philadelphia, marked *Rhus velutinum*, by Dr. Wallich. It may be called

COTINUS VELUTINUS. The leaves are oblong-elliptic or subovate, pubescent, beneath softly villous; the calyx and young peduncles are also hairy.

The *Cotinus* of Europe, or Venetian Sumac, forms a tufted small tree from six to fifteen feet high, and is indigenous to the South of France, Italy, Switzerland, Austria, Siberia, &c. It has an elegant foliage, an agreeable citron odor; and the singular aspect of its woolly panicles, resembling almost a fixed purple cloud, renders it well worthy of cultivation for ornament. The wood

is yellow and green, and is employed by musical-instrument makers, ebonists, turners, &c. It serves likewise for dyeing cloth a coffee-brown, and in preparing morocco leather. The leaves and branches also, in common with the bark of several species of Sumach, answer for tanning. The figure in plate 10 of the Atlas to Pallas's Travels very much resembles our plant, and is remarkable for the oblong form of its leaves. This variety grew on the steppes of Kouman, near the borders of the Caspian.

## PLATE LXXXI.

*A branch of the natural size, in seed. a. The fruit.*

# STYPHONIA.*

(NUTT.)

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*Natural Order*, ANACARDIACEÆ. *Linnæan Classification*, PENTANDRIA, TRIGYNIA.

*Sepals* (or calyx-leaves) seven to nine, colored, concave, with scarious margins, imbricated in several series, persistent, passing into the bracteoles. *Petals* five, oblong, subunguiculate, similar with the sepals, pubescent at base, inserted under the margin of the disk. *Stamens* five to seven. *Style* short; stigma minute, 3-lobed. *Fruit* a dry compressed drupe; the pulp scanty, very acid and astringent. *Nut* compressed, bony, 1-celled. *Seed* solitary, suspended from a funiculus arising from the base of the cell.

These are low and much-branched, submaritime evergreen trees of Upper California. Leaves simple, alternate, thick and coriaceous. Flowers polygamous, sessile, in terminal contracted panicles.

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## ENTIRE-LEAVED STYPHONIA.

STYPHONIA INTEGRIFOLIA. *Foliis ovatibus integris utrinque obtusis brevi-petiolatis.*

STYPHONIA *integrifolia*. Leaves oval, very obtuse at either end, entire, on short petioles.—NUTT., in TORR. and GRAY, Flora N. Am., vol. i. p. 220.

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* From στυφω, to be *astringent*. In allusion to its qualities.

Stryphonia Integrifolia.

*Entire Leaved Stryphonia.* *Stryphonie a Feuilles Entieres*

This is an unsightly tree, with a stem about the thickness of a man's arm, branching in a wide and straggling manner, forming impervious thickets along the margins of cliffs and steep banks near the sea, around St. Barbara and St. Diego, in Upper California. These thickets, filled exclusively with this plant and the following, at a distance resemble our scrub-oak: they are equally indicative of a barren soil, and are almost impervious, though not extensive.

The older stems are smooth and gray, though the young leaves and branches are minutely pubescent. The branches are brown. The leaves are an inch or more long, three times the length of the petioles, and rather prominently veined beneath. The flowers are disposed in terminal, few-flowered, sessile clusters, upon the short branches of the panicle. The sepals and petals are rose-red. Drupes the size of a pea, hirsute, dark red. The fruit is similar, in most respects, to that of the section *Sumac* in the genus *Rhus*, though the inflorescence somewhat resembles that of *Lobadium*, (the fragrant Sumac:) it differs, however, from both, in the gradual transition of the bractes into petals.

To this genus, I suggested that the *Rhus atra* of Forster, from New Caledonia, might possibly appertain; but I have seen since a flowering specimen of that rare plant, in the collections sent home by the American Exploring Expedition, and find it to be more allied to Lithrea. The *Rhus mollis* of Humboldt, Bonpland, and Kunth, appears, judging merely from the figure and diagnostic character, to belong probably to the present genus.

We know of no uses to which this plant has been applied; but we observed that there exudes from the bark, in small quantities, a very astringent-tasted gum-resin.

## PLATE LXXXII.

*A branch of the natural size. a. The berries.*

# SERRATE-LEAVED STYPHONIA.

STYPHONIA SERRATA. Leaves oval or ovate, on very short petioles, sharply repand-serrate.—NUTT., in TORR. and GR'A, Flora, vol. i. p. 220.

THIS species grew commonly with the preceding, differing from it merely in the leaves, which are more ovate, and when young being sharply serrated with small mucronate notches; the older leaves are obscurely repand-serrate.

# PRICKLY ASH,

OR

# TOOTH-ACHE TREE.

(Clavalier, Fr.)

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*Natural Order,* Zanthoxyleæ, (Ad. Jussieu.) *Linnæan Classification,* Dioecia, Pentandria.

ZANTHOXYLUM. (Linn.)

Dioecious. *Sepals* small, three to nine. *Petals* longer than the sepals, or none. *Stamens* as many in number as the sepals, (or fewer,) opposite to and mostly extended out beyond them. *Ovaries* one to five, elevated on a round or cylindric torus, (or place of insertion,) distinct, with two suspended ovules. *Carpels* crustaceous, sessile or stipitate on the torus; 2-valved, 1 to 2-seeded. *Seeds* black and shining, globose, hemispherical when in pairs.

The plants of this genus are trees or shrubs, mostly of warm climates, usually with prickles on the branches, petioles, and often on the midrib of the leaves. Flowers small, greenish or whitish. Leaves pinnate, rarely trifoliate, marked with diaphanous aromatic glands, and, as well as the bark, aromatic and pungent to the taste. The timber of several trees of this genus is valuable, being very hard and durable.

§ II. *Sepals, petals, and stamens, four or five; ovaries usually one to three. Styles short.*—Fagara, (Jacquin,) and Ochroxylum, (Schreber.)

# CAROLINA PRICKLY-ASH.

ZANTHOXYLUM CAROLINIANUM. *Ramis petiolisque plerisque aculeatis, aculeis stipularibus oppositis, fol[illegible] pinnatis 4–6-jugis, glaberrimis, foliolis orato-lan[illegible]tis inæquilateralis subfalcatis petiolulatis crenato-serrulatis lucidis, floribus paniculatis; terminalibus sepalis minutis, capsulis ternis sessilibus.*

ZANTHOXYLUM *Carolinianum.*—LAMARCK'S Dict., vol. ii. pp. 39, 40. CATESBY'S Carol., vol. i. tab. 26. TORREY and GRAY, Flor. Am., vol. i. p. 214.

Z. *tricarpum.*—MICH., Flor. Bor. Am., vol. ii. p. 235. PURSH, vol. i. p. 210. DECAND., Prod., vol. i. p. 726.

Z. *fraxinifolium.*—WALT., Flora Carolin., p. 243.

THIS remarkable tree appears to be first met with in the State of South Carolina, on Sullivan's Island,* and in Georgia.† It becomes still more abundant in the forests of East Florida, particularly on the luxuriant banks of the great river St. John's, where my ancient friend Wm. Bartram met with it in every direction in those umbrageous solitudes. In Carolina it appears to be confined entirely to the sea-board, as neither Mr. Elliott nor myself had ever seen it in the interior of that State. It attains the height of about thirty to forty feet, with a proportionate diameter.

In 1774, William Bartram thus describes it as it appeared on the banks of the St. John's:—"The *Zanthoxylum Clava Herculis* also grows here. It is a beautiful spreading tree, and much like a well-grown Apple Tree."‡ It is, however, powerfully armed with prickles and spines, with which the leaves and branches are thickly beset. Stout stems, as thick as one's arm, still present huge pointed tubercles, once small thorns, now become large pro-

* Mr. James Reed. † Dr. Baldwin.

‡ Travels in Florida, &c., p. 88.

*Can*

**Xanthoxylum Carolinianum.**

*Carolina Prickly-Ash.* *Clavalier de la Coroline.*

jections, giving the stock all or more than the ordinary attributes of the club of Hercules. The wood, like that of the West Indian species, the true *Z. Clava Hercutis*, is yellow and solid, and hence the generic name of *Xanthoxylum*, formed of two Greek words, signifying *yellow wood*. The West India plant is considered a valuable timber tree, and made use of in house-building: it attains the height of about twenty feet.

As a medicinal plant, the bark of the present species is considered a powerful stimulant, sudorific, diuretic, and febrifuge. Bartram mentions that it is bitter to the taste, slightly odorous, coloring the saliva yellow, exciting salivation when chewed, and that it had been employed with success in rheumatism, paralysis of the tongue, &c. Dr. Gillespie found the West India plant, in tincture, to be a good febrifuge; and Manguet states that the decoction is anti-syphilitic. The analysis of Chevalier and Pelletier gives a peculiar crystalline substance which they call *Xanthopicrite*, a yellow coloring-matter which appears to be the source of the bitter taste of this bark, a red coloring-matter, and some salts.

The leaves in the present species are very smooth, pinnate in about five or at most six pair and an odd one; each pair of leaves send off, in common, an opposite pair of long, flat thorns; the leaflets are ovate-lanceolate, curved, and acuminate, slightly serrate; the sides from the midrib very unequal, the lower side of the leaf being scarcely half as wide as the upper side. The flowers, rather numerous but not conspicuous, are produced in a clustered, terminal panicle, with a minute calyx, but with rather large, ovate, obtuse, greenish-white petals. The carpels are said, by Michaux, to be usually three, sometimes two, but never four. James Reed, Esq., collected, in East Florida, a specimen of the female plant, which scarcely presents a thorn either on the leaves or branches. Upon the whole, we are inclined to believe that the young and vigorous infertile shoots and branches are those which mostly present the greatest num-

ber of thorns, for all the flowering specimens we have seen are possessed of very little armature.

According to Catesby, this tree rarely rises higher than sixteen feet, with a diameter of one foot; the bark is whitish and rough, the trunk in particular, which is almost wholly covered with pyramidal protuberances terminated by sharp points. The leaves have nearly the same odor as those of the Orange, which in warm weather is perceptible at the distance even of forty or fifty feet, and, as well as the bark and seeds, are aromatic, astringent, and very pungent. It has long been employed as a remedy for appeasing the toothache.

PLATE LXXXIII.

*A twig and leaf of the natural size. a. The panicle of flowers. b. The male flower.*

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# LONG-LEAVED PRICKLY-ASH.

ZANTHOXYLUM MACROPHYLLUM. *Ramis petiolisque aculeatis, aculeis sparsis, foliis pinnatis 6–8-jugis, junioribus petiolisque pubescentibus, foliolis lanceolatis acuminatis vix inæqualibus, petiolulatis crenato-serrulatis, floribus paniculatis terminalibus, capsulis subsessilibus brevi-stipitatis.*

This elegant and curious tree is of frequent occurrence on the banks of the Arkansas, in the lower settlements, affecting dry and light soils at no great distance from the stream. It grows erect, branching toward the summit, and forming a rounded top. The height is about that of an ordinary Apple Tree, and the diameter about a foot or eighteen inches: the stem is, as usual, rough, with prismatic acute excrescences, which in an earlier stage of growth have been mere thorns.

Xanthoxylum

*Bastard Iron Wood*

Pl. LXXXIV

Nanthoxylum Pterota

...n Wood

Clavalier Ltd

That it must be a very different species from the preceding is evident by the climate it inhabits; the other nowhere extends beyond the warm sea-islands of South Carolina; this grows in a climate subject to severe frost and snow, as I experienced in the winter of 1819.

The leaves are nearly twice as long as in the southern species: they are about a foot in length, with often as many as eight pairs of leaflets. The leaflets are about three inches long and an inch wide, very distinctly acuminated, with the petioles pubescent, as well as the midrib of the leaves above and beneath, and, in a young state, the whole upper surface is puberulous. The prickles are small and scattered; the naked part of the common petiole rather more, sometimes, than two inches long. The leaflets are also scarcely at all oblique, never falcate, and the two sides from the midrib nearly of the same breadth. The panicle is loose and many-flowered, the capsules mostly one, rarely two, and shortly stipitate.

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# BASTARD IRON-WOOD.

ZANTHOXYLUM PTEROTA. *Foliis pinnatis, foliolis obovatis emarginatis, petiole communi marginato articulato inermi.*—WILLD., Sp. pl., ii. p. 666, (under *Fagara.*)

ZANTHOXYLUM *Pterota*, (HUMB., BONPL., and KUNTH,) prickly; leaves unequally pinnate: leaflets three to six pairs, obovate-oblong, obtuse, emarginate, glabrous, the margins crenate and glandularly punctate; petiole winged, prickly; spikes axillary, solitary or by pairs, shorter than the petiole; ovaries two; capsule solitary, prickles in pairs, stipular, hooked.—KUNTH, Synops., vol. iii. p. 325. TORREY and GRAY, Flor., Suppl., vol. i. p. 680.

PTEROTA *subspinosa*. *Foliis minoribus per pinnas marginato-alatas dispositis, sp*[illegible].—BROWNE Jamaic., p. 116, tab. 5, fig. 1.

*Lauro affinis jasmini folio alato costa media membranulis utrinque exstantibus alata, ligno durilie ferro vix cedens.*—Sloane, Jamaic., Hist., vol. ii. p. 25, tab. 162, fig. 1.

*An Sydroxylum Surinamense Lentiscini minoribus foliis, rachi media appendiculibus aucto.*—Pluk., Mant., p. 172.

An imperfect specimen of this species of Zanthoxylum was collected in Texas by Drummond. It appears also to be common on Key West, in East Florida, according to Dr. Blodgett. It becomes a small shrubby tree, about twelve to twenty feet high, so remarkable for the density of its wood, which is yellow and close, like Box, that, according to Sloane, it scarcely yields to iron in hardness. Sloane remarks, "If this be the Iron-Wood of *Ligon*, page 41, it grows in Barbadoes; and at page 75, he tells, that 'tis proper to make cogs; that neither sun nor wind hurts it, and that it is so hard as to break their tools." The leaves and other parts of the plant have a strong rutaceous odor.

The branches are either prickly or unarmed, covered with a gray bark. The leaves alternate, unequally pinnate; the leaflets, from four to six pairs, are obovate-oblong, and crenate on the margin, somewhat notched at the extremity, smooth and subsessile, scattered with pellucid punctures; the petiole, about five inches long, is marginated. The flowering panicles branched, axillary, and terminal. Flowers, four to six together, subsessile, greenish yellow, and fragrant. The calyx small and four-cleft. Petals four. Stamens four, longer than the petals, with the anthers yellow. The ovary, mostly single, ovate; style one, conical; mature fruit the size of a grain of black pepper, one-celled, two-valved, one-seeded. The seed smooth, shining, and of a dark brown color.

## PLATE LXXXIV.

*A branch of the natural size. a. A cluster of female flowers. b. The ripe capsule. c. The female flower enlarged. d. The male also, magnified.*

# WALNUT-LEAVED YELLOW-WOOD.

ZANTHOXYLUM JUGLANDIFOLIUM, *aculeatum. Foliis pinnatis, foliolis oblongis acuminatis obsolete serratis basi inæqualibus, petiolo communi subaculeato, paniculis terminalibus.*—WILLD., Sp. pl., t. c. No. 9. PERSOON, Synops., vol. ii. p. 615. DECAND., Prod., vol. i. p. 727.

ZANTHOXYLUM *Clava Herculis?*—MACFADYEN, Flora Jamaic., p. 194. (non. WILLD.) β LAM., Dict., vol. ii. p. 39.

Z. *Americanum sive Herculis arbor aculeata major, juglandis foliis alternis parum sinuosis.*—PLUK., Almag., p. 396, t. 239, fig. 6?

*Evonymi affinis arbor spinosa, folio alato, fructu sicco pentagono et pentacocco, ligno flavo santali odore.*—SLOANE, Catal. Jamaic., vol. i. p. 138; Hist., vol. ii. p. 28, t. 172?

SPECIMENS of this species of Yellow-Wood have been collected in Louisiana by Mr. Teinturier. It has also been found in the island of Nevis, and in St. Domingo, by Poiteau. In Jamaica, according to Dr. Macfadyen, it becomes a tree of about twenty feet in height, producing a valuable timber for house-building. The wood is yellow, close-grained, and, according to Sloane, has the aromatic odor of Sandal-Wood, and might probably be equally useful in driving away moths from chests made of it. He likewise adds, that it is one of the largest and tallest trees of the island, attaining the height of forty or more feet, and that it is also indigenous to Barbadoes, where it is accounted a good timber for in-door work.

The stem is erect and armed with thick spines. The leaves come out principally toward the end of the branches. They are unequally pinnate, and consist of six to eight pairs; the leaflets are mostly alternate, and become coriaceous, two or three inches long, marked with obscure pellucid dots and distant serrulations; the base is rounded and somewhat oblique, the leaves rather downy beneath. The common petioles are beset with a

few short scattered prickles, sometimes almost wholly absent. The panicle is terminal, much branched, and downy. The capsules are four or five, rather downy, containing black seeds.

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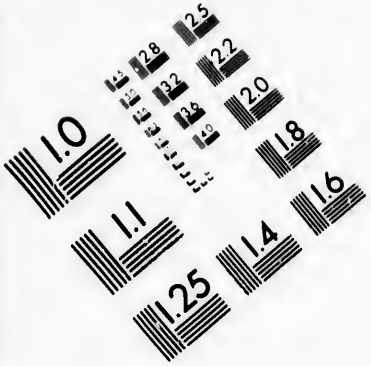
## FLORIDA SATIN-WOOD.

ZANTHOXYLUM FLORIDANUM. *Inerme, foliis pinnatis 2–3-jugis, foliolis ellipticis subovatis crenulatis pellucido-punctatis, glabris, paniculis terminalibus, multifloris, masculis 4–5-andris.*

THIS plant is said by its discoverer, Dr. Blodgett, to be a large and common tree on the island of Key West, where it is known by the name of Satin-Wood. A nearly-allied species of Guiana, called "Negro Pepper," from its aromatic and pungent fruit, (*Z. hermaphroditum,*) is said to grow forty or fifty feet high, and to produce white, hard, and close-grained wood.

The branches in our plant are cinereous, and much cicatrized with the vestiges of fallen leaves. The leaves themselves almost resemble those of some species of Ash; they are alternate, on common petioles about two inches long; the leaflets, two or three, rarely four pair, are elliptic or subovate, opposite, obtuse, narrowed at the base, and slightly oblique, with shallow, small crenatures on the margin, at length quite smooth, and very distinctly marked (when held against the light) with pellucid punctures or translucid aromatic glands; the petioles, young buds, and the stalks of the panicles, as well as the midrib of the young leaves, are thinly clad with close-pressed stellated hairs. The panicles of the male flowers are large, and contain very many crowded, small, yellowish-white flowers. The calyx is very small and five-toothed; the petals much larger, oblong-ovate, four to five, with the same number of stamens. The panicle of



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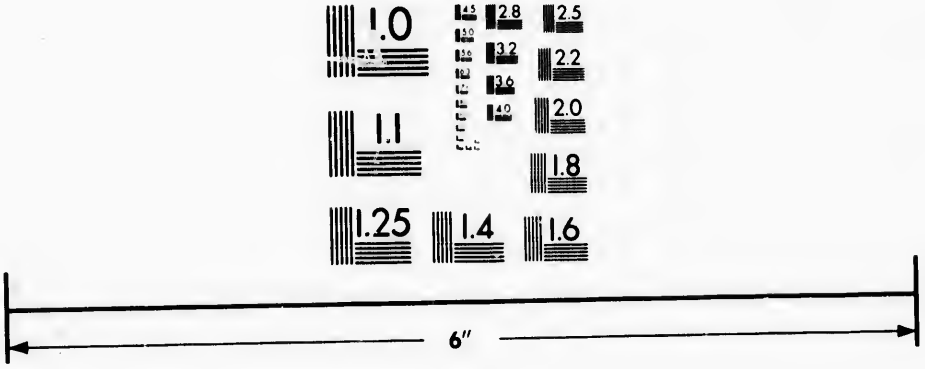


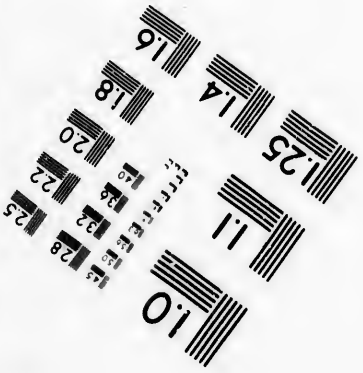


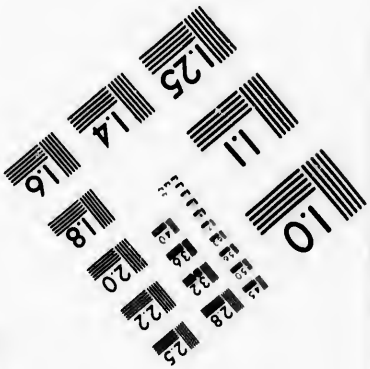


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Xanthoxylum Floridanum

*Florida Satin Wood.* *Clavalier des Florides*

female flowers is smaller than in the other sex, the calyx and corolla similar. The germs are mostly two, sometimes three, each terminated with a small style and a large unequal-sided capitate stigma. The capsules are brownish yellow and stipitate, covered with turgid glands, and each containing one shining black seed. This species appears to be allied to *Z. acuminatum*; but the leaves are not acuminate, and the flowers have four and mostly five stamens. From the rude figure of Sloane, t. 168, f. 4, we should almost be inclined to think it intended for our plant; but the leaves are entire and often emarginate, and hence the name of *Z. emarginatum* given by Swartz.

## PLATE LXXXV.

*A branch of the natural size. a. The male flower enlarged. b. The female flower. c. The ripe capsule.*

# LIGNUM-VITÆ TREE.

(Gayac, Fr.)

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*Natural Order*, Zygophylleæ, (R. Brown.) *Linnæan Classification*, Decandria, Monogynia.

GUAIACUM.* (Plumier and Decand.)

*Calyx* 5-parted, obtuse, deciduous, the divisions unequal. *Petals* five. *Stamens* ten, with the filaments naked or partly appendiculate. *Style* and *stigma* one. *Capsule* substipitate, 2 or 3 to 5-celled, with two to five salient angles. *Seeds* solitary, affixed to the axis, pendulous; albumen cartilaginous, cotyledons rather thick.

Trees of moderate elevation, with extremely hard and heavy wood; the branchlets trichotomous, leaves opposite, abruptly pinnated, the leaflets entire, pedunecles axillar and terminal, few and mostly clustered, 1-flowered, the flowers blue.

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## SMALL-LEAVED LIGNUM-VITÆ.

Guaiacum sanctum. *Foliis 5–7-jugis, foliolis ovalibus obtusis mucronulatis; petiolis ramulisque subpubescentibus.*—Decand., Prod., vol. i. p. 707.

Guaiacum sanctum. *Foliolis multijugis obtusis.*—Linn. Commel., Hort., vol. i. p. 171, t. 88. Lam., Encyc., vol. ii. p. 615.

*Jasminum vulgo Americanum. S. Evonymo affinis occidentalis, abatis rasci-*

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* Derived from a Mexican name altered by the Spaniards into *Guayacan*.

Guaiacum sanctum.

*Small leaved Lignum Vitæ* *Gayac bois saint*

*foliis, nuciferæ, cortice ad geniculos fungoso.*—Pluk., Almag., p. 139, t. 94, fig. 4.

*Lignum-Vitæ ex Brasilia.*—Blackwall, tab. 350, figs. 3, 4.

β G. *parvifolium. *Foliis subtrijugis foliolis obliquis, capsulis pentapteris.*

This species forms a spreading tree, resembling an Oak, with a thick, short trunk; and, according to Dr. Blodgett, (who found it to be abundant in Key West.) its fine blue flowers, in April, make a very beautiful appearance. It is a native likewise of various tropical parts of South America, the island of St. Domingo, St. Juan of Porto Rico, and Mexico. According to Plumier, the wood of this species is as hard and as heavy as that of the true Lignum-Vitæ, but of the color of Box. Yet Hernandez describes the wood as blue internally, which probably takes place in the older trunks, and thus again resembling the officinal Guaiacum. The bark of this tree is gray or yellowish gray, and even. The leaflets are never more than two or mostly three pair, somewhat cuneate-oblong, oblique, and obtuse, but terminating in short setaceous points; the young branchlets and margins of the leaves are somewhat pubescent. The flowers are terminal, on longish peduncles, and from two to four together. The segments of the calyx are nearly smooth and oblong. The petals, five, are oval, rounded, partly unguiculate, smooth, and perfectly entire. The capsule is turbinate, and furnished mostly with five salient angles or wings.

The wood of the true Lignum-Vitæ is so heavy as to sink in water: to the taste it is slightly bitter and inodorous. It takes a fine polish and turns well, being much used where solidity is an object, such as for ship-blocks, pestles, &c. The centre of the wood is of an obscure green, and is the part which contains the larger proportion of resin; the outer layer or sap-wood is more yellow, lighter, and contains very little resin. It is remarkably cross-grained, the strata of fibres running obliquely into one another, in the form of a letter X. It is usually sawed

into pieces of one to five hundredweight each, and seldom presents a diameter of more than twelve to eighteen inches.

The peculiar substance called Guaiacum (now Guaiacine) is procured from this tree. It is friable, semitransparent, light, of a brownish-green color when exposed to the air and light, and diffuses, on burning, a somewhat agreeable odor. It is slightly bitter, and produces in the mouth a sensation of smarting and heat. It dissolves entirely in alcohol, and partially in water. It either flows spontaneously and concretes in tears, or is obtained by incisions. The latter operation is performed in May. This substance is also obtained by sawing the wood into billets and boring a hole longitudinally through them, so that, when one end of the billet is laid on the fire, the gum flows readily from the other, and is collected in a calabash or gourd. It may also be obtained by boiling the chips or raspings in salt water, when the gum will separate from the wood and rise to the surface. Guaiacine differs from resin in the change of color produced on it by air and light, and the action of the acids, in not forming tannin but oxalic acid when treated with nitric acid, and in the large proportion of charcoal it affords when burnt.

Guaiacine is stimulant, diaphoretic, diuretic, and purgative. The Spaniards first imported the wood from America into Europe in the year 1508. It had then a high reputation as an antisyphilitic, and the names of *Holy Wood* and *Wood of Life* were given to it, and it was then in such esteem as to be sold at the rate of seven gold crowns a pound. Its virtues, however, in the treatment of this disease have been now wholly superseded by mercury. The decoction of the wood has been found useful in cutaneous diseases and scrofulous affections. The gum itself is an efficacious remedy in chronic rheumatism and arthritic affections, and may be substituted for the wood, of which it is the active medicinal ingredient. Its sensible effects are a grateful sense of warmth in the stomach, dryness of the mouth, and thirst, with a copious perspiration if the body be kept exter-

nally warm, or if the guiac be united with opium and antimonials; but when the body is freely exposed it acts wholly as a diuretic. The tincture diluted with water has been employed as a gargle to cleanse the mouth, strengthen the gums, relieve toothache, &c.

It is probable that our variety β (*Guaiac um parvifolium*) may be a distinct species from the true *G. sanctum*, and more nearly allied to the officinal species; but we have seen no authentic specimen for comparison, and our plant is certainly, at the same time, exactly similar with a specimen so marked and collected in St. Domingo by Poiteau. In the *Dictionnaire des Plantes Usuelles*, pl. 295, a. 1, there is a bad figure of the *G. sanctum*, which may be that of the *G. officinale*, while plate 294 is made up of the fruit of the true officinal Guaiacum and the simple opposite leaves of some other plant foreign both to the genus and order. In the *Icones Plantarum Medicinalium* of Nuremberg, tab. 540, the same false figure is given as the *G. sanctum*.

## PLATE LXXXVI.

*A branch of the natural size. a. The fruit.*

# BITTER-WOOD.

(Quassie, Fr.)

*Natural Order*, Simarubaceæ, (Richard.) *Linnæan Classification*, Decandria, Monogynia.

SIMARUBA.* (Aublet.)

Flowers monœcious, dicious, or polygamous.—*Calyx* small, 5-parted. *Petals* five, somewhat larger than the calyx. *Stamens* five to ten, with scales at their base. *Style* divided at the apex. *Carpels* usually of the same number as the petals, inserted by a joint on the axis, capsular, 2-valved, internally dehiscent and 1-seeded. *Seeds* without albumen, pendulous; cotyledons thick; radicle superior.

Trees or shrubs of the intertropical regions of America, with a very bitter bark and milky juice: the leaves alternate, pinnated, and without stipules.

## GLAUCOUS BITTER-WOOD.

Simaruba glauca. *Floribus monoicis, masculis decandris? stigmate 5-partito, foliis abrupte pinnatis, foliolis alternis subpetiolatis glabris glaucis.*—Decand., Prod., vol. i. p. 733. Humb., Bonpl., et Kunth., Nov. Gener. Am., vol. vi. p. 16.

* An Indian name given by Aublet, employed by the Galibis.

PL. LXXXVII.

Simaroubi Glauca

Glaucous Bitter Wood — Simaroubi à Glauque

This species of Bitter-Wood, often confounded with the officinal kind, was first observed by Humboldt in the island of Cuba, near the port of La Trinidad, and, according to the Herbarium of Poiteau, it also exists in St. Domingo, where it was seen probably by Aublet. In Key West, according to Dr. Blodgett, it becomes a lofty tree and flowers in April.

The *Simaruba excelsa*, according to Aublet, attains the height of sixty feet, with a diameter of two and a half feet. The timber, Dr. Macfadyen remarks, is of an excellent quality, the wood being of a yellowish color, inodorous, light, not very hard, but capable of receiving a very fine polish, and in Jamaica is much used for flooring. Insects will not approach the bedposts and clothes-presses made of it, on account of its bitter quality; and it has been employed for this reason to make cabinets for the preservation of collections of insects.

The officinal part of the *Simaruba officinalis* (from which the present species is scarcely distinct) is the bark of the root. It is inodorous, with a bitter but not disagreeable taste. The pieces are of a fibrous texture, rough, scaly, covered with warts, and of a full yellow color within, when fresh. Alcohol and water take up all its active matters by simple maceration, better than at a boiling heat. It is one of the most intense and durable bitters known, and has the property of a tonic and antispasmodic, being employed with advantage in intermittent and bilious fevers, obstinate diarrhœa, dysentery, and dyspeptic affections. The wood is much used in England to give bitterness to malt liquors, though the use of it subjects brewers to a very heavy penalty.

Every part of the present species is perfectly smooth, and the young branches and panicles are glaucous. The leaflets, five or six pair, are occasionally both alternate and opposite, oblong, obtuse, entire, narrowed, and somewhat oblique at the base, paler beneath, but not pubescent. The flowers appear to be wholly dioecious, as remarked by Dr. Wright, in the Jamaica

plant. The panicles are pedunculated and axillary; the flowers are small, yellowish with a tinge of red, scattered, and mixed with a few linear obtuse bractes. The petals are oblong-lanceolate. Stigmas five, revolute, smooth; germs the same number. The drupes or capsules are seldom more than three by the abortion of the other germs, oval, somewhat compressed, and obtusely carinated, of a deep reddish purple, with little or no pulp, indehiscent, and one-seeded. From their appearance they are in Jamaica called Bitter or Mountain Damsons.

## PLATE LXXXVII.

*A branch of the natural size.*

Coccoloba uvifera.

*Side Grape* *Raisinier à Grappe*

# COCCOLOBA.*

(LINN.)

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*Natural Order*, POLYGONEÆ, (JUSS.) *Linnæan Classification*, OCTANDRIA, TRIGYNIA.

Flowers PERFECT, or POLYGAMOUS.—*Calyx* 5-parted, petaloid, at length converted into a berry. *Corolla* none. *Stamens* eight, anthers rounded. *Ovary* 3-sided; stigmas three, short. *Drupe*, by abortion, 1-seeded, the nut oval and pointed.

Trees or shrubs mostly of Tropical America, with alternate, entire leaves, and short, cylindric, sheathing stipules; flowers herbaceous, in racemes, with articulated pedicels; the fruit resembling grapes.

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## SEA-SIDE GRAPE,

### (RAISINIER DE MER.)

COCCOLOBA UVIFERA. *Foliis cordato-subrotundis nitidis.*—LINN., WILLD., Sp. pl., vol. iii. p. 457. LAMARCK, Illust., t. 316, fig. 2. GÆRT., t. 45.

COCCOLOBA *foliis subrotundis integris nitidis planis, racemis fructuum cernuis.*—JACQ., Am., p. 112, t. 73. MILL., Dict., No. 1.

COCCOLOBUS *foliis crassis orbiculatis sinu aperto.*—BROWNE, Jam., p. 208.

POLYGANUM *caule arboreo fructibus baccatis.*—LINN., Sp. pl., ed. 1.

UVIFERA *foliis subrotundis, amplissimis.*—LINN., Hort. Cliffort., p. 487.

UVIFERA *litorea, foliis amplioribus fere orbiculatis crassis Americana.*—PLUKEN., Almag., p. 394, t. 236, fig. 7.

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* The name is derived from two Greek words, alluding to the lobing of the kernel at the base.

*Guajabara racemosa, foliis cuneiformibus subrotundis.*—PLUMIER, Ic., t. 145.
*Prunus maritima racemosa, folio subrotundo glabro, fructu minore purpureo.*—SLOANE, Jamaic., p. 183. Hist., vol. ii. p. 129, t. 220, f. 3. CATESBY, Carol., vol. ii. t. 96.
*Populus Americana rotundifolia.*—BAUHIN's Pinax., p. 430.

THE Sea-Side Grape forms a large and spreading tree along the coasts of many of the West India Islands, and on the shores of the extremity of East Florida, where it was observed at Key West, by Dr. Blodgett. It is truly remarkable for the enormous size of its almost round and smooth, strongly-veined leaves, which are often from eight to ten inches in diameter. The trunk attains the height of from twenty-five to sixty feet by two or more feet in diameter; the wood is heavy, hard, and valued for cabinet-work, when of sufficient size: it is of a red or violet color, and by boiling communicates the same fine color to the water. The extract of the wood, or of the very astringent seeds, forms one of the kinds of *kino* employed in medicine. This substance is of a very dark brown color with a resinous fracture. According to Oviedo, the Spaniards, when in want of pen, ink, and paper, used to employ the wide leaves of the Coccoloba, writing on them with the point of a bodkin.

From its maritime predilection, it is known in the Bahamas by the name of the *Mangrove Grape Tree.* The fruit, disposed in long racemose clusters, is composed of pear-shaped, purple berries, about the size of cherries; they have a refreshing, agreeable, subacid taste, with a thin pulp, are esteemed wholesome, and brought to the table as a dessert, for which they are in considerable demand; but if the stone be kept long in the mouth it becomes very astringent to the taste.

The branches are smooth and gray, but in old trunks the bark is rough and full of clefts. The leaves are dilated, round, and obtuse, with a narrow sinus at the base, and upon very short petioles. The racemes, of greenish-white polygamous flowers, are six to twelve inches long, articulated upon very short

Coccoloba parvifolia.

*Small leaved Sea Side Grape.* *Raisinier à petites feuilles*

peduncles, and grow by clusters, at first erect, but in fruit pendulous. The nut has a thin shell, half three-celled at the base, with narrow membranous dissepiments. Seed somewhat globular, acute, deeply umbilicated at base, brown and irregularly striated. There is sometimes an appearance of gummy exudation on the surface of the leaves, having an astringent taste like that of the extract.

PLATE LXXXVIII.

*A twig of the natural size. a. The male flowers. b. The flower. c. The raceme of fruit.*

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# SMALL-LEAVED SEA-SIDE GRAPE.

Coccoloba *parvifolia. *Dioica, foliis oblongo-lanceolatis ovalibusque, racemis erectis, floribus octandris.*

β ovalifolia. *Foliis ovalibus utrinque obtusis.*

Coccoloba *obtusifolia?*—Jacquin, Am., p. 114, t. 74.

This species, according to Dr. Blodgett, who found it growing on Key West, is a dioecious tree attaining the height of forty feet. It appears to have a near affinity to *C. obtusifolia* of Carthagena, at least our variety β; and there is a very similar species also indigenous to St. Domingo, according to the Herbarium of Poiteau. It appears very near to the "*Pigeon Plum*" of Catesby, plate 94, which, like the present, becomes a large tree, bearing a pleasant-tasted berry; its wood is hard and durable, and it affects rocky situations.

In this tree the branchlets are numerous, short, and covered with a light-gray bark. The leaves, smooth and even, situated at the extremities of the branchlets, are oblong-lanceolate, about three inches long and a little more than an inch in width, rather

acute at either end. Raceme of the *fertile* plant three to four inches long, the flowers solitary, with the lobes of the calyx whitish. In the infertile plant the racemes are longer, and the flowers smaller, and clustered along the stalk of the raceme by three or four together.

In the variety *β orafolia*, the leaves are sometimes nearly as broad as long, rounded at each end, and sometimes slightly sinuated at the base.

This species appears to be also nearly allied to *C. virens* of the "Botanical Register," plate 1816; but in that the flowers are decandrous and the racemes nodding.

## PLATE LXXXIX.

*A branch of the fertile plant of the natural size. a. A twig of the male plant. b. The male flower.*

Achras Zapotilla.

*Small Sapodilla* *Sapotilla or Common*

# SAPOTA PLUM.

(Sapotier, Fr.)

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*Natural Order*, Sapoteæ, (Jussieu.) *Linnæan Classification*, Hexandria, Monogynia.

ACHRAS.* (Linn.)

*Calyx* 5 or 6 to 8-parted; the divisions ovate, concave, and incumbent. *Corolla* the length of the calyx, 6-cleft, with the same number of parapetalous, alternate scales within and attached to the corolla. *Stamina* four to six; anthers adnate, ovate, with the two cells parallel. *Style* subulate, exserted. *Berry* with eight to twelve cells, the cells 1-seeded, and with many of the cells often abortive. *Seed* with a marginal hylum, and narrowed at the apex; embryo erect, without albumen, cotyledons fleshy.

Lactescent trees of Tropical America and India, with alternate, entire, coriaceous leaves without stipules; flowers axillary, and with the leaves aggregated at the extremities of the branches.

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## SAPOTILLA,

or

## NASEBERRY BULLY TREE.

Achras zapotilla. *Floribus aggregatis, foliis ellipticis utrinque obtusis, floribus hexandris.*

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* The Greek name of the wild pear.

Achras sapota. β (*Zapotilla*) *brachiatus diffusus, fructu subrotundo, cicatriculato mucrone breviori.*—Browne, Jamaic., vol. ii. p. 200.

Anona *maxima, foliis laurinis glabris viridi-fuscis, fructu minimo.*—Sloane, Jam., 206; Hist., vol. ii. p. 172, tab. 169, f. 2. Ray, Dendr., p. 79. Catesby's Carol., vol. ii. p. 87, t. 67.

*Sapota fructu turbinato minori.*—Plumier, Gener., p. 43.

β *parvifolia *foliis ellipticis brevibus utrinque obtusis submarginatis, fructibus majoribus.*

The small islands, or keys as they are called, at the southern extremity of East Florida, afford, in this tree, one of the fine fruits of Tropical America, indigenous also to Jamaica, St. Domingo, the Straits of Panama, and some other of the warmer parts of the continent of South America.

According to Dr. Blodgett, it is common on Key West, where it becomes a tree of thirty feet in height, bearing an agreeable, wholesome fruit, about the size of a pigeon's egg, which is larger than the small naseberry plum of Jamaica. When the fruit is green or first gathered, it is hard and filled with a milky or white juice as adhesive as glue; but, after being gathered two or three days, it grows soft and juicy: the juice, being then clear as spring-water, is very sweet.

The fruit of the true Sapota is said to be round, bigger than a quince, and covered with a brownish, more or less grooved skin; before maturity the flesh is greenish, milky, and of a very austere, disagreeable taste, like our unripe medlar, and hence the Spanish name of Naseberry; but when ripe it is reddish brown without, bright yellow within, well scented, of a very delicious taste, and quite refreshing. Jacquin even preferred it to the pineapple. Like all cultivated fruits, the sapotilla is subject to a variety of forms, some being oblong and ovoid, pear-shaped or round, others with the summit pointed and the base enlarged. According to Tussac, there is scarcely any fruit in the West Indies more esteemed, and it is there carefully cultivated.

In Jamaica, the Naseberry Bully Tree is one of the largest in the mountain forest, growing forty or fifty feet high, with a trunk as large as an Oak, and is esteemed as one of the best and strongest timber trees in the island. It bears a round fruit about the bulk of a nutmeg, rough externally, like a Russetting apple, and of the same color.

The summit of the Florida Sapotilla is spreading, and the branches covered with a light-gray bark. The leaves are clustered toward the summits of the twigs, and are about two inches long by an inch wide, elliptic, obtuse at each end, and often emarginate, with ferruginously-pubescent petioles an inch in length. The peduncles are about the same length, or a little longer, drooping, and aggregated by two or three together in the axils of the leaves. The calyx is brown, silky, and always closed, with three of the segments external. The corolla is cream-colored, and of the same length with the calyx.

The bark of the *Sapota* is very astringent and febrifugal, and was once supposed to be the true Jesuits' bark. The seeds of this plant are powerfully aperient and diuretic. The resin also, which its milky sap affords, is possessed of medical properties, and, when burnt, diffuses an odor of incense.

There appear to be two varieties of this tree at Key West, the one now figured, which we have called *β parvifolia*, and another with larger leaves, apparently identical with specimens collected by Poiteau in St. Domingo, and which he had marked *Achras Sapota*.

PLATE XC.

*A branch of the natural size. a. The fruit, somewhat reduced.*

# SOUTHERN IRON-WOOD.

(L'Argan, Fr.)

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*Natural Order*, Sapoteæ, (Jussieu.) *Linnæan Classification*, Pentandria, Monogynia.

BUMELIA.* (Swartz.)

*Calyx* 5-cleft, persistent. *Corolla* rotate, 5-parted, internally with the same number of toothed or trifid in-curved petaloid scales. *Stamens* five or ten, on short filaments arising from the base of the tube of the corolla. *Ovary* superior, rounded. *Style* short, stigma simple and obtuse. *Drupe* small and round, mostly containing one seed.

Shining or smooth trees, with alternate entire leaves, chiefly natives of the tropical parts of America or the warmer parts of the United States. Flowers small, in close axillary round corymbs or clusters. The wood generally hard and fetid.

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* A name given by the Greeks to the European Ash, and arbitrarily applied to this genus by Swartz.

Bumelia lycioides.

*Smooth leaved Bumelia* *Sapotillier a feuilles de Lucet*

† *Leaves Deciduous.*

# SMOOTH-LEAVED BUMELIA,

OR

# IRON-WOOD.

BUMELIA LYCIOIDES. *Spinosa erecta; foliis oblongo-lanceolatis basi attenuatis demum glabris, pedunculis calycibusque glabris.*

BUMELIA *lycioides.*—PURSH, Flor. Bor. Am., vol. i. p. 155. ELLIOTT, Sketches, vol. i. p. 287. PERSOON, Synops., vol. i. p. 237.

SIDEROXYLON *lycioides.*—LINN., Sp. pl. DUHAMEL, Arb., vol. ii. p. 260, t. 68. MICH., Flor. Bor Am., vol. i. p. 122.

SIDEROXYLON *læve.*—WALTER, Flor. Carol., p. 100.

LYCIOIDES.—LINN., Hortus Cliffort., p. 488.

A SMALL and rather elegant tree, from twelve to forty feet high, chiefly an inhabitant of low wet forests, from Carolina to Florida, and in Louisiana, not far from the banks of the Mississippi; but it is never met with in Canada, as stated by Willdenow in the "Species Plantarum." It was first introduced into France from the Mississippi, by the French Canadians, under the name of the Milk-wood of the Mississippi, from the fact that the young branches, when cut, yield a milky juice. The wood, according to Elliott, though not used by mechanics, is extremely hard, heavy, and irregularly grained, agreeing in this respect pretty nearly with the species of *Sideroxylon* of the West Indies, deriving their name from the hardness of their wood, which is compared to iron. One of the tropical species has wood nearly of the same yellow color and close grain as that of the Box Tree.

The younger infertile branches generally produce axillary spines, which often increase in size with the advancing growth of the wood. The bark of the trunk is gray and smooth, at length cloven into narrow longitudinal chinks; that of the

branches is brownish gray and smooth. The leaves, at first somewhat silky-pubescent and whitish beneath, are rather narrow and lanceolate, somewhat obtuse, smooth and reticulated above, attenuated below into a moderate and slender petiole, brought together usually in lateral clusters; in the centre of which, surrounded by the round clusters of flowers, issues occasionally a spine. The leaves, at length smooth, are about three inches long including the petiole, and an inch or less in width. The flowers, small and greenish, are in axillary or lateral rounded clusters; the peduncles simple, all of a length, and, as well as the calyx, quite smooth. The stamens are five in number, and about the length of the corolla. The leaves on the infertile branches are more decidedly lanceolate than the rest. The berries are oval, juicy, black when ripe, and about the size of small peas. A tree now in Bartram's Botanic Garden, at Kingsessing, in rather an unfavorable shady situation, probably forty years old or more, has attained the height of about forty feet, but, being slender, is not more than eight inches in diameter; it appears, however, as though it might attain a still larger growth, and is perfectly hardy in this climate.

PLATE XCI.

*A branch of the natural size. a. A cluster of berries. b. The flower.*

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## OBLONG-LEAVED BUMELIA.

BUMELIA OBLONGIFOLIA. *Spinosa erecta, foliis lanceolato-oblongis obtusis basi attenuatis subtus molliter pilosis, pedunculis brevissimis calycibusque villosis.*—NUTT., Gen. Am., vol. i. p. 135.

THIS species, which becomes a tree eighteen or twenty feet in height, is by far the most hardy of the genus, being indigenous

about the lead-mines in the vicinity of St. Louis, where the thermometer falls at times below zero. It is also not uncommon in Arkansas, in the shady alluvial forests of that stream, and it is met with on the borders of the Mississippi as far down as Natchez. It was first noticed botanically by my late friend, Mr. John Bradbury, F.L.S.

The bark is rough and gray, and the wood very hard, tough, and fetid,—indeed, so much so, that it would probably drive away insects from chests made of its wood. In its natural haggard state, near the lead-mines, it is an ungraceful tree with numerous tortuous and flexuous branches. The young branchlets, as well as the petioles, are clothed with soft brownish-gray hairs. The leaves somewhat resemble those of *B. lycioides*, but they are larger, being three to four inches long by one to one and a half wide, and more or less hairy beneath, even when adult. The flowering clusters are dense, the flowers numerous, on hairy peduncles scarcely longer than the ferruginously-villous calyx, the segments of which are ovate and concave. The inner scales, nearly equal with the corolla, are connivent and trifid, situated opposite to the stamens. Drupe fleshy, purple, at length blackish brown.

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## RUSTY-LEAVED BUMELIA.

BUMELIA FERRUGINEA. *Inermis, foliis oboratis pubescentibus obtusis subtus ferrugineo-tomentosis, corymbis multifloris, calycibus pedunculisque rufo lanatis, floribus pentandris.*

OF this apparently very distinct species of Iron-wood, I know nothing more than the single imperfect specimen collected by Mr. Ware in East Florida. The leaves in the spineless infertile branch are unusually wide, being one and a half inches by two

and a half inches in length: those on the flowering branch, however, are much smaller. It is quite remarkable for the dense ferruginous pubescence on the under side of the leaves, young branches, and calyx. Its nearest affinity is at the same time to the preceding species.

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## SILKY-LEAVED BUMELIA.

BUMELIA TENAX. *Erecta, ramis junioribus spinosis, foliis cuneato-lanceolatis plerumque obtusis, subtus sericeo-nitentibus, subaureis, calycibus villosis.*

BUMELIA *tenax.*—WILLD., Sp. pl., vol. i. p. 1085. PERSOON, Synops., vol. i. p. 237. ELLIOTT, Sketch., vol. i. p. 288. LOUDON, Encyc. Plants, p. 149, t. 2394.

BUMELIA *chrysophylloides.*—PURSH, Flor. Bor. Am., vol. i. p. 155.

SIDEROXYLON *tenax.*—LINN., Mant., p. 48. JACQUIN, Collect., vol. ii. p. 252.

SIDEROXYLON *chrysophylloides.*—MICH., Flor. Bor. Am., vol. i. p. 123.

SIDEROXYLON *sericeum.*—WALTER, Carol., p. 100.

CHRYSOPHYLLUM *Carolinense.*—JACQ., Observ., vol. iii. p. 3, t. 54.

THIS very elegant-leaved species becomes occasionally a tree twenty to thirty feet high, with hard, tough wood, and the trunk clothed with a light-gray bark. The young branches are slender, straight, flexible, and, as in all the species of the genus inhabiting the United States, very difficult to break: hence the specific name of the present, (*tenax.*) The leaves are much smaller than in any of the preceding species; smooth above, beneath silky and shining, with the down usually of a pale-golden or ferruginous color; adding a peculiar elegance and splendor to the foliage, nearly equal to that of the true *Chrysophyllum*, or Golden-Leaf of the West Indies. The flowers and leaves, as usual, are both

Bumelia tenax.

*Silky-leaved Bumelia.* *Sapotillier tenace.*

clustered at the extremities of the projecting buds of the former season; but the older fertile branches do not appear to produce any thorns. The pedunceles of the sessile corymbs are very long, and, as well as the calyx, clothed with ferruginous down. According to Willdenow, the drupes are oval. Inner corolla or nectarium five-parted as the corolla, but with the divisions trifid, and the middle segment longest.

This species affects dry, sandy soils, and is met with, not uncommonly, from the sea-coast of South Carolina to East Florida. Bose remarks that at the approach of evening the flowers give out an agreeable odor. In the Bartram Garden, there is a tree of this species, less silky than usual, which is perfectly hardy.

PLATE XCII.

*A branch of the natural size. a. The flower. b. The berry*

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# WOOLLY-LEAVED BUMELIA.

Bumelia lanuginosa, *spinosa; ramulis patentissimis, pubescentibus; foliis emarginato-lanceolatis obtusis; subtus lanuginosis ferrugineis nec sericeis; calycibus glabris basi pilosiusculis.*

Bumelia *lanuginosa.*—Persoon, Synops., i. p. 237. Pursh, Flor. i. p. 155.

Sideroxylon lanuginosum, *spinosum; ramulis patentissimis, pubescentibus; foliis ovali-lanceolatis, supra glabris, subtus lanuginosis nec sericeis.* —Mich., Flor. Bor. Am., vol. i. p. 122.

This is a smaller tree than the preceding, affecting the same situations,—bushy swamps on light soils,—and is met with in Georgia and the lower part of Alabama. The leaves are small, as in the preceding species, but covered beneath with a dull-brown wool, not very thick, nor in the least shining; their form

is cuneate-oblong, or sublanceolate and obtuse, about an inch and a half long and a little more than half an inch wide, on short petioles like all the rest of our species. The flowers are also much smaller, and the calyx nearly smooth. In this species likewise the spines are stout, sharp, and persistent. Its real affinity is to *B. lycioides*, but it is in all parts much smaller.

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## LARGE-FRUITED BUMELIA.

Bumelia macrocarpa. *Depressa, ramis gracilibus valde spinosis, spinis elongatis tenuibus subrecurvis, foliis parvulis cuneato-lanceolatis obtusis junioribus lanuginosis, demum subglabris concolo.ibus; drupa maxime ovali.*

This very low bushy species, allied to *B. reclinata*, I give (though from very imperfect specimens) to complete the history of our species of the genus. The twigs are very slender, at first pubescent, covered with a gray bark, and with the spines long and slender as needles. The leaves, before expansion, are exceedingly lanuginous, and always small, with very short petioles, at length nearly smooth. The fruit is edible, and as large as a small date! I found this species on the sandy hills not far from the Altamaha, in Georgia, in winter, and therefore do not know the flower. It does not grow more than a foot high, and the leaves are little more than half an inch long.

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†† *Leaves semipervirent.*

## NARROW-LEAVED BUMELIA.

Bumelia angustifolia. *Glabra spinosa, foliis lineari-oblongis obtusis, floribus aggregatis glabris, drupa oblonga umbilicata.*

Bumelia angustifolia

*Narrow-Leaved Bumelia.* *Sapotillier à Feuilles Etrites*

This tree, according to Dr. Blodgett, is common at Key West, where it attains the height of forty feet. The wood is probably equally hard with that of the other species of the genus. The branches before us are more or less spiny, and covered with a brown but externally silvery-gray bark. The leaves, unusually small and narrow, come out in clusters from the centre of preceding buds; they are very smooth, apparently evergreen and coriaceous, linear-oblong and obtuse, attenuated into a sort of false petiole, and are about an inch and a quarter long by about three lines wide. The peduncles are aggregated, rather short, and, as well as the calyx, smooth. Segments of the calyx ovate, the two outer smaller. Corolla yellowish white, not longer than the calyx.

The berry, about the size and form of that of the Barberry, is purplish black, and covered with a [illegible], oblong-elliptic, by abortion one-seeded, the three or four others [illegible] stilled, and the one large, cartilaginous seed filling up the whole cavity; the berry is umbilicated at the apex, and terminated with the persistent, subulate, slender style; the pulp is waxy, milky probably before ripe, as in the Sapotilla. The seed is large, cylindric-oblong, pale, testaceous, hard, and very shining, with an internal longitudinal sutnre, bright brown at the tip of the base, with a conspicuous lateral basal cicatrice.

This species has a considerable affinity with *Sideroxylon spinosum* of Linnæus, a native of India and Africa, the berries of which are acidulous, and agreeable to eat.

## PLATE XCIII.

*A branch of the natural size, in flower. a. A branch with ripe berries.*

# FETID BUMELIA.

Bumelia fœtidissima. *Foliis lanceolato-oblongis obtusis subemarginatis, pedunculis confertis axillaribus.*—Willd., Sp. plant., vol. ii. p. 1086. Persoon, Synops., vol. i. p. 237.

Sideroxylon fœtidissimum. *Inerme, foliis subopposite, floribus patentissimis.*—Linn., Mantis, p. 49. Jacq., Am., p. 55. Lam., Dict., vol. i. p. 247.

This is another species, becoming a large tree, equally indigenous to Key West and the island of St. Domingo, and was found by the same person with the former. Poiteau met with it in the mountainous woods of Hayti, and it was in flower in October. It is said neither to be spiny nor milky-juiced, and it bears a round berry almost as large as a cherry.

In this species the leaves are very smooth and large, disposed chiefly at the extremities of the branches; they are nearly elliptic and obtuse, somewhat waved on the margin, on petioles nearly an inch in length, and of a thinnish consistence, yet somewhat coriaceous; they are three to three and a half inches long, and from one and a half to two inches wide. The flowers are numerous and in dense clusters, produced, apparently, in the axils of preceding leaves, and therefore appear wholly lateral. The calyx is almost entirely smooth, with oval segments; the corolla very spreading, yellowish white, with five stamens. The stigma, very different from that of the preceding species, is wholly sessile on the summit of the oblong germ, and is membranous and concave. The berry, apparently yellow, is by abortion only one-seeded. The specimens collected in St. Domingo, by Poiteau, are marked *Samara*, probably from the very peculiar, almost cup-shaped stigma, and spherical fruit. It seems to be nearly allied to *Sideroxylon lucidum* (Solander) as described by Lamarck, Dict., vol. i. p. 246. It is also nearly allied, apparently, to *B. pallida*.

PLATE XCIV.

*A branch of the natural size.*

Bumelia foetidissima.

*Foetid Bumelia.* *Sapotillier très fétide.*

**Arbutus Menziesii.**

*Menzies Strawberry Tree.* *Arbousier Menzies.*

# STRAWBERRY TREE.

(Arbousier, Fr.)

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*Natural Order*, Ericeæ, (R. Brown.) Tribe Arbuteæ, (Decand.)
*Linnæan Classification*, Decandria, Monogynia.

ARBUTUS.* (Camer. Tournefort.)

*Calyx* inferior, 5-parted. The *corolla* globosely or ovately campanulate; the narrow border 5-cleft and reflected. *Stamens* ten, included. *Anthers* compressed at the sides, opening by two terminal pores, attached below the summit where they produce two reflected awns. *Ovarium*, seated upon or half immersed in a hypogynous disk, 5-celled, cells many-seeded. *Style* one; *stigma* obtuse. *Berry* nearly globular, rough, with granular tubercles.

Large or small trees of the South of Europe, the Levant, Mexico, and Oregon. The leaves alternate and sempervirent; racemes axillary or terminal and paniculate. Flowers pedicellate, provided with bractes; the corolla white or reddish.

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## MENZIES'S STRAWBERRY TREE.

Arbutus Menziesii. *Arborea, foliis ellipticis acutis subserratis longe petiolatis glabris, racemis paniculatis densiforis axillaribus terminalibusque.*
Arbutus *Menziesii*.—Pursh, Flor. Bor. Am., vol. i. p. 282.
Arbutus *laurifolia?*—Linn., Suppl., 238.
Arbutus *procera*.—Douglas, Bot. Reg., tab. 1573.

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* An ancient name for the *Arbutus Unedo*.

This is rather a common species on the banks of the Oregon and the Wahlamet, below Fort Vancouver, in rocky places, where it becomes a tree thirty to forty feet high, with a smooth and even light-brown trunk, from which the old bark exfoliates, so that it appears as if it were stripped nearly down to the living surface. The top is somewhat pyramidal and spreading. The leaves, resembling those of the laurel, are thick, and of a rigid consistence, crowded toward the extremities of the branches; they are chiefly elliptic and mostly entire, though on the young shoots sharply serrate. The flowers are very abundant, in dense pyramidal panicles, made up chiefly below of axillary, sessile racemes; they are nearly globular and yellowish white; these are at length succeeded, about August, by fine, showy clusters of orange-yellow berries, which are rather dry, and coated with a thin layer of granular, tubercular pulp.

This species appears to be very closely allied to *A. Andrachne* of the Levant, and I suspect it is not sufficiently distinct from *A. laurifolia* of Linnæus. At any rate, there is certainly but one arborescent species of the genus in the Oregon Territory. The young leaves are, in fact, as described, sharply serrate, and the older leaves likewise vary in this respect, some being wholly entire or nearly so, and others distinctly serrulate.

We found the wood to be white, hard, and brittle, and of no economical value except as indifferent fuel. Its diameter was usually from one to two feet. The pulp of the fruit is somewhat aromatic, but wholly inedible. The cells only about two-seeded, the seed, rather large and angular, chiefly filled with a fleshy albumen.

All the species of the genus are highly ornamental, and particularly the Strawberry Tree (*A. Unedo*) of South Europe, which covers whole mountains in the kingdom of Leon in Spain. The peasants and their children eat the fruit, though not very agreeable and somewhat narcotic when taken in large quantities. The leaves, in some parts of Greece, are employed

for tanning leather, and are also used as an astringent remedy in medicine. In the island of Corsica, an agreeable wine is said to be prepared from the berries of the *A. Unedo;* and in Spain, both a sugar and a spirit are obtained from them.

PLATE XCV.

*A branch of the natural size. a. The berries.*

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Sorrel Tree, (*Andromeda arborea.*) A tree of this species, now growing at the Bartram Garden, is more than sixty feet high, with a circumference of four feet.

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# TREE WHORTLEBERRY.

Batodendron arboreum.—Nutt., in Phil. Trans., Phila., vol. viii.

Vaccinum *arboreum.*—Marshall, p. 157. Mich., Flor. Bor. Am., vol. i. p. 230. Pursh, Flora, vol. i. p. 285. Elliott, Sk., vol. i. p. 495.

Vaccinum *diffusum.*—Aiton., Hort. Kew., vol. ii. p. 11.

This species, commencing to appear on the dry margins of swamps in North Carolina, and extending to Florida and Arkansas, becomes a tree of ten to twenty feet in height, with an irregular round top, and sending out many long, straight suckers from the root. The leaves are nearly evergreen, oboval, or almost round, smooth and shining. The racemes arise from the old wood, with the flowers white, tinged with red, and angular. The berries are round, smooth, black, nearly dry, and astringent, filled with a granular pulp almost like sawdust; yet the taste is pleasantly subacid.

The bark of the root is astringent, and is sometimes given in decoction as a remedy for chronic dysentery and diarrhœa. The dried fruit is equally efficacious and more agreeable to the palate.—(Elliott.) We have not sufficient materials for a figure of this curious tree.

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Mountain Laurel (*Rhododendrum maximum*) "is found at Medfield and Attleborough in Massachusetts, and also, I believe, near Portland in Maine."—(G. B. Emerson.) I am unable to decide whether this interesting plant is found as far north as the State of Maine, though it is not improbable. On the high banks of the Delaware near Bordentown, we meet with natural clumps of this shrub, which in Pennsylvania is scarcely found nearer than the first chain of the Alleghany Mountains.

Spoon-Wood (*Kalmia latifolia*) "abounds in almost every part of Massachusetts, as far north as Lowell," (G. B. Emerson.) and I have reason to believe, also, that it extends into Maine. The largest plants of this species which I have ever seen, not inferior to stout Peach Trees, were in the great cypress-swamp near Dagsbury in Sussex county, Delaware. In the same locality also grew the *Ilypa tinctoria*, *Laurus Borbonia*, and the *Quercus hemispherica*.

# MELON, OR PAPAW TREE.

(PAPAYER, Fr.)

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*Natural Order*, PAPAYACEÆ, (VON MARTIUS.) *Linnæan Classification*, DIŒCIA, DECANDRIA.

PAPAYA.* (TREW, TOURN., JUSSIEU.) CARICA. (LINN.)

DIŒCIOUS OR POLYGAMOUS.—*Calyx* inferior, minute, and 5-toothed. *Corolla* monopetalous, with a contorted æstivation, in the staminiferous flower tubular, with five lobes and ten stamens, all arising from the same line, with those opposite the lobes sessile, the other alternate ones on short filaments; *anthers* adnate and 2-celled, opening lengthways: the *corolla* in the fertile flower is nearly campanulate, and 5-parted almost to the base. *Ovary* superior, 1-celled, with five parietal, many-seeded receptacles; *stigma* sessile, 5-lobed, fringed. *Fruit* a succulent, indehiscent pepo. *Seeds* spherical, enveloped in a loose, mucous coat, having a brittle, pitted shell; the embryo in the axis of a fleshy albumen; cotyledons flat, with the radicle inclined to the hylum.

These are spongy-wooded, quick-growing trees of Tropical America, without branches, like Palms, and yielding an acrid, thin, milky juice; the leaves are alternate and large, digitate or palmately lobed, on long petioles; the male flowers in axillary racemes with clustered flowers; the female flowers usually solitary.

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* The native American name. Linnæus changed the name for *Carica*, because it was said to be a native of Caria; but, as the plant has no sort of relation with that country, it is better, with Jussieu and Lamarck, to retain the older and better name.

# COMMON MELON OR PAPAW TREE.

PAPAYA VULGARIS. *Foliis palmatis 7–9-lobis sinuatis, laciniis oblongis acutis, floribus masculis racemoso-corymbosis.*

PAPAYA *vulgaris*.—DECAND., in Lamark's Dict., vol. v. p. 2. Illust., t. 821.

CARICA *Papaya*.—LINN., Sp. pl. WILLD., Sp. pl., vol. iv. p. 814.

*Carica fronde comosa, foliis peltatis; lobis varie sinuatis*.—BROWNE, Jam., p. 360.

*Papaya fructu melo-peponis effigie*.—PLUM., Catal., p. 20. TREW., Ehret., t. 7? TOURN., Inst., p. 659.

Papaya maram.—RHEED, Malab., vol. i. t. 15, fig. 1, [male.] Amhapaya, fig. 2, [female.]

*Arbor melonifera*.—BOUTIUS, p. 96.

*Arbor platani folio, fructu peponis magnitudine edidi*.—BAUHIN, Pinax, p. 131. MERIAN., Surinam, p. 40, tabs. 40 and 62, 64.

THE Papaw Tree, rising erect into the air without branches to the height of twenty feet, in its mode of growth may be compared to the Palms, or to the tall and herbaceous Banana, while its true relations are to the Gourd and Passion-flower tribes. The elegant palmated leaves spread out only toward the summit of the stem, and form a wide circle like an airy umbrella. The stem is cylindric, about a foot in diameter, with the wood of a soft and spongy consistence, and so fibrous as to afford a material for cordage like hemp. In six months it attains the height of a man, and soon after begins to flower, attaining its utmost magnitude in three years.

The root is perpendicular, whitish, spongy, and of a disagreeable taste and smell. The stem is marked nearly its whole length with the scars of the fallen leaves, and is of a somewhat solid consistence toward the base. The leaves are on petioles which are near upon two feet long; they are deeply divided into seven or nine sinuated gashed lobes. The flowers are axillary, yellowish white, and fragrant; the barren ones in

**Papaya vulgaris.**

*Papaw Tree.* *Papayer Commun.*

pendulous racemes with the flowers disposed in corymbose clusters; the fertile flowers are rather numerous, on short usually-simple thickened pedicels. The fruit, produced throughout the whole year, is about the size of a small musk-melon, usually oval or round, and frequently grooved; it is yellow, inclining to orange when ripe, containing a bright yellow, succulent, sweet pulp, with an aromatic scent; the seeds, a little larger than those of mustard, have a warm taste almost like that of cresses.

The fruit of the Papaw, when boiled and mixed with lime-juice, is esteemed a wholesome sauce to fresh meat, in taste not much unlike apples. It is likewise employed as a pickle, when about half grown, being previously soaked in salt water to get rid of the milky juice it contains, and is, when ripe, frequently preserved in sugar and sent to Europe with other tropical sweetmeats. The juice of the unripe fruit, as well as that of the seed, acts as a powerful and efficacious vermifuge, and its chief constituent, singularly enough, is found to be *fibrine*, a principle otherwise peculiar to the animal kingdom and the fungi.* An application of the milky sap is said to be a remedy for the tetter or ringworm, and upon the coast of Malaquette in Africa, the leaves are employed as an abstergent in place of soap; they are also used for the same purpose by the African creoles of the West Indies.

The Papaw, moreover, has the singular property of rendering the toughest animal substances tender, by causing a separation of the muscular fibre; even its vapor alone is said to produce this effect upon meat suspended among the leaves, and that poultry and hogs, though old, become tender in a few hours after feeding on the leaves and fruit. This property was first described by Browne in his "History of Jamaica," who remarks that meat washed in the milky juice, mixed with water, became in a few hours so tender that when cooked it could scarcely be taken from the spit.

* Thompson's "Annals of Chemistry," l. c.

The utility of the Papaw is proved by the fact of its being cultivated over the whole of South America, (according to the observations of Humboldt and Bonpland;) it is likewise cultivated throughout India and in many of the islands of the Pacific, particularly in the Friendly and Sandwich Island groups; here it frequently produces fruit at the height of six or eight feet. In the wilds of East Florida, according to Bartram, it presents a more imposing and stately appearance, and adds a peculiar feature to the almost tropical scenery of the forests of the St. John. It is also met with on the small islands or keys near the extremity of the peninsula, and is indigenous to many parts of South America and the West India Islands.

Linschoten says it came from the West Indies to the Philippines, and was taken thence to Goa. According to Sloane, it grows wild in the woods of Jamaica, but is there of small stature. It was observed also at Realejo in Guatemala, by Dr. Sinclair.

In Bartram's Travels, (p. 131,) is given a very animated and exact description of this graceful tree. He adds, it "is certainly the most beautiful of any vegetable production I know of; the towering Laurel Magnolia, and exalted Palm, indeed exceed it in grandeur and magnificence, but not in elegance, delicacy, and gracefulness; it rises erect, with a perfectly-straight tapering stem, to the height of fifteen or twenty feet, which is smooth and polished, of a bright ash color. Its perfectly-spherical top is formed of very large lobesinnate leaves, supported on very long footstalks; the lower leaves are the largest as well as their petioles the longest, and make a graceful sweep, like the long *f*, or the branches of a sconce candlestick. The ripe and green fruit are placed round about the stem or trunk, from the lowermost leaves, and upward almost to the top. It is always green, ornamented at the same time with flowers and fruit."

PLATE XCVI.

*The female tree on a reduced scale. a. The female flower of the natural size. b. A portion of the male raceme, of the natural size.*

**Cornus Nuttallii.**

*Large flowered Dogwood.* *Cornouiller de Nuttall.*

# DOGWOOD.

(Cornouiller, Fr.)

*Natural Order*, Cornaceæ, (Decand.) *Linnæan Arrangement*, Tetrandria, Monogynia.

CORNUS.* (Tournefort.)

Border of the *calyx* 4-toothed, minute. *Petals* oblong, spreading. *Stamens* four, longer than the corolla. *Style* somewhat club-shaped. *Stigma* obtuse or capitate. *Drupes* free, berried, 1 to 2-celled, 1 to 2-seeded.

The plants of this genus are chiefly trees or shrubs, rarely herbaceous, with a bitter bark. Leaves opposite, (or rarely somewhat alternate,) usually entire, without stipules, and feather-veined. Flowers small and white, disposed in compound, terminal, flat clusters or cymes; sometimes capitate and surrounded by a colored involucrum resembling petals. Hairs of the leaves and stems affixed by the centre.

## LARGE-FLOWERED DOGWOOD.

Cornus nuttallii, (Audubon.) *Arborescens: involucris 4–6-foliolatis, foliolis obovatis acutis acuminatisve basi angustatis; foliis ovalibus, vix acuminatis; cortice lævi.*

Cornus nuttallii. Leaves of the involucrum 4–6-obovate, acute or acuminate, narrowed at the base; drupes oval; leaves oval, scarcely acuminate.—Torrey and Gray, Flor. N. Am., vol. i. p. 652. Audubon, Birds of America, plate 367.

Cornus *Florida*.—Hooker, Flor. Bor. Am., vol. i. p. 277, (partly.)

On arriving, toward the close of September, in 1831, at Fort Vancouver, I hastened again on shore to examine the produc-

* From *cornu*, a horn, in allusion to the hardness of the wood.

tions of the forests of the Far West; and nothing so much surprised me as the magnificent appearance of some fine trees of this beautiful Cornus. Some of them growing in the rich lands near the fort were not less than fifty to seventy feet in height, with large, oval-acute, *lucid* green leaves, which, taken with the *smooth* trunk and unusually-large clusters of crimson berries, led me, at first glance, to believe that I beheld some new Magnolia, until the flower buds, already advanced for the coming season, proved our plant to be a Cornus, allied in fact to the *Florida*, but with flowers or colored involucres nearly six *inches* in diameter! These appeared in all their splendor, in May of the following year, of a pure white with a faint tinge of blush; the divisions, also, of this brilliant pseudo-flower are usually five or six in number, of an obovate outline, with the points often acute. The leaves are about four inches long and two and a half wide, with a considerable quantity of pubescence beneath. The cluster of bright red berries is scarcely inferior to that of the cone of the *Magnolia tripetala*, and each of them is strongly terminated by the four persistent teeth of the calyx and the style. The petals are oblong-ovate, shorter considerably than the stamens.

The wood, like that of all the species, is very hard, close-grained, of slow growth, and would be useful for all the purposes for which the wood of the *C. Florida* is employed. The extract of the bark, boiled down to a solid consistence, containing in a very concentrated state the vegetable principle cornine, we found of singular service in the settlement of the Wahlamet, where, in the autumn of 1835, the intermittent fever prevailed. In most cases pills of this extract timely administered gave perfect relief. Though the berries are somewhat bitter, they are still, in autumn, the favorite food of the Band-Tailed Pigeon. To the north this species prevails, probably as far as Fraser's River or Sitka, but we did not meet with it in California, nor anywhere eastward, even in the vicinity of the lower falls or cascades of the Oregon. There is, therefore, no doubt but that it is as hardy as the Com-

mon Dogwood and more deserving of cultivation. It has been raised in England from seeds which I brought over, but the plants are yet small.

PLATE XCVII.

*A branch of the natural size. a. A cluster of berries.*

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William Bartram, in his *Travels in Georgia and Florida*, gives the following account of the appearance of the Dogwood (*Cornus Florida*) as it appeared near the banks of the Alabama:—"We now entered a remarkable grove of Dogwood Trees, which continued nine or ten miles unaltered, except here and there by a towering *Magnolia grandifolia*. The land on which they grow is an exact level: the surface a shallow, loose, black mould, on a stratum of stiff yellowish clay. These trees were about twelve feet high, spreading horizontally; and their limbs, meeting and interlocking with each other, formed one vast, shady, cool grove, so dense and humid as to exclude the sunbeams, and prevent the intrusion of almost every other vegetable; affording us a most desirable shelter from the fervid sunbeams at noonday. This admirable grove, by way of eminence, has acquired the name of the *Dog Woods*. During a progress of near seventy miles through this high forest, there was constantly presented to view, on one hand or the other, spacious groves of this fine flowering tree, which must, in the spring season, when covered with blossoms, exhibit a most pleasing scene:" p. 101.

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# WOOLLY-LEAVED CORNUS.

CORNUS PUBESCENS. *Ramis purpurescentibus, ramulis cymisque hirsutis; [illegible] ovalibus acutis glabriusculis subtus pallidis hirsuto-pubescentibus, [illegible] depressis, dentibus [illegible] minutis, petalis lanceolatis acutis.*—NUTT., in TORREY and [illegible], vol. [illegible], p. 652.

Cornus *circinata*.—Chamis. and Schlecht., in Linnæa., vol. iii. p. 139.
Cornus *sericea*, β? *Occidentalis*. Leaves larger, more tomentose beneath.—Torr. and Gray, vol. i. p. 652.

This species is confined to the immediate borders of the Oregon and Wahlamet, in wet and dark places. According to Chamisso, it also exists round San Francisco in Upper California. The stem is about six feet high, but it has no pretensions to become a tree, and is only introduced here for want of any other suitable opportunity of publishing it. Its true affinity is to *Cornus stolonifera*. The stem is similarly inclined and full of slender red twigs. It differs from that species, however, in the nature of its pubescence, which is whitish and hirsute, with a crowded and close hirsute cyme, and larger lanceolate petals. The leaves are also oval or somewhat broad-ovate, and merely acute, not acuminate, almost smooth above, whitely and somewhat hirsutely pubescent beneath. The flowers are white and rather large, crowded so as to hide the pedicels. The fruit we have not observed.

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White Cornel. (*Cornus stolonifera*, *C. alba*, Pursh.) This species grows on the borders of streams in the Rocky Mountain range, and also on the banks of the Oregon, and in the Blue Mountains of that territory.

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The Cornel-cherry (*Cornus mas*) is a native of the South of Europe, but thrives well in this climate. It blossoms early, and bears a handsome crimson fruit, about the size and appearance of a cherry, which was formerly used for tarts and made into a roll. The wood is very hard, and, made into wedges, will endure almost like iron. It has long been cultivated in the Bartram Garden, in this vicinity, where fine plants may be seen in the autumn full of fruit.

Chionanthus Virginica

*Fr. Ange* *Chionanthe de Virginie*

# FRINGE TREE.

(Chionante, Fr.)

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*Natural Order*, Oleineæ, (Hoffmansegg and Link.) *Linnæan Classification*, Diandria, Monogynia.

CHIONANTHUS.* (Linn.)

*Calyx* 4-toothed. *Corolla* monopetalous with a short tube, the border 4-cleft, the segments very long, pendulous, narrow, and linear. *Stamens* two, sometimes four, included and inserted into the tube. *Ovarium* bilocular; ovules pendulous and collateral, two in each cell. *Style* short; stigma partly bilobed. *Drupe* succulent, 1-seeded, the seed provided with albumen. *Embryo* inserted.

Small trees of India and the warmer and temperate parts of America, with opposite, simple, and entire leaves; the racemes or panicles of flowers terminal or axillary.

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## COMMON FRINGE TREE.

Chionanthus Virginica. *Panicula terminali trifida; pedunculis trifloris; foliis ovatis.*—Willd., Sp. pl., vol. i. p. 46.

Chionanthus, *pedunculis trifidis trifloris.*—Linn., Hort Cliff., p. 17.

Duhamel, Arb., vol. i. p. 165. Du Roi, Harbk., vol. i. p. 150. Lam., Dict., vol. i. p. 735.

* So called from its snow-white flowers. (*Chion*, snow, and *anthos*, a flower.)

*α* CHIONANTHUS (latifolia,) *foliis orato-ellipticis.*—AIT., Kew., vol. i. p. 22. *C. maritima.*—PURSH, vol. i. p. 8.

*Amelanchier Virginiana, lauro-cerasi folio.*—PLUK., Sici., p. 241. CATESBY, Carol., vol. i. p. 68, t. 68.

*β* CHIONANTHUS, (angustifolia,) *foliis lanceolatis,* (Narrow-Leaved Fringe Tree.)—AIT., Kew., vol. i. p. 22.

THIS beautiful tree attains the height of twelve to twenty feet, with a diameter of ten to twelve inches. When in flower, which is here about the commencement of June, few objects can be seen more singular and elegant; the panicles of pendent flowers with which it is then clad give it the appearance of a mass of snow-white fringe, and, when the flowers fall, the ground seems covered with a carpet of white shreds. It is also highly ornamental when in fruit, presenting among its broad, deep green leaves, numerous clusters of dark purple drupes, which look like so many small plums, but are not agreeable to the palate. Mr. Elliott mentions a variety in a garden near Charleston, (that of Mr. Champney,) in which the panicles of flowers were so long and numerous that they appeared cylindrical. The variety *β C. angustifolia* of Aiton, with narrow oblong-lanceolate leaves, and smooth beneath, appears to be a distinct species, and takes a more southern range.

The farthest-known northern station of this tree is in the woodlands on the borders of the Brandywine, near West Chester in this State, where it was observed, many years ago, by my late friend David Landreth, Sr.: it is therefore perfectly hardy to the northern limits of the United States. To the south, it is met with as far as Florida, and appears to be replaced in Mexico by the *C. pubescens* of Humboldt, Kunth, and Bonpland; but in that species the flowers are larger and red.

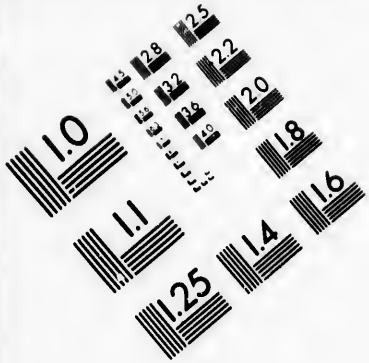
Of the quality of its wood nothing is yet known, nor is it sufficiently common for economical purposes. According to Elliott, the root is used, in form of an infusion, as a remedy in long-standing intermittents.

The tree presents a roundish spreading summit; the leaves are opposite, petiolate, oval, pointed at either end, entire; green and smooth above, pubescent beneath, six or seven inches long by about three wide. The white flowers come out in pendent paniculated racemes, of which the extreme ramifications are usually three-flowered. The fringe-like petals are eight or nine inches long, sometimes with six divisions instead of four, and as many as four stamens. It grows generally in humid places, near swamps and streams, and bears cultivation extremely well. In the fine old garden of the Bartrams, at Kingsessing, there is a tree of this species which has been growing nearly a century, and is now thirty-two inches in circumference and about twenty feet high.

A species very much resembling the present, the flowers equally loose and trichotomal, but with thick, smooth, coriaceous leaves, according to Poiteau, inhabits the island of St. Domingo, and will probably be met with in East Florida.

## PLATE XCVIII.

*A branch of the natural size. a. The fruit.*



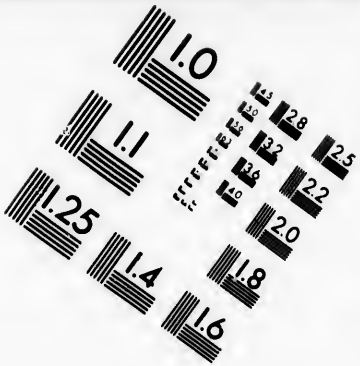
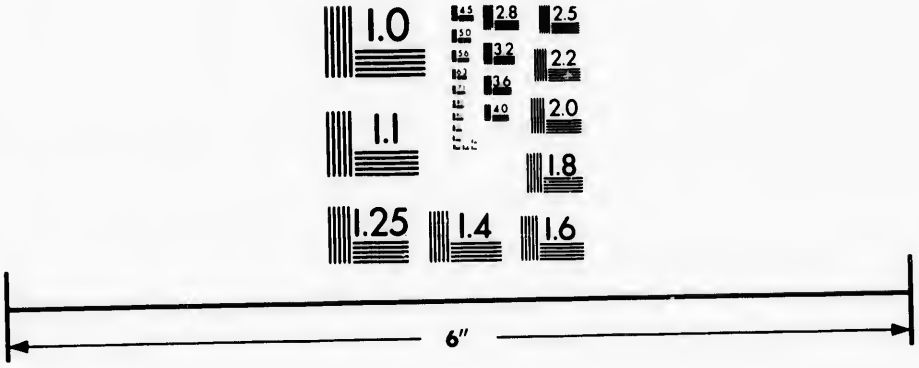
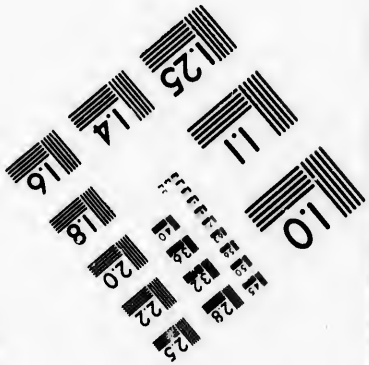




**IMAGE EVALUATION**
**TEST TARGET (MT-3)**



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# ASH TREE.

(Frene, Fr.)

---

*Natural Order*, Oleine.e. *Linnæan Classification*, Diœcia, Diandria.

FRAXINUS. (Linn.)

Male flowers with a minute 3 or 4-toothed calyx or that part wholly wanting. *Corolla* none. *Stamens* two to four. *Pistillate flowers* equally imperfect. *Ovary* superior, ovate, compressed, 2-celled, the cells each with two ovules. *Capsule* (or Samara) compressed, 2-celled, by abortion 1-seeded, terminating in a membranous lanceolate wing.

The Ashes are trees of the northern hemisphere, and almost entirely confined to Europe and North America. The leaves are opposite and pinnate; the flowers diœcious and paniculate, rarely racemose. The leaves of some of the species in warm climates exude the saccharine substance called *manna*. The wood of several species of this genus is much esteemed for its strength and elasticity.

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## OREGON BLACK ASH.

Fraxinus Oregona. *Foliolis subseptenis sessilibus, ovato-lanceolatis acutis subserratis integrisve cum rachibus petiolisque pubescentibus concoloribus, floribus coliculatis, samaris brevibus cuneatis emarginatis basi angustatis.*

β riparia *foliis magis serratis, samara lanceolata integra.*

, Di-

holly
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almost
es are
rarely
exude
species

*is acutis*
*oloribus,*
*pusatis.*

Fraxinus Oregona

*Oregon Black Ash* *Frene de l'Oregon*

This is the only species of Ash we met with in the Oregon Territory. It becomes a large and useful tree, seventy or eighty feet in height, and always affects wet or low alluvial lands, many of which are subject annually to temporary inundations. We never saw it above the first falls of the Oregon, which would appear to be its limit, or nearly so, in this direction, and we believe it is not known in Upper California.

The leaves are eight to ten inches in length; the lateral leaflets, about three pair, are two and a half to three inches long, the terminal leaf about four inches, the breadth about one and a half inches; they are ovate-lanceolate, acute, but scarcely acuminate, sessile, entire, or now and then slightly serrate, on both surfaces pubescent, but particularly beneath as well as the midrib, and nearly of the same color on both sides.

The male flowers are thickly clustered, the flowers with two or three oblong-obtuse stamens, and a very minute calyx. The female panicles are smooth, trichotomous, and many-flowered, with the rachis flat and compressed. The calyx small and 4 to 5-toothed; the style rather long, with two revolute stigmas; no corolla. The germ subquadrangular, anciptal, two-celled; cells each with two ovules. The samara is rather wide, cuneate-oblong, emarginate, and narrow at the base, subtended by a minute irregularly-toothed calyx; it is only about an inch and a line long. In the White Ash it is sometimes near upon three inches. In our variety $\beta$ the samara is somewhat longer, and generally acute and entire at the tip.

The wood of this fine species is nearly white, and found no way inferior to that of the White Ash, being used for the same purposes at Fort Vancouver and among the settlers of the Wahlamet. It was much esteemed for oars as well as for the handles of all sorts of implements, and found tough and durable. Though allied to the Black Ash (*F. sambucifolia*) by botanical affinities, it is very superior as timber, and is justly considered as one of the best in the territory.

An opinion prevails in Oregon among the hunters and Indians that poisonous serpents are unknown in the same tract of country where this Ash grows; and stories are related of a stick of the Black Ash causing the rattlesnake to retire with every mark of fear and trepidation, and that it would sooner go into the fire than creep over it. It is singular to remark that the same superstition in regard to the European Ash prevailed even in the time of Pliny the natural historian.

PLATE XCIX.

*A branch of the natural size. a. The germ. b. The fruit. c. A variety with lanceolate fruit.*

---

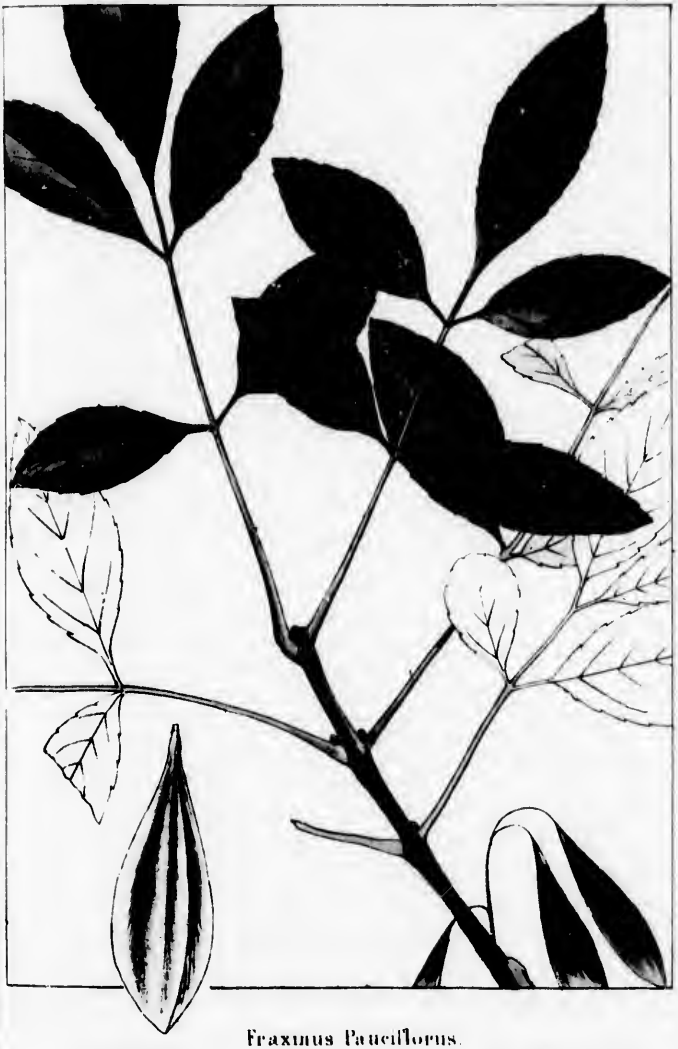
## SMALL-LEAVED ASH.

FRAXINUS PAUCIFLORA. *Ramis glabris gracilibus, foliolis quinis ad septenis lanceolatis remotis longe petiolatis utrinque acuminatis leviter serratis glaberrimis, racemis fructiferis simplicibus, pauciforis.*

THIS remarkable species of Ash was collected in Georgia, in the neighborhood of "Trader's Hill," by the late indefatigable and excellent botanist, Dr. Baldwin. Specimens exist in the Herbarium of the Academy of Natural Sciences of Philadelphia. It appears to have been observed by no other botanist.

The character of the tree and the quality of its timber are unknown, but the figure and description may probably serve to recognise it and lead to further inquiry.

The branches are smooth and remarkably slender, the buds small, yellowish brown, and pubescent. The leaves are half a foot or a little more in length, with five to seven lanceolate leaflets, which are two to two and a half inches long by about



Fraxinus Pauciflorus.

*Small leaved Ash* *Frêne à petites Fleurs*

three-quarters of an inch wide, acuminated with a slender point, and much attenuated below, with rather long pedicels; they are opaque, smooth and green on both surfaces, except a slight trace of pubescence alongside of the midrib, and slenderly serrated on the margin; the petioles are remarkably long, and the distance between the pairs of leaves very great; but the most characteristic distinction claimed for this species is in the inflorescence of the fruit-bearing plant, which consists of two or three remote pairs of racemes, each being quite simple or unbranched, terete, and producing only two or three samaras or capsules in place of the usual trichotomous and compound cluster.

The samara is about one and a half inches long, lanceolate, obtuse, and entire, attenuated and cylindric at the base, and without any proper calyx, there being a mere margin of junction with the pedicel.

PLATE C.

*A branch of the natural size, with the fruit.*

---

## THREE-WINGED ASH.

FRAXINUS TRIPTERA. *Samara latissima oborato-elliptica, plerisque trialata, basi angustissima, ecaliculata; foliolis.*—NUTT., vol. ii. p. 232.

I OBSERVED fruit of this curious species many years ago, in winter, in the Oak forests of South Carolina, and, as I thought, the leaves of the same; but I am now in doubt whether the leaves then collected actually belonged to the same plant with the fruit. I must therefore leave the species in the same imperfect manner I then found it, as I have never since seen any other specimen.

The fruit is the most curious of any in the genus, at first sight almost similar to that of an Halesia, being nearly of the same breadth; the samara, in fact, appeared to be more rarely 2 than 3-winged; the seed itself was also three-sided; at the base the fruit is attenuated into a very slender peduncle without being at all terete. Perhaps it is merely a variety of *F. platycarpa.*

PLATE C.

*The fruit, which is three-winged.*

---

Blue Ash, (*Fraxinus quadrangulata.*) Mr. T. Lea, of Cincinnati, informs me that he measured a tree of this species which was cut down in his neighborhood, which was one hundred and four feet high, thirty-two inches in diameter, and its age by the concentric circles was 252 years. The diameter under the bark was thirty inches. Another growing near to it was about thirty-six inches in diameter, and proportionably high; they were both healthy trees, and had not attained their greatest size.

Besides the valuable uses of the Ash as timber, for which it has been employed from the highest antiquity, it was formerly used as a medicine, and thought to be equal to the wood of the Guaiacum, by Bauhin, who also remarks that the inner bark of the common species (*F. excelsior*) steeped in water communicates to it a blue color in the same manner as our Blue Ash, (*F. quadrangulata;*) yet it is not known whether it can be used in dyeing. It was formerly considered as a diuretic of considerable efficacy; the bark and the wood is still known to be a mild purgative, no less than the manna which distils from its incisions in the warmer parts of Europe. Most part of the manna of commerce is collected in Calabria and Sicily, from the Round-leaved Flowering Ash, (*Ornus rotundifolia.*) The manna exudes

spontaneously in fine weather, from the middle of June to the close of July. During the heat of the day we observe a transparent liquor issuing from the trunk and the branches, which thickens and becomes clotted; these indurated exudations are nearly white, and are collected the following morning with a wooden knife, provided they have not already dissolved to water, as a humid fog is often sufficient to melt it. It is finally dried in the sun, and is what is known by the name of *manna in tears*. At the close of July, when the spontaneous exudation ceases, the peasants make incisions in the bark of the Ash, from whence issues during the heat of the day a great deal of liquor which thickens in large flakes, and produces an inferior manna of a brownish color, which, however, purges more than the preceding.

Several species of Ash afford manna as well as the Ornas.

The shade of the Ash is found destructive to other plants, and its roots impoverish the soil to a great degree; indeed, the ancients imagined the shade of this tree unhealthy. On the other hand, it will thrive in the shade of other trees, and may be planted in the interior of a clump where scarcely any other tree will survive.

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WHITE ASH, (*Fraxinus acuminata*, LAMARCK. *F. Americana*, WILLD. *F. epiptera*, MICH., Flor. Bor. Am., vol. ii. p. 256.) This tree grows from fifty to seventy feet high, and sometimes two to three feet in diameter. The wood is said by Michaux to be preferred to that of other species. Mr. Elliott, however, remarks that he believes they are all indiscriminately used.

---

CAROLINIAN or BROAD-FRUITED ASH, (*Fraxinus platycarpa*, MICH., vol. ii. p. 256.) Mr. Elliott remarks, "I think it sometimes becomes a large tree."

# FLOWERING ASH.

(Frene à Fleur, Fr.)

---

*Natural Order*, Oleine.e. *Linnæan Classification*, Diandria, Monogynia.

ORNUS. (Persoon.)

*Calyx* 4-parted or 4-toothed. *Corolla* 2 to 4-parted, the segments usually elongated. *Stamens* exserted. *Stigma* emarginate. *Samara* 1-celled, 1-seeded, winged.

Trees, natives of Europe, Asia, and Western America, with opposite, unequally-pinnated leaves, and terminal or axillary panicles of flowers, scarcely distinguishable from the Ash but by the presence of a corolla.

## CALIFORNIAN FLOWERING ASH.

Ornus dipetala. *Foliis 3-jugis, foliolis cuneato-ovatis serratis obtusis glabris, paniculis axillaribus, corolla dipetala, antheris elongatis, filamentis brevibus.*

Ornus dipetala.—*Hooker* and *Arnott*, in Botan., Beech., t. 87.

Fraxinus (*Ornus*) dipetala. *Foliis 3-jugis, foliolis ovalibus obtusis acute serratis glabris basi cuneatis, inferioribus in petiolulum longiuscatum attenuatis, superioribus duobus sessilibus, supremo longe petiolulato, paniculis multifloris longitudine fere foliorum ac infra folia ortis, petalis 2 obovato-oblongis obtusis unguiculatis.*—Hook., in Bot. Beech. Suppl., p. 362.

Ornus Dipetala.

*Californian Flowering Ash* — *le Frene à fleurs de Californie.*

Specimens of this curious tree were collected (probably) by Douglas in the forests of Upper California. The flowers appear less showy but more curious than those of the Common Flowering Ash, (*Ornus Europæa.*) The leaflets appear to be small and distant from each other, smooth, of an elliptic-ovate figure, with small and distinct, sharp serratures. The flowers are small, and come out in ramified clusters from the axils of the leaves; they have a distinct, four-toothed calyx, and two oblong, obtuse, spreading petals about the length of the stamens. The stamens do not appear to be exserted as in the European Ornus; the anthers are also very large and long, and the filaments so short as not to appear beyond the calyx. The germ is ovate, and the stigma merely notched.

Of this curious plant, we have seen nothing more than the plate and specific character as given before. The author remarks that it is allied to *F. Schiedianus* of Schlectendal, described in the Linnæa., vol. vi. p. 391, a Mexican plant; but the petals of that species have not yet been observed.

PLATE CI.

*A branch of the natural size. a. The flower magnified. b. The germ, also magnified.*

---

The Ornus Americana of Pursh, Flor. Bor. Am., vol. i. p. 8, is given on the authority of Persoon, who merely notices it as a variety of the European Ornus, and cautiously places an interrogation after *Americana?* giving at the same time no locality. Pursh, however, adds, "In moist, shady woods: Maryland and Virginia, rare, ♄ May, *v. v.*" Yet, with all this assertion, it continues, as far as I know, to rest wholly on the authority of Pursh, no other botanist having pretended to find this obscure plant, which, in all probability, is nothing more

than a name bestowed upon a mere variety of the European Ornus, by gardeners, for the purposes of profit.

---

Note.—The Olive Tree, (*Olea Europæa.*) The cultivation of the Olive has been attended with the greatest success in Upper California, and the olives produced are of an excellent quality. It might also, no doubt, be cultivated in the southern part of the Oregon Territory. Around Santa Barbara, the Olive Trees were in full flower in the latter end of March and beginning of April, and put on the appearance of a willow grove. Forty barrels of these pickled olives were shipped from St. Diego to Boston in the Alert, the vessel in which I returned to the United States in 1836.

Ardisia Pickeringia.

*Florida Ardisia* *Pinckney del Pickering*

# ARDISIA.*

(SWARTZ.)

---

*Natural Order*, MYRSINEÆ, (R. Brown., *Linnæan Classification*, PENTANDRIA, MONOGYNIA.

*Calyx* 5-parted, persistent. *Corolla* monopetalous, 5-parted, reflected. *Anthers* large, erect. *Stigma* simple, acute. *Drupe* superior, the nut 1-seeded.

Trees or shrubs of Tropical America and India, with alternate, thickish or coriaceous leaves: flowers terminal, paniculated, or in axillary cymes or umbels.

---

## FLORIDA ARDISIA.

ARDISIA PICKERINGIA. *Paniculis axillaribus terminalibusque, foliis cuneato-oblongis integris coriaceis acutis, calycibus abbreviatis, caule arboreo.*

CYRILLA *paniculata*.—NUTT., in Silliman's Journ. Sci., vol. v. p. 290.

PICKERINGIA *paniculata*.—IBID., Journ. Acad. Nat. Sci., Philad., vol. vii. p. 95.

THIS beautiful evergreen tree, according to Dr. Blodgett, is very common at Key West, where it attains an elevation of

* A name derived from *ἀρδις, a point*, on account of the acute segments of the corolla.

twenty feet. Many years since, it was discovered in East Florida, about the latitude of 28°, by my friend Major Ware, but, from the imperfection of the specimens, I was led to mistake its character, and form upon it a distinct genus. It bears a very considerable affinity to the *Ardisia coriacea* of Swartz, but differs wholly in the flower, and in the smallness of its calyx; the leaves are also longer in proportion to their width.

The leaves, resembling those of a laurel, but smaller, grow out toward the extremities of the branches, which are covered with a dark-brown bark: they are from three to four inches long and an inch or more wide, very entire, oblong or ovate-oblong, obtuse, and narrowed below into a short petiole, so thick and opaque as to exhibit scarcely a vestige of veining above, and in this respect very different from *A. tinifolia*, which has also much larger leaves. The flowers are showy and rather large, white, with a purple tinge, and disposed in axillary and terminal panicles, made up of racemes. The calyx is not more than one-third the length of the corolla, with five obtuse, imbricated, spotted leaflets with membranous margins. The segments of the corolla are ovate, obtuse, and reflected, with dark-brown, almost black, narrow, longitudinal blotches. The anthers are large, flat, and cordate, not quite so long as the corolla. The style is subulate and acute. The branches of the panicle are of a ferruginous-brown color and pulverulently pubescent.

According to Sloane, the drupes of *A. coriacea* (t. 200, fig. 2) were eaten in Jamaica, and accounted a pleasant dessert.

## PLATE CII.

*A branch of the natural size. a. The flower somewhat enlarged.*

**Crescentia Cujete**

*Long leaved Calebash Tree* *Calabassier Cujete*

# CALABASH TREE.

(Calabassier, Fr.)

---

*Natural Order*, Solaneæ. *Linnæan Classification*, Didynamia, Angiospermia.

CRESCENTIA.* (Linn.)

*Calyx* 2-parted, equal, and deciduous. *Corolla* large, somewhat campanulate, the tube unequal, ventricose and in-curved, the border 5-cleft, unequal, its segments denately sinuate or torn. *Stamens* four, (sometimes five,) as long as the corolla, two of them shorter, anthers incumbent. *Stigma* bilamellate. The *berry* large, 1-celled, resembling a gourd, with a solid bark, within pulpy, many-seeded.

Trees or shrubs of Tropical America and the Caribbean Islands; the leaves large, alternate, and fasciculated, the flowers mostly solitary, arising from the trunk or branches.

---

## LONG-LEAVED CALABASH TREE.

Crescentia cujete. *Foliis cuneato-lanceolatis confertis.*—Swartz., Obs., p. 234. Linn., Sp. pl. Willd., vol. v. p. 311. Laefling's Iter., p. 225. Jacq., Amer., p. 175, t. 111.

*C. arborescens, foliis confertis oborato-oblongis basi angustioribus, fructu sphærico maximo.*—Browne, Jam., p. 265.

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* Named in memory of Pietro Crescentio, an Italian writer on Agriculture.

Cujete *foliis oblongis et angustis, magno fructu ovato.*—Plumier, Gen. 23, ic. 109.—Piso, Brazil, p. 173.

*Arbor Americana cucurbitifera, folio longo mucronato, fructu oblongo.*—Commel., Hort. Amst., vol. i. p. 137, t. 71.

This species attains the ordinary height of a Pear Tree, being twenty to twenty-five feet high, and about a foot in diameter, with the trunk crooked and dividing with great regularity at the top into numerous, long, thick, almost horizontal branches. It is indigenous to the Antilles, New Spain, Guiana, and Brazil, and has also been recently found at Key West, by Dr. Blodgett. The wood of this species is said to be white, hard, and susceptible of a polish. In the countries it inhabits it is commonly employed for saddle-trees, stools, chairs, and other articles of furniture. The fruit varies in form and size from ovoid to round, and is from two inches to a foot in diameter; it is covered with a thin, even, smooth skin of a greenish yellow, and under this there is a hard and ligneous shell, which contains a soft yellowish pulp of an acrid and disagreeable taste, which is, however, considered as a good remedy in a great number of diseases and accidents, being employed for dropsy, diarrhœa, and inflammations of the chest; applied externally, it is thought serviceable in bruises, burns, and headaches. Cattle occasionally feed on the fallen fruit, as did the Indians in time of scarcity. In an unripe state it is also candied with sugar. The Indians made use of them, when hollowed out, for rattle-boxes in their noisy superstitious ceremonies, in the same manner as our northern aborigines used the calabash for the same purpose. Alvaro Nunez speaks of their being thus employed in Florida. Hughes remarks that the fruit smells like wine, and that the juice is even relished by some as a beverage.

The shell of the fruit, emptied of its pulp, is used in the West Indies for various kinds of domestic vessels, such as goblets, coffee-cups, tobacco-boxes, dram-bottles, &c., and, it is said, even for kettles to boil water in, it being so thin, hard,

and close-grained, as to stand the fire several successive times before it is destroyed. The external surface is sometimes finely polished and ornamented with figures, colored with indigo, rocou, and other pigments.

The "Mexican Chronicle," published by *Purchas*, (p. 1092.) records that the shells of this fruit, out of which they drank their *cacao*, were rendered as a tribute to the Mexicans from the towns of their hot countries who were their subjects.

The leaves grow out in clusters of nine or ten together, at unequal distances, and are from five to seven inches long and about an inch broad, narrowing very gradually toward the base, where they are almost sessile, ending in a rather long and acute point; they are also entire, very dark green, smooth, and rather shining. The flowers come out on the trunk and branches, are of a dull greenish yellow, about one and a half inches long, marked with brownish streaks or veins, solitary, and of a disagreeable smell; the tube is almost globosely ventricose, with the border five-cleft, each of the divisions trifid, in long, filiformly-acuminated segments, the central one being longest. The stigma is deeply bilamellated.

## PLATE CIII.

*A twig of the natural size, with a flower.*

# TRUMPET FLOWER.

(Bignone, Fr.)

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*Natural Order*, Bignoniace.e, (R. Brown.) *Linnæan Classification*, Didynamia, Angiospermia.

TECOMA.* (Jussieu.)

*Calyx* campanulate, 5-toothed. *Corolla* with a short tube, toward the orifice campanulate, the border 5-lobed, unequal or bilabiate. *Stamina* four, didynamous, with the rudiment of a fifth. *Stigma* bilamellate. *Capsule* long and cylindric, resembling a pod, 2-celled, with the dissepiment in a *contrary direction* with the valves. *Seeds* transversely disposed in a double series, imbricated and winged.

Very ornamental trees, or rarely shrubs, mostly climbing or twining, often producing hard and valuable wood, inhabiting the tropics of either hemisphere; the present species (*T. radicans*) extending farther north than any other known. The leaves opposite, mostly unequally pinnate; the flowers terminal, clustered, or paniculate, yellow or red.

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## COMMON TRUMPET FLOWER.

Tecoma radicans. *Foliis pinnatis; foliolis ovalibus dentatis acuminatis; corymbo terminali; tubo corollæ calyce triplo longiore, caule genicalis radicatis.*

Tecoma radicans.—Jussieu, Genera Plant., p. 155.

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* From *Tecomaxochitl*, the aboriginal Mexican name of one of the species.

Tecoma radicans.

*Common Trumpet Flower* *Bignone de Virginie*

Bignonia radicans.—Linn., Hort. Cliff., p. 317. Willd., Sp. pl., vol. iii. p. 301. Walter, p. 169. Mich., Flor. Bor. Am., vol. ii. p. 25. Pursh, Flor., vol. ii. p. 420. Elliott, Sk., vol. ii. p. 108. Curt., Magaz., t. 485. Nouv. Duhamel, vol. ii. p. 9, tab. 3. Miller, Icon., t. 65. Wangenh., Amer., p. 68, tab. 26, f. 53.

Bignonia *fraxini foliis, coccineo flore minore.*—Catesby's Carolina, vol. i. p. 65, tab. 65.

Bignonia *Americana, fraxini folio, flore amplo phœniceo.*—Tournefort, p. 164.

*Gelseminum hederaceum Indicum.*—Cornut., Canad., p. 102, tab. 103.

*Pseudo-Apocynum hederaceum Americanum, tubuloso flore phœniceo, fraxini folio.*—Morris, Hist., vol. iii. p. 612, f. 15, tab. 3, f. 1.

*Gelseminum clematitis, &c.*—Barrel, Ic., 59.

This beautiful climber is indigenous to all the States south of New York, and westward to the borders of the Mississippi. By means of the radicant fibres of the stem it clings to trees and walls, ascending to the height of from thirty to fifty or sixty feet. In favorable situations the main stem thickens and takes an independent stand, so as sometimes to produce a woody trunk twenty feet high and three feet in circumference, with a deeply-furrowed gray bark. About midsummer, it sends out from its elevated summit a bright green mass of long, depending twigs, producing from their extremities, for a long succession, clusters of large, brilliant red flowers, something in the form of trumpets, to which are continually attracted flocks of young humming-birds in quest of the honeyed repast they so long afford. As a hardy, ornamental, climbing tree, few plants deserve better to be cultivated along walls and trellises. In the Bartram Garden (Kingsessing) there is one of these trees, probably a century old, with a thick, short, and nearly erect stem, its summit spreading out into an independent, airy bower. A familiar retiring-place for three generations of the family, it scarcely presents any sign of decay, being only stunted by the thinness of the soil in which it grows. May

the venerable groves and splendid and curious trees of this patriarchal residence long survive the waning existence of its present proprietors! But I fear the love of change and of gain will, at no distant date, turn these remarks and references into a matter of mere historical recollection in place of existing facts.*

The wood of this species appears to be hard and fine-grained, but it is nowhere in such quantity as to make it an object of economy. That of some of the tropical species is highly esteemed for its durability and hardness.

The leaves, which drop off in winter, are opposite, unequally pinnated, with four or five pairs of leaflets; these are oval, long-pointed, serrated and acuminated, smooth above, beneath a little hairy along the vessels. The flowers are large and of a bright red, with the tube inclined to yellow, disposed in clusters at the extremities of the branches and coming out in a long succession. The corolla is partly funnel-formed, with the tube about twice the length of the calyx. The capsular pods, somewhat cylindric, are about six to seven inches long, about an inch wide, and pointed at each end.

This species was introduced into England as early as the year 1640. According to Loudon, there is one of the finest specimens known in Europe trained against the Palace Pitti, at Florence, which in 1819 was upward of sixty feet high.

## PLATE CIV.

*A branch of the natural size.*

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CATALPA, (*Catalpa syringæfolia*, SIMS., Bot. Mag., t. 1094. *Bignonia Catalpa*, MICH., Sylva, vol. i. t. 61.) In a journey

* Since this was written, "Bartram's Garden" has been purchased by Col. Eastwick, and its trees and principal features happily preserved, at least for the benefit of the present generation. Let us hope. J. J. S.

which I made into Georgia, Alabama, and West Florida, in 1830, at Columbus in Georgia, on the banks of the Chattahoochee, I for the first time in my life beheld this tree decidedly native, forming small, haggard, crooked trees leaning fantastically over the rocky banks of the river. Around Philadelphia, and other parts of the Middle and warmer States, it appears to be perfectly naturalized and very common, particularly in rocky and gravelly soils. It is a tree of rapid growth, with the wood remarkably light, grayish white, of a fine texture, capable of receiving a brilliant polish, and when properly seasoned it is very durable. The bark is said to be tonic, stimulant, and more powerfully antiseptic than the Peruvian bark. The honey collected from its flowers, like those of the Gelseminum, is said to be poisonous.

# AVICENNIA.

(Avicenne, Fr.)

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*Natural Order*, Myoporinæ, (R. Brown.) *Linnæan Classification*, Didynamia, Angiospermia.

AVICENNIA.* (Linn.)

*Calyx* 5-parted, permanent, leaflets subovate, concave, erect. *Corolla* monopetalous, with the tube short and campanulate; the border somewhat two-lipped; the upper lip truncate, flat, and emarginate; the lower trifid, the segments ovate, equal, and flat. *Stamens* four, with subulate filaments inclined to the upper lip, the anterior pair shorter; *anthers* roundish, 2-celled. *Stigma* bifid, acute, the lowest division reflected. *Pericarp* a coriaceous, somewhat rhomboidal, compressed capsule of one cell, with two valves. *Seed* one, large, without albumen, taking the form of the capsule, the cotyledons in four broad, fleshy folds, germinating while on the tree; radicle inferior, bearded.

Maritime tropical or subtropical trees with opposite entire leaves: flowers in small terminal and axillary panicles, with the calyx subtended by three bractes. A genus of three species, chiefly indigenous to New Zealand, Tropical India, and America.

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* So named after the famous Oriental physician Avicenna.

Avicennia tomentosa

*Soft leaved Avicennia* *Avicenne Cotonneux*

# SOFT-LEAVED AVICENNIA.

AVICENNIA TOMENTOSA, (*Jacquin.*) *Foliis oblongis obtusis subtus tomentosis.*—WILLD., Sp. pl., vol. v. p. 395. JACQ., Am., t. 112. PALIS. BEAUV., Flor., t. 47. BROWNE, Prod., p. 518.

BONTIA *foliis integris oblongis oppositis, petiolis crassis brevissimis subamplexantibus, floribus racemosis.*—BROWNE, Jamaica, p. 263.

HALODENDRUM.—*Thouar's* Gen. Madagasc., No. 26.

MANGLE *lauro-cerasi foliis, flore albo tetrapetalo.*—SLOANE, Jam., p. 156; Hist., vol. ii. p. 66. RAJ., Dendr., p. 115.

ANACARDIUM.—*Bauhin*, Pinax., p. 511. OEPATA., *Rheed*, Malab., vol. iv. p. 95, t. 45. SCEURA, Forsk. Ægypt., p. 37.

MANGIUM *album.*—RUMPH., Amboin., vol. iii. p. 115, t. 76.

RACK.—*Bruce*, Iter., t. 34.

THE Avicennia or Malacca Bean, according to Rheed, becomes a tall and graceful tree on the coast of India, rising to the height of seventy feet, with a trunk of sixteen feet in circumference, sustaining a pyramidal and somewhat orbicular summit of dense and dark verdure. The wood is whitish, covered with a gray bark, and is employed for many economical purposes. The kernels, naturally bitter, deprived of this quality by steeping and boiling in water, are then sufficiently edible, and known to the Hindoos by the name of *caril:* an oil may also be expressed from them as from the nuts of the Anacardium.

The leaves are opposite, lanceolate-oblong, obtuse or lanceolate and acute, entire, smooth, and shining above, on short petioles, beneath more or less whitish with a short close tomentum; they are about three inches long, and from an inch to an inch and a half wide. The flowers are rather small and whitish, with an agreeable odor, and disposed at the summit and axils of the branches in panicles or short racemes which grow often three together; the divisions of the paniele, as in the branches, are opposite; the pedunceles and the calyx are whitish

and tomentose. The fruit resembles in form, and is nearly the size of, an almond.

Scarcely any tree is more widely disseminated throughout the tropics than the Avicennia; it is commonly associated with the Mangle or Mangrove, affecting the saline borders of the ocean in India, America, nearly all the groups of the South Sea islands, and extends on our part of the continent from Texas to Florida, and New Orleans, near to the estuary of the Mississippi, where it may often be seen brought in the oyster and fishing boats and called usually the Mangle. The roots spread out in all directions in arches over the surface of the soil, and send out, from the mire in which they grow, numerous erect naked shoots, resembling asparagus in appearance. I have not been able to ascertain its size on our coast, but I believe it attains there a much smaller elevation than in India. In the herbarium of the Academy of Natural Sciences are fine specimens from Surinam, collected by Dr. Herring. In these nearly all the leaves are acute, and are furnished with conspicuous, rather long petioles; yet, as on the same specimens some bluntish leaves may also be seen, it probably merely constitutes a variety which may be termed *A. tomentosa* β *longifolia*. The plant of India seems truly identic with our own.

Forster discovered in New Zealand a third species, which he calls *A. resinifera*, from its trunk transuding a green-colored gum, which the natives esteem as food. In other respects it scarcely differs at all from the present species.

## PLATE CV.

*A branch of the natural size. a. The flower. b. The fruit.*

Cordia Sebestena.

*Rough-leaved Cordia* *Sebestier Domestique.*

# CORDIA.*

(Plumier, Linn. Sebestier, Fr.)

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*Natural Order*, Cordiaceæ, (R. Brown.) *Linnæan Classification*, Pentandria, Monogynia.

*Calyx* tubular or campanulate, 5-toothed or 5-cleft. *Corolla* mostly funnel-formed, the tube as long or longer than the calyx; the border usually 5-lobed and more or less spreading. *Stamens* five or more. *Style* once or twice bifid, with obtuse stigmas. *Drupe* globular or ovate; the *nut* 2 or 4-celled, some of the cells often abortive, cells 1-seeded.

These are trees or shrubs chiefly of Intertropical India and America, with alternate leaves, the flowers disposed in axillary or terminal corymbs or panicles, and subject to vary in the number of their parts.

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## ROUGH-LEAVED CORDIA.

Cordia Sebestena. *Foliis oblongo-ovatis repandris scabris.*—Hasselquist, Iter., p. 458. Miller, Dict., No. 1. Willd., Sp. pl., vol. ii. p. 1073. Plum., Gen., p. 13, ic. 105. Lam., Illust., tab. 96, fig. 1. Botan. Magaz., t. 794. Botan. Repos., t. 157.

Cordia *foliis amplioribus hirtis; tubo floris subæquali.*—Browne, Jamaic., p. 202.

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* Named by Plumier in honor of Euricius Cordus and his son Valerius, two German botanists of the sixteenth century. Sebestena is from the Persian name *Sebestan*.

Serestena *scabra, flore miniato crispa.*—Dillen, Hort. Eltham, p. 341, t. 255, f. 331.

*Caryophyllus spurius inodorus, folio subrotundo scabro, flore racemoso hexapetaloide coccineo.*—Sloane, Jam., 136; Hist., vol. ii. p. 20, t. 164. Raii, Suppl., p. 86. Catesby, Carol., vol. ii. p. 91, t. 91.

*Narella nigra.*—Rumph., Amboina, vol. ii. p. 226, t. 75. Burm., Ind., p. 59.

This fine ornamental species is a native of the East and West Indies, and has recently been observed on Key West in East Florida, by our friend Dr. Blodgett. It becomes a tree about the size of an ordinary Apple Tree, with a spreading dark-green summit, and affords, in the tropical regions it inhabits, a most agreeable shade. Bruce remarks that in Abyssinia, and in other parts of Africa, this or a nearly-allied species is held sacred, and commonly planted before the houses of the inhabitants. Without being venerated, it is in the Sandwich Islands a favorite tree of common occurrence in the vicinity of the habitations, and admired for the beauty of its flowers.

The leaves are large, ovate-oblong, and scabrous to the touch, nearly entire when fully expanded. The flowers are deep yellow or orange, in large terminal corymbose racemes, in form very much resembling those of the Marvel of Peru, (*Mirabilis,*) being funnel-shaped, with the border of five or six oval-obtuse, waved, and crenulated divisions. The stamens are five, and the stigmas are twice bifid. The fruit is a round or pyriform drupe, containing a deeply-furrowed nut.

According to Catesby, the wood of this species is of a dark brown, approaching to black, very ponderous, and containing much gum, in smell and appearance resembling that of Aloes, and it is by the inhabitants of the Bahama Islands, where it grows, called Lignum Aloes. Browne says, that a small piece of the wood put on a pan of lighted coals will perfume a whole house. From the juice of the leaves, mixed with that of a species of fig, is prepared the fine red color with which the

Cordia floridana.

*Florida Cordia* *Sebestier des Florides*

natives of Tahiti dye their tapas or cloth. The drupes are said to be eatable, and also to afford an excellent glue when they are ripe. A syrup of the fruit is, in the East, reputed as a remedy for the same diseases as that of the *Cordia Myxa*.

PLATE CVI.

*A branch of the natural size.*

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# FLORIDA CORDIA.

CORDIA FLORIDANA. *Foliis oblongis oboratis parvulis integris scaberrimis subtus glabris, corymbis terminalibus dichotomis, stylis bifidis.*

THIS species, which does not appear to be described, was found at Key West in East Florida, by our friend Dr. Blodgett, who remarks that it becomes a tree of twenty feet elevation; and, if at all like the *C. gerascanthus* or Spanish Elm of Jamaica, is entitled to consideration as an excellent timber.

The twigs in our plant are slender and diverging, covered with a brownish gray, smooth bark. The leaves appear to be thick and rigid, as in evergreens, an inch to an inch and a half long, by a half to three-quarters of an inch wide; they are oblong or obovate, obtuse, and often rounded above, narrowed below into a minute petiole, very scabrous on the upper surface, dark green and shining, beneath paler and very smooth, as well as the young twigs. The flowers, rather conspicuous, are bright yellow, and formed into a terminal branching corymb. The calyx is campanulate, with a five-cleft acute border, nearly smooth externally, and villous within. The tube of the corolla extends beyond the calyx; the border is five-lobed, with obtuse, broadish segments, the stamens, five, are linear, long, and acute, situated above the

orifice of the corolla. The drupe is about the size of a pea, and contains a nut with four cells and four seeds. The style is bifid, and the stigmas capitate, flat, and emarginate.

PLATE CVII.

*A branch of the natural size. a. A transverse section of the nut, showing the four seeds.*

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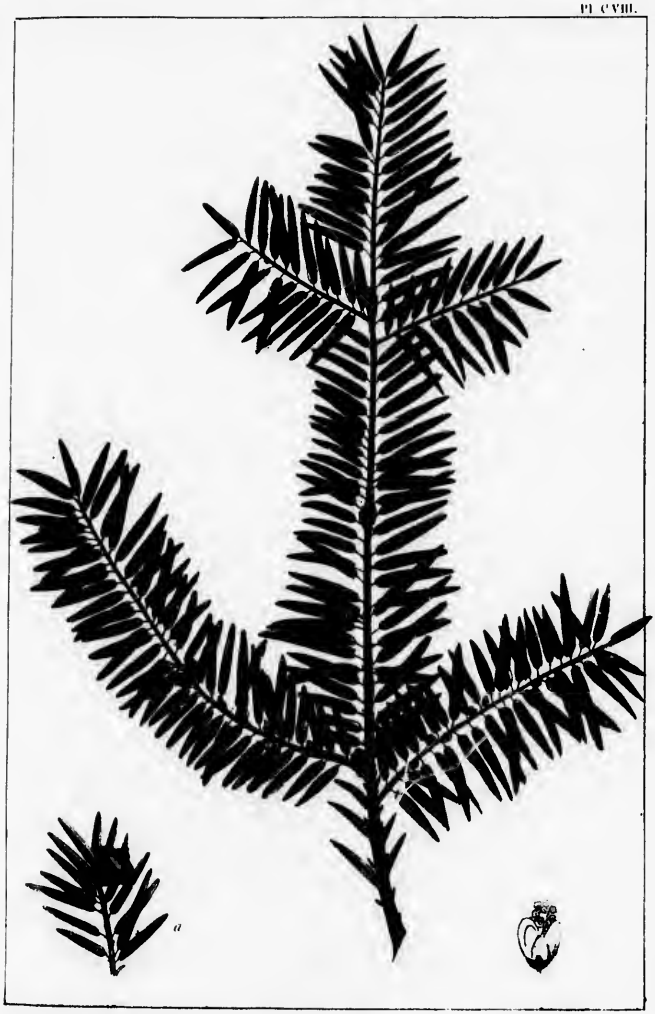
The fruit of the *Cordia Myxa* or Assyrian Plum, which is of an agreeable taste, has been esteemed a valuable medicine in disorders of the chest and urinary passages, but is not now used officinally. The East Indians eat it macerated in salt and vinegar as a remedy for diarrhœa. An excellent glue also is made of the pulp, which is more viscid than that of the jujube. The West India species, *Cordia collococca* or Clammy Cherry, has an edible fruit from which also a glue has been made, and hence also the specific name.




Taxus Occidentalis

*Western Yew* *Canada?*

# THE YEW.

(If, Fr.)

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*Natural Order*, Taxineæ, (Richard.) *Linnæan Classification*, Dœcia, Monadelphia.

TAXUS.* (Tourn. Linn.)

Dœcious.—*Male flower* composed of imbricated bud-scales, connate at base. *Staminiferous* column exserted, the *stamens* six to fourteen, forming a capitate cluster. *Anthers* peltate, 5 to 8-celled, the cells opening from beneath. The Pistillate (or fertile flower) the same as the male, but solitary. The fruit, a nut imbedded in a translucent succulent cup. *Embryo* inverted, in the axis of the perisperm: cotyledons two, very short.

Trees or rarely shrubs indigenous to the temperate and colder regions of both continents; leaves narrow, rigid, acerose and sempervirent, near together and distichally spreading; the buds axillary and sessile, composed of imbricated bractes: the leaves in vernation or before development, appressed.

The plants of the present order, Taxineæ, inhabit temperate climates over the whole globe, but are most frequent in the southern hemisphere; between the tropics of the Old World they also occur, but rarely.

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## WESTERN YEW.

Taxus brevifolia. *Foliis linearibus brevibus planiusculis obtuple mucronulatis distichis, receptaculis masculis subglobosis, amentis minoribus.* Taxus baccata, *Hooker*, in part Flor. Bor. Am., vol. ii. p. 167.

This species of Yew, so much like that of Europe, occupies a distinguished place in the dense maritime forests of the Oregon,

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* Probably from the Greek, *Toxon*, a bow.

and probably extends to the north as far as Nootka, being hardly like its European prototype, but inclined to grow taller, and more slender. Its usual height is from forty to sixty feet, and we observed no trees of more than about two to three feet in diameter. The wood has the same close and almost invisible grain as that of Europe, of a beautiful white color, slightly inclining to yellow in the branches; with the character of the older wood I am unacquainted, but believe it to be extremely similar to that of the Common Yew, (*Taxus baccata*,) for which our plant might easily be mistaken. The leaves are, however, shorter and thinner, sharply and abruptly terminated with a bristly point, and below attenuated into a short but more distinct petiole. From the European plant it also differs in its leaves, acquiring, when dead and dried, a strong and bright ferruginous tint. The male flowers are much smaller, and more similar to those of the Canadian Yew, (*T. Canadensis*,) with the scales of the perianth imbricated in three pairs instead of five. The stamens are nine to eleven, with the anthers only about half the magnitude of those of the Common Yew. The nut, as usual, is seated in the bottom of a translucent red succulent cup. The leaves are from five to seven-tenths of an inch long.

The Yew of Europe, indigenous to Britain, and as far north as Norway and Sweden, usually affects rocky and mountainous countries. It is very robust, grows slowly, and is attacked by no insect. In the sombre valleys of the Lower Alps, the Yew is seen in all its natural majesty, among steep rocks in forests as ancient as the world, and planted by the hand of nature.

The wood of the Yew is considered one of the most valuable in Europe, and, for beauty, not inferior to the finest and most curious sorts of India. Both the root and trunk furnish, at their ramifications, pieces of wood beautifully veined and marked, which are highly prized for furniture. It has in a high degree all the good qualities which we find so seldom united, such as durability, solidity, elasticity, hardness and fineness of grain,

even when exposed either to the air or water. The sap-wood or outer layer is of a shining white, the inner or perfect wood of a fine red color, and both take a polish as perfect as marble. It is wrought with facility, and is suitable for every thing which requires strength and durability, such as wheels, axle-trees, screws, the teeth of mill-wheels, and for water-pipes. It makes beautiful furniture, vases, &c. Inlaid work, sculpture, and ancient coats of arms of this wood, may be seen in the old churches and halls of Europe, in a state of perfect preservation, and free from worms, after a lapse of more than five hundred years. The sap-wood, though of as pure a white as that of the Holly, is easily dyed of a jet black, when it puts on the appearance of ebony. A single tree is sometimes worth one hundred pounds. The bows most esteemed among the ancients were made of this wood, whose perpetual elasticity rendered it unrivalled for this important use. The aborigines of Oregon are also now in the habit of selecting the Yew of their forests for the same purpose. It is the heaviest of any wood in Europe, a cubic foot weighing sixty-one pounds seven ounces French weight.

The Yews for their use, no less than their sombre grandeur and funeral aspect, were planted in all the old churchyards. According to the ancient poets, the Styx and Acheron were overshadowed by their enduring and lugubrious verdure. The conic form of its summit, and the density of its foliage, always green and insensible to the changes of seasons and of years, gave it a character of solemnity and repose, characteristic of tombs and mortality.

It was formerly much cultivated about gardens, houses, and pleasure-grounds, and clipped into various fantastic shapes of beasts, birds, &c.; but this taste for the grotesque is justly exploded, and the Yew is now seldom seen in cultivation either for use or ornament. This usage still, it appears, exists in Flanders and Holland; and we see very large Yews represent-

ing colossal figures of animals, globes, towers, chandeliers, armed warriors, hunters with their guns, men smoking their pipes! &c.

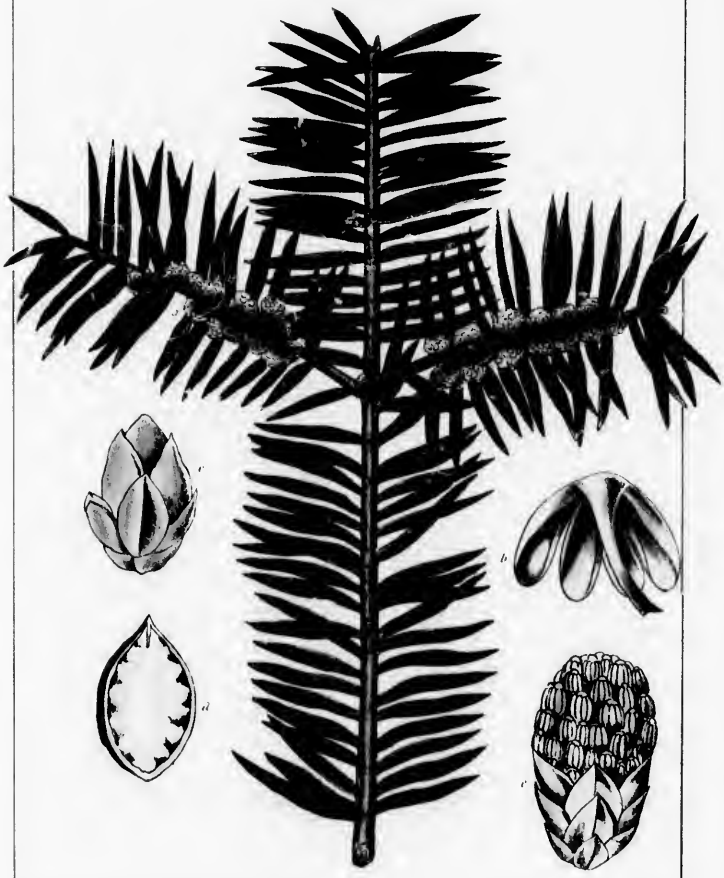
The antiquity of the Yew is as surprising as any other of its properties. Mirbel counted in a slice of Yew, twenty inches in diameter, two hundred and eighty annual layers; and Mr. Pennant mentions a Yew in Fortingal churchyard, in the Highlands of Scotland, whose ruins measured fifty-six and a half feet in circumference, and which was in all probability a flourishing tree at the commencement of the Christian era. The ordinary height of the Yew is, however, seldom more than twenty-five to forty feet.

In twenty years it will attain the height of fifteen feet, and it will continue growing for one hundred years, after which it becomes comparatively stationary, but will live for many centuries. According to London, the largest tree of this kind in England is in Harlington churchyard, near Hounslow, which is fifty-eight feet high, with a trunk of nine feet and a head of fifty feet in diameter. The oldest are at Fountain's Abbey, where they are supposed to have been large trees at the time the abbey was founded, in 1132. The trunk of one of them is twenty-six feet six inches in circumference at three feet from the ground. The Ankerwyke Yew, near Staines, is supposed to be upward of one thousand years old.

The leaves are poisonous to horned cattle and horses, though the berries are inoffensive. Cattle so affected run about in fury and delirium, and at length drop down dead. Three children, according to Dr. Percival, of Manchester, were poisoned dead in a few hours by taking a small dose of the green leaves, as a remedy for worms; but they appeared to have suffered no pain, and, after death, looked as though they were in a placid sleep. The best antidotes to this poison are oily substances.

PLATE CVIII.

*A branch of the natural size. a. A twig bearing a berry.*




Torreya Taxifolia

*Yew Leaved Torreya* *Torreya à Feuilles d'If*

# TORREYA.*

(ARNOTT.)

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*Natural Order*, TAXINEÆ, (Richard.) *Linnæan Classification*, DIŒCIA, MONADELPHIA.

DIŒCIOUS.—*Male* aments subglobose, at length elongated. Scales staminiferous, pedicellate, subpeltate, one-sided, each bearing a 4-celled pendulous anther. FEMALE ament ovate, 1-flowered, the base with imbricated bractes in the same manner as in the male. No fleshy hypogynous disk. *Ovulum* erect. *Seed* naked, large and ovate, with the bractes at its base not becoming enlarged, the shell thick, carnosely coriaceous, within fibrous, integument hard and crustaceous. *Albumen* ruminate. *Embryo* subcylindric and short; cotyledons connate.

An evergreen tree resembling the Yew, with spreading distichally-forked branchlets. Leaves distichal, linear, rigid, bilineate, mucronately pungent.

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## YEW-LEAVED TORREYA.

TORREYA TAXIFOLIA. *Arnott*, in *Hook.*, Icon. Plant. Ined., vol. iii. part 5, t. 132, 133. (Exclude the Synonym of *Taxus montana*, NUTT.)

THIS stately evergreen, resembling the Yew, was discovered in Middle Florida, by the late lamented H. B. Croom, of Talla-

* Named in honor of the well-known botanist, Professor Torrey, of New York.

hassee, and is sufficiently abundant around Aspalaga to be used as timber and sawed into planks. According to Professor Torrey and Mr. Croom, it is a tree of from six to eighteen inches in diameter, and from twenty to forty feet high, with numerous spreading branches, the branchlets dividing into trees: its appearance at a distance is not unlike to that of the Hemlock Spruce, (*Abies Canadensis.*) The wood in the section given me by Dr. Torrey is rather light, not very close-grained, and of a yellowish-white color, almost like that of some of the Pines; it is, probably, however, only the sap-wood, for in old trees it is said to be of a reddish color, like that of the Red Cedar, (*Juniperus Virginiana.*) It has a strong and peculiar odor, especially when bruised or burnt, and hence it is frequently called, in the country where it grows, "Stinking Cedar;" it makes excellent rails for fence, and is not liable to the attack of insects. A blood-red turpentine, of a pasty consistence, flows sparingly from the bark, which is soluble in alcohol, forming a deep, clear solution, and when heated evolves a very powerful terebinthinous but unpleasant odor.

The foliage is much like that of the Yew, but the leaves are broader and marked with two longitudinal lines. The ripe fruit, or rather seed, is as large as a nutmeg; it has no fleshy cup, as in the Yew, but the external coat of the seed itself is carnose or rather leathery, and covers the whole, leaving a minute perforation at the summit. The seed, when deprived of its succulent external covering, bears a strong resemblance to the gland of a large oak. The round male aments resemble those of the Yew, but are much larger, and furnished with imbricated scales or bractes at the base.

According to Mr. Croom, it is found on the calcareous hills along the east bank of the Appalachee River, near the confluence of the Flint and Chattahoochee, and on Flat Creek of the same stream, as well as copiously on the borders of the Aspalaga. Besides these localities of this fine tree, Professor Torrey writes

to me that it has lately been found south of the Suanna. He also adds, "I have another Taxoid yet undescribed, given me by Croom. It is an erect tree, often thirty feet high, with foliage and male flowers resembling the European Yew." To this plant I doubtfully attached the name of *Taxus montana;* and a recent specimen from Mr. Croom, accompanied by a paper of the fruit, now in the herbarium of the Academy of Natural Science of Philadelphia, is marked *Taxus? Floridana.* This species, from what I have seen, is scarcely distinct from our *T. brevifolia*, yet it occupies a very different geographical range.

## PLATE CIX.

TORREYA TAXIFOLIA. *A branch of the male plant, natural size. a. Male amentum. b. Back-view of one of the stamens magnified. c. Female ament and ovule, magnified. d. Section of the ripe seed. e. Germinating seed.*

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TAXUS NUCIFERA of Thunberg and Kæmpfer is, according to Mr. Grey, also a species of *Torreya*, as is likewise, according to Zuccarini, the *T. nucifera* of Wallich from Nepaul. The former is a native of the northern provinces of Japan. Kæmpfer describes it as a lofty tree, with many opposite scaly branches, producing a light wood: the nut is said to be coated and above an inch long; the oil of the kernel is in use for culinary purposes, but is too astringent to be generally esteemed.

# JUNIPER.

(Le Genevrier, Fr.)

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*Natural Order*, Cupressinæ, (Richard.) *Linnæan Classification*, Diœcia, Monadelphia.

JUNIPERUS.* (Linn.)

Flowers mostly diœcious.—Male ament globose, small. *Stamens* many, naked, inserted around a common axis; filaments eccentrically peltate, imbricate, cells of the anthers three to six. Female aments axillary, ovate, the base surrounded with imbricate bractes. Scales of the involucrum three to six, united at the base, with one to three ovules. *Fruit* drupaceous, scaly at base, the involucrum becoming a berry, umbilicate at the apex, and with bony seeds. *Seeds* one to three, erect, subtriquetrous. *Embryo* inverted, situated in the axis of a fleshy albumen. *Cotyledons* two, oblong; radicle cylindric, superior.

Large or small trees inhabiting the mountainous regions of the ancient continent, more rare in North America; the branches erect or pendulous, leaves imbricated, mostly minute, rigid, and semper-virent, resembling scales, of a linear-lanceolate form; the buds naked.

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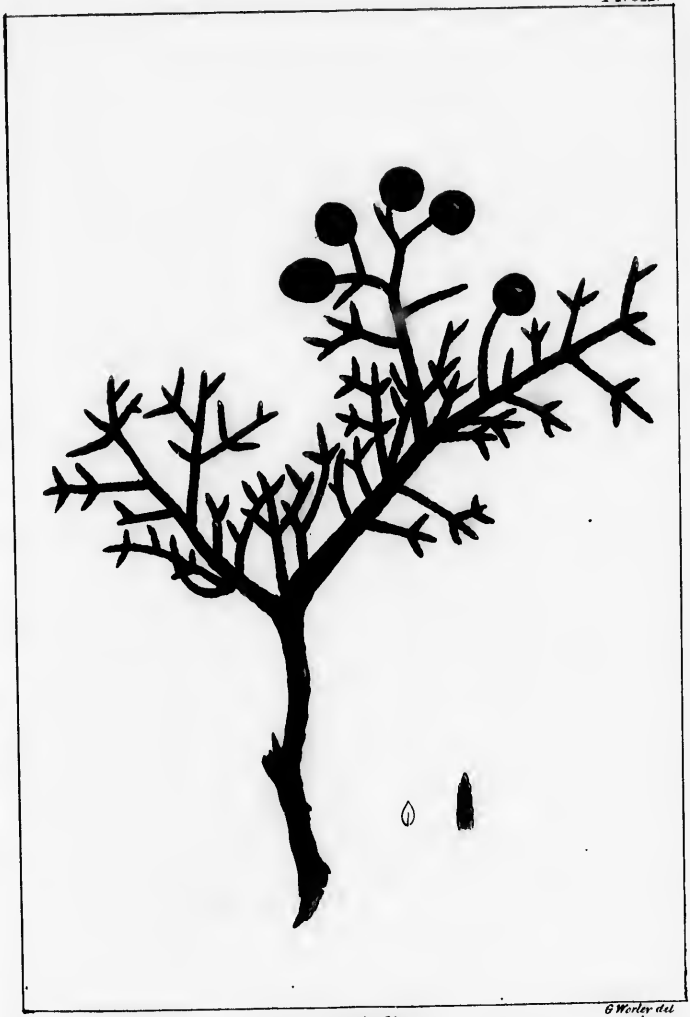
* From the Celtic *jeneprus*, rough or rude.



G. Worley del.

Juniperus Andina.

Rocky Mountain Juniper

Genévrier des Andes

# ROCKY MOUNTAIN JUNIPER.

JUNIPERUS ANDINA. *Ramis patentibus, foliis quadrifariam imbricatis ovatis obtusiusculis convexis apice subcarinatis, cylindulosis, baccis magnis, caule arboreo.*

JUNIPERUS *Occidentalis?*—HOOKER, Flor. Bor. Am., vol. ii. p. 166.

ON passing a gorge of the Rocky Mountains or Northern Andes, and approaching Lewis's River of the Oregon, we first observed this curious and elegant tree, accompanying groves of the American Cembra Pine, spreading for miles along the declivity of the mountain, and in an opposite direction ascending well toward the summit of a mountain which still presented patches of snow in the month of July, under the latitude of about 42 degrees. It attains nearly the height of our Virginian Juniper, or "Red Cedar," growing up about fifteen to twenty feet, but presents a very different aspect, the stem ending in a roundish and not a conic top. The foliage is also of a glaucous or bluish green. The leaves are all closely appressed, and imbricated in three or four rows, the older ones on the stem acute, the proper leaves minute, rather blunt, remarkable for their convexity, and without any glands: the branchlets are numerous and complicated. The berries unusually large, larger than those of the Common Juniper, (*J. communis,*) dark brown and glaucous, with distinct vestiges of the scales which compose them.

This plant is, no doubt, the *Juniperus excelsa* of Pursh, but not the plant of Pallas, according to specimens which I have examined from Tauria. He speaks of it as collected by Captain Lewis, on the banks of the waters of the Rocky Mountains, and calls it a lofty, elegant tree; but we never saw it near any stream, but on the dry declivities of mountains, and, as a tree, it is neither tall nor elegant, but sufficiently singular and inte-

resting. The plant mentioned by Pallas was observed in the Crimea. It grew erect like a Cypress, with the trunk often a foot in diameter. Comparing it with the Savin, (*J. sabina.*) he says, the leaves are more slender and distinct, acute, and rather prominently imbricate, like the leaves of the Tamarisk. The opposite applies to our plant; the leaves are thicker, shorter, and more closely imbricated, so as not to be visible in profile.

Our plant appears to be nearly allied, if not identical, with the *J. Occidentalis* of Hooker, but the leaves are certainly without any appearance of glands, and the branchlets are angular. Douglas's plant was found on the higher parts of the Columbia, and at the base of the Rocky Mountains, where it attained a height of sixty to eighty feet and a diameter of from two to three feet, dimensions also greatly at variance with the present species.

## PLATE CX.

*A branch of the natural size, with fruit.*

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Barbadoes Cedar. (*Juniperus Barbadensis.*) With the leaves imbricated in four rows, the younger ones ovate, and the older acute. This species of Willdenow, said by Michaux and Pursh to inhabit the coast of Florida and the Bahama Islands, appears to be merely a variety of *J. Virginiana,* our common species. If any thing, the leaves are somewhat more closely imbricated, and, apparently, none of them spreading. The same variety is probably more or less spread over the whole of the United States, as I have collected specimens in Massachusetts, which cannot be distinguished from others from the West Indies. Like our ordinary species, it also becomes a tree of twenty or more feet in height.

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Savin, (*Juniperus sabina.*) This species, apparently the same with that of Europe, is indigenous from Canada to Maine. It is

not uncommon in the vicinity of Portland, retaining its usual dwarf habit. Pursh's variety, *procumbens*, I have seen along the shores of Lake Huron. It is a very distinct species, being wholly prostrate, and spreading along the ground in very wide circles. According to Pallas, there is also a procumbent species on the borders of the Tanais with the branches extending on the sand for several fathoms.

---

Red Cedar, (*Juniperus Virginiana.*) West of the Mississippi this tree appears on the high abrupt banks of the Platte, particularly at Scott's Bluffs. The "Black Hills," or most eastern chain of the Rocky Mountains, are so called probably from the dark Red Cedars and Pines with which they are thickly scattered. The borders of Bear River, of Lake Timpanogos, and, in short, the whole range of the Rocky Mountains, clear over to the borders of the Brulée, a stream of the Oregon, are all more or less clad and decorated with our familiar Juniper. It is also said to become one of the highest timber trees in the island of Jamaica, affording very large boards of a reddish-brown color, of a close grain, odoriferous and offensive to insects, and is therefore of great use to the cabinet-maker.

In Sussex county, New Jersey, near Franklin Furnace, I have seen trees of the Red Cedar fifty to sixty feet high, and with a diameter of two feet. There are now in Germantown, Pa., on the estate formerly of Mr. Shoemaker, one or two trees remaining that are one hundred and forty years old, and seventy-five to eighty feet high by two feet in diameter or upward.

With Mr. Crout, a cabinet-maker here, I have seen a small table made from the heart of Red Cedar, which receives an exquisite polish, presents much variety of figure, and is of the most beautiful crimson that can be imagined.

# EVERGREEN TAXODIUM.

*Natural Order*, Cupressinæ, (Richard.) *Linnæan Classification*, Monœcia, Monadelphia.

Taxodium sempervirens. *Foliis perennantibus distichis linearibus acutis coriaceis glabris opacis.*—Lambert's Pines, (ed. 2.) tab. 64. Loudon, Arboret., vol. iv. p. 2487, figs. 2340 and 2341. Hooker and Arnott, Bot. Beech., Suppl., p. 392.

Condylocarpus.—Salisbury.

This remarkable species, which is said to be evergreen, was discovered by Mr. Menzies on the northwest coast of America in 1796, and immense trees of it were found by Dr. Coulter in 1836.

The leaves are linear, acute, and distichous, coriaceous and smooth, opaque, and shining on both sides, keeled beneath, flat on the margin, half an inch to an inch long, half a line broad, and decurrent on the branch. The galbulus (or fruit) is terminal, solitary, roundish, with short imbricated scales at the base, the scales trapezoidal, peltate, thick, and woody; rough above, and radiately striated, depressed in the centre, terminating below in a thick angular pedicel. Seeds many to a single scale, angular and yellowish. Probably a different genus from *Taxodium*, as conjectured by Salisbury.

It is thus alluded to by Douglas in the "Companion to the Botanical Magazine," vol. ii. p. 150:—"But the great beauty of the Californian vegetation is a species of *Taxodium*, which gives the mountains a most peculiar, I was almost going to say awful, appearance—something which plainly tells that we are not in Europe. I have repeatedly measured specimens of this tree [illegible]

hundred and seventy feet long, and thirty-two feet round at three feet above the ground. Some few I saw upward of three hundred feet high, but none in which the thickness was greater than those I have instanced.

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Bald Cypress, (*Taxodium distichum, Cupressus disticha.* Willd.) Dr. G. Engelmann informs me that the most northern station in the West for this tree is at the mouth of the Ohio, and between Mount Carmel and Vincennes on the Wabash.

# ARBOR-VITÆ.

(L'Arbre de Vie, Fr.)

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*Natural Order*, Cupressinæ, (Richard.) *Linnæan Classification*, Monœcia, Monadelphia.

THUJA.* (Tournefort.)

Monœcious.—Male ament terminal, small, and ovoid. *Stamens* many, naked, inserted on a common axis, filaments eccentrically peltate, loosely imbricated; *anthers* 4-celled, opening lengthways. Female ament terminal, small; the *scales* spreading, imbricated in four ranks. *Ovules* a pair at the base of each scale, erect. The *strobile* formed of imbricated woody scales, each having a reflected mucronate subterminal point. *Seeds* under each scale two, with a long or membranaceous testa, on each side winged. The embryo inserted in the axis of a fleshy albumen of its own length: cotyledons two, oblong; radicle superior.

Sempervirent trees of Asia and North America, with compressed branchlets, clothed with minute compressed and imbricated ovate leaves, with the buds naked.

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## GIGANTIC ARBOR-VITÆ.

Thuja gigantea, Nuttall, Plants of Rocky Mountains, p. 52.†) *Ramis ramulisque compressis erectis, foliis ovatis acutis arcte quadrifariam imbricatis intermediis convexis puncto impresso notatis, strobilis arcte reflexis.*—Hooker, Flor. Bor. Am., vol. ii. p. 165.

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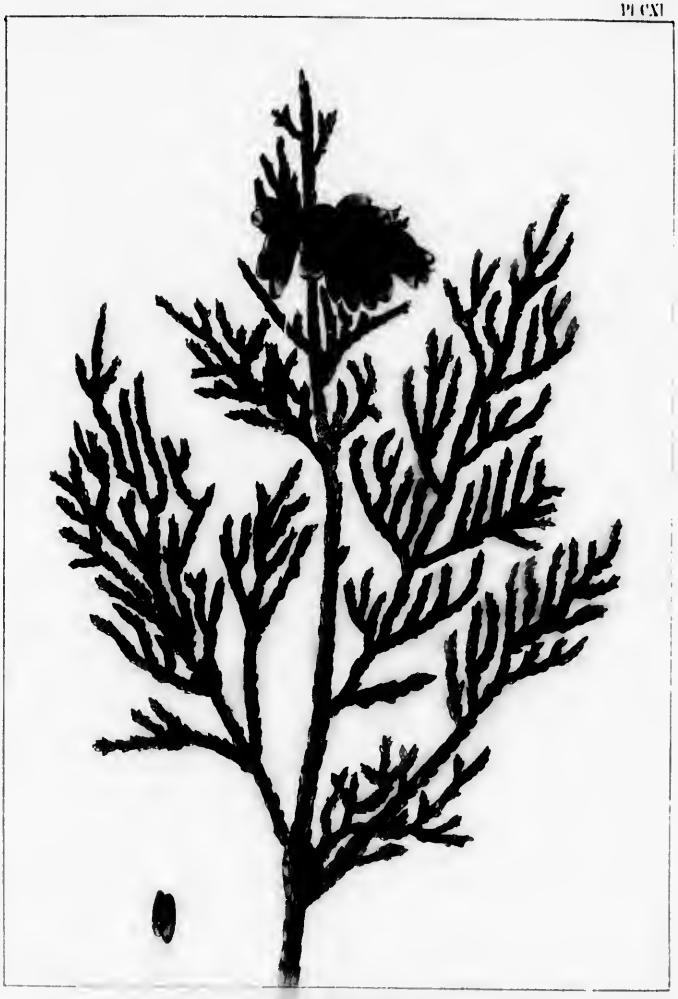
* Derived from θυω, sacrifice, in reference to its use in the East.

† Journal of the Academy of Natural Sciences, Philadelphia, vol. vii. 162



Thuja Gigantea

*Gigantic Arbor Vitae* *Thuja gigantesque*

THUJA *Menziesii*.—DOUGLAS MSS.
THUJA *plicata*.—LAMBERT, Pin., No. 61, (in part.)

THIS is one of the most majestic trees west of the Rocky Mountains, attaining the height of sixty to one hundred and seventy or even two hundred feet, and being twenty to forty feet in the circumference of the trunk. On the shores of the Pacific, where this species is frequent, it nowhere attains the enormous dimensions attributed to it in the fertile valleys of the Rocky Mountains toward the sources of the Oregon. We seldom saw it along the coast more than seventy to one hundred feet in height, still, however, much larger than the common species, (*T. Occidentalis.*) We observed it also on the banks of the Wahlamet, and, according to Douglas, it is found north as far as Nootka Sound. It appears to have been also collected by Menzies. The largest trees seen by Captain Wyeth were growing on the alluvial borders of the Flat-Head River. Its general aspect is a good deal similar to that of *T. Occidentalis*, but the branches are rounder and more erect, less flattened or ancipital; in their color they vary, for while some are green others are glaucous. The seeds are elliptic, and furnished with a wide alated margin. The leaves are always destitute of the glandular tubercle conspicuous in the common kind, and the cones are more drooping and more clustered. Young trees have the usual pyramidal growth of the genus. Of the qualities of the wood, in the wilderness it inhabits, we can say nothing from experience, but imagine it to be very similar with that of *T. Occidentalis.*

The inner bark of this plant is much used by the natives of Oregon both for food and clothing; for the latter purpose, it is split into narrow strips like a long fringe and tied together in a belt round the waist, to conceal the wearer from absolute nudity. According to McKenzie, the aborigines of the West likewise employ the inner rind of the Hemlock Spruce (*Abies Canadensis*) for food. It is taken off early in the spring and

made into cakes, which they eat with salmon-oil, and consider almost as dainties. The natives of Oregon probably use the salmon-oil they collect, in the same manner, with the inner bark of the Arbor-Vitæ.

PLATE CXI.

*A branch of the natural size. a. The seed.*

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## NEE'S ARBOR-VITÆ.

THUJA PLICATA. *Foliis rhomboideo-ovatis acutis, adpressis, quadrifariam imbricatis, nudis medio tuberculatis, strobulis oblongis nutantibus, seminibus obcordatis.*—LAMBERT'S Pines, l. c., No. 61. DONN., Hort. Cantab., vol. vi. p. 249. LOUDON, Arboret., vol. iv. p. 2458.

THIS tree, of which very little is yet known,* is a native of Mexico, where it was found by Nee, and also of the western shores of North America, at Nootka Sound, where it was collected by Menzies. It is described by Loudon as a very branching, spreading, light-green tree, the branches being crowded and covered with a reddish-brown bark; branchlets dense, often divided, pectinate, compressed. The leaves are rhomboid-ovate, acute, closely adpressed, imbricated in four rows, crowded together between the nodes, glabrous, entire, shining, and tuberculed in the middle. The cones are solitary and scattered, oblong and nutant; the scales elliptic, obtuse, flat, obsoletely furrowed. The seeds compressed, winged all round, obcordate-oblong, and emarginate at the summit. Scarcely distinct from *T. Occidentalis*, of which Loudon imagines it to be a mere variety.

* Since the above was written, this Thuja has been much introduced in American planting.

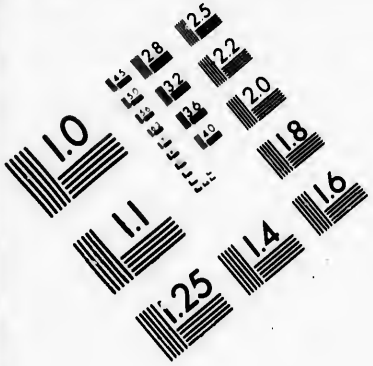
# NOOTKA CYPRESS.

*Natural Order*, CUPRESSINÆ, (Richard.) *Linnæan Classification*, MONŒCIA, MONADELPHIA.

CUPRESSUS NUTKATENSIS. *Ramis suberectis tetragonis, foliis late-ovatis acuminatis quadrifariam imbricatis dorso carinatis etuberculatis, galbulis magnitudine pisi majoris globosis ramos breves terminantibus, squamis umbonatis levibus.*—LAMBERT, Pin., n. 60, sine Ic. HOOKER, Flor. Bor. Am., vol. ii, p. 165.

THUJA *excelsa.*—BONGARD, Veget. de Sitka, p. 46.

THIS species, which I did not meet with, was collected at Nootka, on the northwest coast, by Menzies, at Observatory Inlet, by Dr. Scouler, and as far north as Sitka, by Bongard. The branches are sometimes a little compressed, nearly erect, and tetragonal. The leaves broad-ovate, acuminate, imbricated in four rows, the back carinated but without the glandular tubercle; the fruit about the size of a large pea, terminating short branchlets, and the scales are shield-formed and even. It has a near affinity with the Common White Cedar, (*C. Thyoides*,) but that has shorter, flatter, and more spreading branches, with tubercles on the back of the leaves, and smaller fruit.



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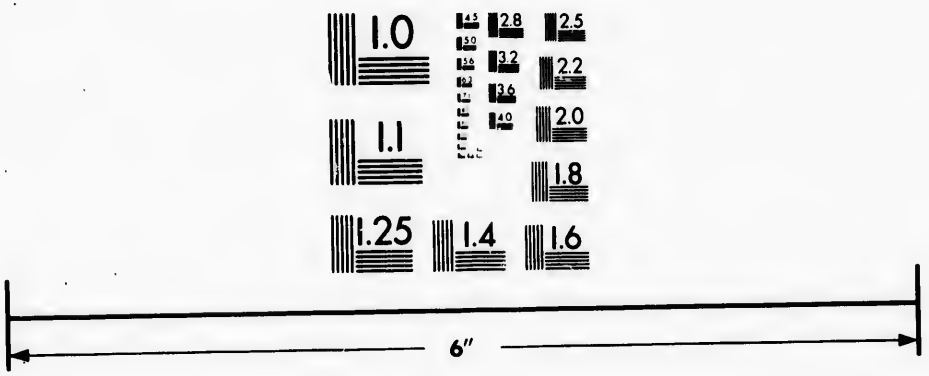


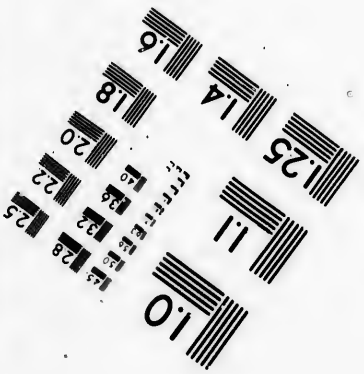


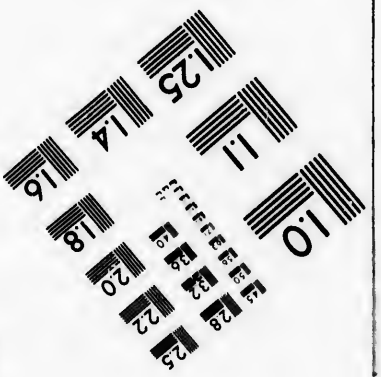


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# PINES.

(Le Pin, Fr.)

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*Natural Order,* Coniferæ, (Jussieu.) *Linnæan Classification,* Monœcia, Monandria.*

PINUS.† (Linn.)

Staminate *flowers* in clustered cylindric aments. *Anther*-scales crested at the apex, each bearing two masses of pollen in cells, and opening lengthways. Fertile *flowers* in ovoid aments, the scales imbricated, 2-flowered, becoming woody, embracing the seed, and forming a cone or strobile. The *nut* usually winged at the summit.

Trees of various dimensions, natives of Europe, Asia, and America, some of them among the largest of known vegetables, bearing leaves which are evergreen, dry, and needle-like or acerose, at first single, but afterward produced from two to five in a common sphaceolous or membranaceous, scaly sheath. The aments or flowers are lateral and terminal, conglomerate; the fertile ones persistent and becoming woody cones.

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* It was referred to the order Monadelphia by Linnæus, but is, in fact, strictly Monandrous.

† A name derived from the Celtic *pin* or *pen,* a rock or mountain, in allusion to the usual place of their growth.

**Pinus Flexilis**

*American sombre Pine* *Pin sombre d'Amerique*

# AMERICAN CEMBRA PINE.

Pinus flexilis. *Foliis quinis lævibus, vagina abbreviata, conis ovatis, squamis crassis umbilicatis subcarinatis inermis elongatis gibbosis, nucibus duris, seminum alis obliteratis, antherarum crista lacera acuminata parvula.*

Pinus *flexilis*.—Torrey and James, in Long's Expedition, Annal Lyceum N. York, vol. ii. p. 249.

Pinus *Lambertiana*, β, Hook., Flor. Bor. Am., vol. ii. p. 162.

This species of Pine was discovered by Dr. Edwin James in Long's Expedition, chiefly in subalpine tracts, and extending from the lowest range of mountains to the region of perpetual frost. In my Western tour, I met with it also in the first range of the Rocky Mountains, called the "Black Hills;" a high, broken country, commencing about thirty-five or forty miles from the usual ford of Laramie's Fork of the river Platte. Scattering trees of this Pine, mixed with clumps of Red Cedars, (*Juniperus Virginiana*,) communicate a sombre aspect to these high hills so much in contrast with the grassy plains around them, and hence the above appellation by which they are generally known. We met with it afterward on the granitic hills of the Sweet-Water, another northern branch of the Platte, from whence it continued to the lofty hills of Bear River, which empties into the Lake Timpanogos.

The American Cembra forms a tree of moderate size, forty to fifty feet high, with a large dense summit, and having a smooth bark like that of the White Pine. It is remarkable for the flexibility of its branches, which are leafy at the extremities. The leaves grow by fives in the same very short sheath, and are rather short and stiff, perfectly even on the margin, triangular and glaucous within. The anthers have a small filiform bifid or trifid crest. The young cone is almost acutely ovate, greenish and smooth, with thick protuberant scales which exude a

clear resin. The older cone is thick and ovate, the scales stout and woody, about twice the length of the seeds, which are as large nearly as peas and without wings, except in an early stage; the scales are terminated by small umbilical elevations, but have no prickles; on the lower portion of the cone they also project considerably. The seeds are agreeable, and are eaten by the natives and the hunters who frequent the mountains.

So nearly is this species allied to the *Pinus Cembra*, or Siberian Stone Pine, that we were for some time doubtful whether it was more than a variety of it. Like that species, it produces wingless seeds which are eatable; the leaves of both are in fives, but in Cembra they are serrulate, in ours even and more rigid. The cones of both are very much alike, but in the present the scales which compose them are twice as long as the seeds, in Cembra they are much shorter, and when young pubescent; the nut in Cembra is also probably larger.

According to Pallas, the Cembra is found on the western side of the Uralian Mountains; and in the northern and alpine parts of Siberia it is of frequent occurrence, sometimes with other species, at other times forming by itself extensive tracts of forest. A dwarf variety exists throughout Kamtschatka. The trunk of the ordinary kind is perfectly erect, nearly free from branches to the summit, and not unfrequently attains the height of one hundred and twenty feet, with a diameter of three feet near the root. The nuts are sent to all parts of Russia as dainties, and are greedily sought by various wild animals. In Siberia the seeds of the Cembra are sometimes produced in immense quantities, at which time they form, according to Gmelin, about the sole winter-food of the peasantry. From the very resinous immature cones is obtained a very fragrant and celebrated oil, known under the name of Carpathian Balsam.

The Cembra grows slowly, the wood is white, somewhat resinous, and of a lax texture, similar to that of fir-wood, but less tenacious. Mr. Lambert, however, remarks that it "has a

**Pinus Sabiniana**

*Prickly coned Pine* *Pin de Sabine à grand cones epineux*

finer grain than common deal." It yields abundance of a fragrant, yellowish, hard, pellucid resin.

The variety *P. Cembra Helvetica*, of Switzerland, grows with remarkable slowness, according to Kasthofer. A tree with a trunk of the diameter of nineteen inches, when cut down was found to have three hundred and fifty-three concentric circles, (indicative of so many years' growth.) The wood is very fragrant and retains its odor for centuries, which perfume, though so agreeable to man, is so offensive to bugs and moths as to deter them from infesting rooms where it is used, either as wainscotting or as furniture.

The variety β of *P. Lambertiana*. Hooker remarks, "A Pine in many respects similar to this was found by Mr. Drummond in very elevated situations of the Rocky Mountains, near the *'Height of Land,'* yet there growing fifty and sixty feet high. The leaves are, however, shorter (two or three inches) and more rigid, and the specimens have the closest affinity with those of the European *P. Cembra*. No cones exist in the collection."—Flor. Bor. Am., vol. ii. p. 162.

PLATE CXII.

*A branch of the natural size. a. The cone. b. Front view of the scale of the cone. c. Back view of the same. d. A cluster of leaves.*

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## SABINE'S OR PRICKLY-CONED PINE.

PINUS SABINIANA. *Foliis ternis pralongis acutis margine scabris, strobilis maximis recurvis ovatis aggregatis, squamis patentibus latissimis apicibus longe acuminatis incurvis spinescentibus, umbus duris.*

PINUS *Sabiniana*.—DOUGLAS, Lin. Transact., vol. xvi. p. 749. LAMBERT'S Pines, (ed. 2.) t. 80. LOUDON, Arboret., vol. iii. p. 2246.

THIS splendid and useful species was discovered on the western flanks of the Cordilleras of California, by the late Mr. Doug-

las. It was found at a great elevation above the level of the sea, being only one thousand six hundred feet below the range of perpetual snow, in the parallel of 40°; likewise on the less elevated mountains near the sea-coast, where the temperature is higher but more uniform, in the parallel of 37°, inhabiting the summits of the mountains only: it also occurs in some part of the range of the Blue Mountains of Oregon, as the Indians brought bags of the eatable kernels to trade on the Grande Ronde Prairie. Dr. Gairdner also collected it on the Fallatine Hills of the Wahlamet.

The stems of these Pines are of a very regular form, and grow straight and tapering to the height of forty to one hundred and forty feet, and are three to twelve feet in circumference when standing apart, clothed with branches down to the ground. The largest and finest trees are seen in the mountains of California.

The wood is white, soft, coarse-grained, and not very durable. A copious transparent resin exudes from the tree when cut; and the nuts, like those of the Cembra Pine, are in great esteem among the natives as food: we found them nearly as pleasant to the taste as almonds, except that they left behind a slight resinous taste. They are of a roundish-oblong form, and about nine-tenths of an inch long by half an inch broad, being much larger than the seed of the following species.

The leaves grow together in threes, rarely in fours, and are eleven to fourteen inches in length, serrulated on the margin, the sheath of the leaves one and a half inches long. The cone very resinous, ovate, recurved, pressing on the branch for support, growing three to nine in a verticillated cluster, and remaining on the tree for a number of years; nine to eleven inches long and sixteen to eighteen inches round. The scales of the cone are spathulate, two and a quarter inches long, with a strong, sharp, in-curved point, which, near the base of the cone, exceeds the length of the scale. The wing of the seed is

short, stiff, and about one-fourth its length. The seed-leaves are seven to twelve.

It was named by Mr. Douglas in honor of the late Mr. Joseph Sabine, Secretary of the Horticultural Society of London. I had not the satisfaction of seeing this tree during my visit to Oregon. The species in the gardens round London appears to be as hardy as the *Pinus pinaster*.

PLATE CXIII.

*A cone two-thirds of the natural size. a. The leaves. b. A scale.*

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## COULTER'S PINE.

PINUS COULTERI. *Foliis ternis pralongis compressis, vaginis filamentoso laceris, strobilis oblongis solitariis maximis, squamis cuneatis, apicibus elongatis incrassatis lanceolatis mucronatis uncipiti-compressis adunci*s. DON, in Lin. Trans., vol. xvii. p. 440. LAMB., Pin., vol. iii. tab. 83. LOUDON, Arbor. Brit., vol. iv. p. 2250.

THIS magnificent species of Pine was discovered by Dr. Coulter on the mountains of Santa Lucia, near the mission of San Antonio, in the 36th degree of latitude, within sight of the sea, and at an elevation of between three to four thousand feet above its level. It was accompanied by the *Pinus Lambertiana*.

The tree rises to the height of eighty or one hundred feet, with large, permanently spreading branches, and the trunk is three or four feet in diameter. The leaves, of a glaucous hue, are longer and broader than in any other known species of the genus; and the cones, which grow singly, are likewise the largest of all Pines, being often more than a foot long, half a foot in diameter, and weighing about four pounds. Travellers compare

them for magnitude to sugar-loaves, which they resemble in form, suspended as it were from forest trees.

The spinous processes of the scales of the cone are very strong, hooked, and compressed, three or four inches in length, and about the thickness of one's finger; characters which essentially distinguish it from the preceding species. The seed, like that of the preceding, to which it is closely allied, is about the size of an almond, and eatable.

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## SMALLER PRICKLY-CONED PINE.

PINUS MURICATA. *Foliis ternis? strobilis inæquilateri-ovatis aggregatis, squamis cuneatis apice dilatatis umbilico-elevato mucronatis; bascos externæ elongatis ancipiti-compressis recurvato-patentibus.*—DON, in Lin. Trans., vol. xvii. p. 441. LAMBERT, Pin., vol. iii. tab. 84. LOUDON, Arbor., vol. iv. p. 2269, fig. 2180.

THIS belongs to the same group with the preceding; but the cones are not larger than those of *Pinus inops*, and are remarkable for the squarrose spreading of the basilar scales, which present long and sharp points in all directions.

This singular species was discovered in Upper California by Dr. Coulter, at San Luis Obispo, in latitude 35°, and at an elevation of three thousand feet above the level of the sea, distant about ten miles. The tree is straight and rather stunted, not exceeding forty feet in height. The cones grow two or three together, and are about two inches long and three inches broad; the scales are wedge-shaped and very thick, dilated at the apex, obscurely quadrangular, mucronated, and with an elevated umbilicus, those at the base of the cone elongated, compressed on both sides, shining, recurved, and spreading.

# HEAVY-WOODED PINE.

PINUS PONDEROSA. *Foliis ternis pralongis tortuosis, vaginis brevibus, antherarum crista rotundata integra, strobilis ovatis reflexis, squamis compressis subquadrangulatis apice spinulosis recurvatis.*

PINUS *ponderosa*.—DOUGLAS, MSS. LODDIG., Catal., ed. 1836. LOUDON, Arboretum Britannicum, vol. iv. p. 2243, figs. 2132 and 2134.

THIS species was discovered by the late Mr. Douglas, on the banks of the Spokam and Flat-Head Rivers, and near the Kettle Falls of the Columbia, in the Territory of Oregon, where it grows in abundance. The same species, I believe, grows also near Monterey, in Upper California, where it likewise gives support to that curious parasite, the *Arceuthobium Americanum*, which exists on one of Douglas's specimens.

The timber is said to be so heavy as almost to sink in water. The tree has proved quite hardy and of rapid growth both in the climate of London and of Edinburgh. It has a very elegant appearance, even as a young tree, and seems to surpass all others in strength and luxuriance.

The leaves are disposed in parallel spirals, from nine to eleven inches long, three in a sheath, which is from half an inch to one inch in length. The scales of the cone terminate in flattened processes scarcely ribbed in any direction. In the centre of the process is a protuberance, large in proportion to the scale, which terminates in a sharp prickle, pointing outward: the scale is an inch long.

The trees I observed in California, growing in a poor soil, were not more than twelve to twenty feet high.

# OREGON PITCH PINE.

PINUS INSIGNIS. *Foliis ternis elongatis tortuosis, strobilis ovatis acutis deflexis, squamis tuberculatis retusis incrmibus inferioribus conicis reflexis.*

PINUS *insignis*.—DOUG., MSS. LOUDON, Arboretum Brit., vol. iv. p. 2265, figs. 2171, 2172.

PINUS *tuberculata*.—DON, Lin. Trans., vol. xvii. p. 442. LAMB., Pin., vol. iii. t. 85. LOUDON, Arbor., vol. iv. p. 2270, fig. 2181.

THIS species was sent by Douglas to the Horticultural Society's Garden in London in 1833, and is said to be of vigorous growth, and as hardy as any of the Californian Pines.

The leaves are of a deep grass-green, thickly set on the branches, of different lengths, and twisted in every direction. The leaves, in the dried specimen from Douglas, are three to four and a half inches long. Cone three and a half to four inches long. In the young growing plant, near London, five to seven inches.

This is, I apprehend, the *Pinus resinosa* of HOOKER, Flor. Bor. Am., vol. ii. p. 161, as far as the locality of the northwest coast is concerned, for he quotes Douglas as finding it growing with *P. Lambertiana*. It is, however, I imagine, sufficiently distinct from that well-known species. The cone appears to be much larger, and the leaves are in threes.

I cannot perceive any specific distinction between the present and the cone described by Don of his *P. tuberculata*, figured by London. It was collected by Dr. Coulter, with the following, which it resembles in size and habit, on the sea-shore of Monterey. The leaves of this or the following species, which I collected during my very transient visit to that place, are usually in threes, slender, and about four inches long, with the margin and inner ridge finely serrulated and grooved internally on either side the midrib. The cone figured by Loudon is indeed more oblong than in *P. insignis*, but we have no doubt

they vary as much as the figures given, and the leaves appear to be wholly similar. It is also nearly allied, apparently, to *P. patula*, found by Schiede and Deppe in Mexico.

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## SPREADING-CONED PINE.

PINUS RADIATA. *Foliis ternis, strobilis inæquilateri-ovatis squamis radiatorimosis umbilico depresso truncatis; lascos externæ triplo majoribus gibbosis subrecurvis.*—DON, in Lin. Trans., vol. xvii. p. 442. LAMBERT, Pin., vol. iii. t. 86. LOUDON, Arboretum, vol. iv. p. 2270, fig. 2182.

THIS useful species of Pine, as well as the preceding, grows abundantly in the vicinity of Monterey, on the sea-coast, in latitude 36°. Point Pinos, at the entrance of the harbor, is covered with them exclusively. The trees of this species grow singly or together, and attain to the height of about one hundred feet, with an erect trunk clothed with branches nearly to the ground. In its foliage and general appearance, as well as economy, it is allied to the Yellow Pine, (*Pinus variabilis.*) It is also scarcely distinct from *P. patula* and the preceding species.

The cones, as described by Mr. Don, are said to be aggregated, of an ovate form, about half a foot in length, ventricose at the base, with spreading, obtuse scales.

According to Dr. Coulter, it affords an excellent timber, which is very tough, and well adapted for the building of boats, for which purpose it is much used.

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Of the PINUS CALIFORNIANA of Loiseleur Deslongchamps, in the "Nouveau Duhamel," vol. v. p. 243, too little is known to

consider it as a well-defined species. As a tree, it is probably identical with one or other of the preceding species, being observed in the neighborhood of Monterey; and seeds were collected by the gardener Callignon, in the expedition of La Perouse. The cone, producing eatable seeds like the Cembra, is, however, a character wholly at variance with any species growing round Monterey.

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## TWISTED-BRANCHED PINE.

PINUS CONTORTA.—DOUGLAS. LOUDON, Arbor., vol. iv. p. 2292, figs. 2210 and 2211.

THIS plant is considered by HOOKER, vol. ii. p. 161, as a mere variety of *P. inops*, with the leaves less rigid. Growing at Sitka, and along the shores of the Pacific, from the confluence of the Oregon, and around Observatory Inlet, (Dr. Scouler,) β forms a low scrubby Pine along the northwest coast; on Mount Rainier, near the snow, not exceeding ten feet in height; and, according to Hooker, the specimens exactly agree with the same species from the United States.

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## WHITE PINE.

PINUS STROBUS. *Foliis quinis gracilibus, vaginis nullis, strobilis elongatis subcylindraceis cernuis, squamis laxis planiusculis, antherarum crista minuta, setacea, bifida.*

PINUS *Strobus*.—LINN., Sp. pl. PURSH, Flor. Bor. Am., vol. ii. p. 644. HOOKER, Flor. Bor. Am., vol. ii. p. 161. LAMBERT, Pines, tab. 32. MICH., Sylva, tab. 145.

β MONTICOLA. *Foliis brevioribus obtusis vix serrulatis.* PINUS *monticola*. DOUGLAS. "The Mountain, or Short-Leaved Weymouth Pine." LOUDON, Arbor., vol. iv. p. 2291, figs. 2208 and 2209. LAMBERT, Pin., vol. ii. p. 3, tab. 87.

RESPECTING the geographical limits of this species, Hooker adds in his "Flora:"—From Nova Scotia and Canada, to the Saskatchawan of Hudson's Bay, in latitude 55°, and the east side of the Rocky Mountains. (*Drummond.*) On the west side of the same great chain of mountains, (including only the variety *β monticola*,) from the sources of the Oregon to the alpine range of Mount Hood, toward the northwest coast.

The largest trees of this towering Pine, which I have seen, are on the borders of the Androscoggin near Paris, in Maine, where they seem to emulate in elevation the vast Firs of Oregon. In the vicinity of Portsmouth, I am informed by John Elwyn, Esq., a tree was cut down some years ago which measured two hundred feet in height. Naugenheim also remarks, that, from the size of two masts for seventy-four-gun-ships that he saw in the Plymouth dock-yards, which measured in the whole piece one hundred and eight feet each, such a tree must have been two hundred feet long and five feet or more in diameter.

No tree approaches so near to this well-marked species as the Bhotan Pine, (*P. excelsa.*) a native of the mountains of Nepaul in India. That species, honored with the native title of the "King of the Firs," attains to the height of one hundred and twenty feet, and, unlike our White Pine in its physical properties, yields an abundance of liquid resin. According to Mr. Lambert, who has made the Pines and Firs a special study, and illustrated their history by a splendid monograph, *P. excelsa* approaches so near in habit and in the shape of its cones to *P. Strobus*, that, were it

not for the simple, round, membranaceous crest of the anthers, it would be almost impossible to distinguish them specifically; still, the leaves are longer and the cones thicker, and in its native soil it is remarkable for its drooping branches, whence it is frequently called the "Weeping Fir," by travellers in the Himalayas.

The timber of the Weymouth Pine continues to be exported to Britain in immense quantities; but it is considered as very inferior to some of our other species, and to the pine timber of the North of Europe. Mr. Copland, an extensive builder and timber-merchant, (according to McCulloch,) when examined before Parliament as to the comparative value of European and American timber, affirmed that "the American Pine is much inferior in quality, much softer in its nature, not so durable, and very liable to dry-rot; indeed it is not allowed by any professional man under government to be used; nor is it ever employed in the best buildings in London; it is only speculators that are induced to use it, from the price of it being much lower (in consequence of its exemption from duty) than the Baltic timber. If you were to lay two planks of American timber upon each other, in the course of a twelvemonth they would have the dry-rot, almost invariably, to a certain extent." McCulloch adds, that "many passages to the same effect might be produced from the evidence of persons of the greatest experience in shipbuilding." (*McCulloch's* Commer. Dict., article Timber Trade.) There is no doubt a good deal of truth and some prejudice in these statements, particularly as regards the durability of White Pine timber, as any one will acknowledge on inspecting the present condition of the Schuylkill bridge at Philadelphia, which, after thirty-seven years have elapsed since its erection, is apparently as sound as ever.

From S. W. Roberts, Esq., civil engineer, we learn that the superstructure of the large wooden bridges so numerous in Pennsylvania is principally constructed of White Pine. The lattice-

bridges are built of thick White Pine planks, for which use this timber is well adapted, on account of its lightness, freedom from warping, and the ease with which it is worked. The Yellow Pine, being harder, is better for the posts of the bridges, because it undergoes less compression. These bridges are generally roofed and weather-boarded, but not ceiled, so that the frame-timber is protected from the weather but exposed to the air. In such situations good White and Yellow Pine posts and beams of moderate size season without injury from dry-rot, and last so long that Mr. Roberts has no experimental knowledge of their comparative durability; but he supposes that the Yellow Pine will be the most durable, as it contains the most resin.

Mr. Roberts remarks, that the thin weather-boarding of White Pine on the sides of frame houses, although thus exposed, remains sound for a generation, even without paint.

"One of the greatest wooden bridges probably in the world is the aqueduct over the Alleghany River at Pittsburg, through which the State canal passes. It has seven spans of one hundred and sixty feet each, with a water-way sixteen feet wide and four feet deep, having a towing-path on each side. The whole structure is roofed and weather-boarded; it is thirty feet wide, and built of pine brought down the Alleghany River. The entire cost of the aqueduct, including the heavy masonry of the abutments and piers, was about $110,000.

"I have lately erected several very large bridges with wooden superstructures of White Pine, the piers being built of stone; but one of them, put up in a peculiar place, has two piers, the foundations of which are of stone, on which are erected *piers of timber*, framed with half-lap splices and lock-joinings secured by screw-bolts, so that any stick may be replaced. The sills are of White Oak; the posts, standing in cast-iron shoes, are of White Pine, and so are the braces. The wooden portion of each pier is one hundred feet in height, and each span of the bridge one hundred and twenty-seven feet."—S. W. Roberts.

Mr. Roberts remarks, that the Yellow Pine (*P. variabilis*) which grows on the hills bordering the Susquehanna in Columbia county (Pennsylvania) is a fine, sound, cohesive timber; but that the kind called Norway Pine, (*P. resinosa?*—Ait. *P. rubra*,—Mich. t. 134.) from Steuben county, New York, is inferior to the Yellow Pine, as the layers of the wood are more easily separated. He also adds, it is well known that the quality of timber depends very much upon the age of the tree, the soil in which it grows, and, in some cases, the influence of the sea-air. Generally speaking, in Pennsylvania, the timber grown in the river-valleys, and, still more, that grown in the mountains from 1500 to 2400 feet above tide, is inferior to that from the hills at intermediate heights.

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## GIGANTIC PINE.

Pinus Lambertiana. *Foliis quinis rigidis scabriusculis, vaginis brevissimis, strobilis crassis longissimis cylindraceis, squamis laxis dilatatis inferioribus subpatulis.*

Pinus *Lambertiana*.—Douglas, in Lin. Trans., vol. xv. p. 500. Lamb., Pin., (ed. 2,) vol. i. t. 34. Lawson's Manual, p. 361. Lindon, Arboret., vol. iv. p. 2288, figs. 2206 and 2207, (reduced,) and figs. 2204 and 2205, natural size.

This majestic pine, according to Mr. Douglas, its discoverer, covers large districts about one hundred miles from the borders of the Pacific, in latitude 43° north, and continues to the south as far as 40°. He first met with it toward the sources of the Wahlamet, (called also Multnomah.) It grew sparingly upon low hills, and was scattered over an undulating country east of a range of mountains which terminate at Cape Oxford, in a soil of pure sand, apparently incapable of supporting any vegetation, but here it attained its greatest magnitude and perfected abun-

Pinus Lambertiana

*Pin gigantique de Lambert*

dance of seed. The trees did not form dense forests, in the manner of the other pines of the northwest coast, but were seen scattered singly over the plains in the manner of some Californian species.

This stately species attains to a height of 150 to 200 feet, and varies in circumference from twenty to sixty feet. A specimen overturned by the winds was in length two hundred and fifteen feet; its circumference at three feet from the ground was fifty-seven feet nine inches, and at one hundred and thirty-four feet from the ground, seventeen feet five inches. The trunk presents an erect shaft, devoid of branches, of from 100 to 170 feet elevation, covered with a very smooth light-brown bark. The pendulous branches form an open pyramidal head like that of a Fir Tree. The leaves are between four and five inches long and grow together, like the *strobus*, in clusters of five, with similar short, deciduous sheaths; they are rigid, of a bright-green color, but not shining, with the margin slightly scabrous to the touch. The cones hang pendulous from the ends of the branches, and are two years in acquiring their full growth, they are at first erect, and do not droop until the second year; when ripe, they are about eleven inches in circumference at the thickest part, and vary from twelve to sixteen inches in length! The scales are loosely imbricated, dilated, and round above, and perfectly destitute of armature. The seeds are eight lines long and four broad-oval, and, like those of the Stone Pine, the kernels are sweet and pleasant to the taste; the wing is about twice the length of the seed, and the seed-leaves are from twelve to thirteen.

The whole tree produces an abundance of pure amber-colored resin, which, when it exudes from trees which are partly burnt, by some chemical change loses its usual flavor and acquires a sweet taste, in which state it is used by the natives as sugar to flavor their food. The seeds (like those of the Cembra in Siberia) are eaten roasted, or pounded into coarse cakes for winter-food.

Its timber, like that of the White Pine, is white, soft, and light, abounding in turpentine-reservoirs, and has a specific gravity of 0·463. The annual layers are very narrow, presenting fifty-six in the space of four and a half inches on the external side.

It is allied to *P. strobus*, from which, however, it is essentially distinct, but almost equally hardy in cultivation.

PLATE CXIV.

*Cone of half the natural size. a. The leaves.*

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# BANKS'S OR LABRADOR PINE.

PINUS BANKSIANA. *Foliis brevibus geminatis rigidis divaricatis obliquis strobilis recurvis tortis, squamis inermibus.*—LAMB., Pin., (ed. 2,) vol. i. tab. 3. PURSH, Flor. Bor. Am., vol. ii. p. 642. LOUDON, Arboretum, vol. iv. p. 2190.

PINUS *rupestris*, (Gray Pine.)—MICH., Sylva, tab. 136.

PINUS *Hudsonia*.—LAMARCK. Encye., vol. v. p. 339.

PINUS *sylvestris* β *divaricata*.—SOLANDER, in Ait. Kew., vol. iii. p. 366.

NOTWITHSTANDING the dwarf size of this species in many situations, Dr. Richardson* describes it as a handsome tree, with long, spreading, flexible branches, generally furnished with clustered and curved cones, of many years' accumulation. It attains even the height of forty feet and upward in favorable situations; but the diameter of the trunk is greater, in proportion to its height, than in the other Pines of the country; and in its native situations it exudes much less resin than the White Spruce, (*Abies*

* Narrative of a Journey to the Polar Seas in 1819 and 1822.

*alba*.) Dr. Richardson found it exclusively occupying dry sandy soils, and it occurred as far northward as latitude 64°, and was said to attain even higher latitudes, on the sandy banks of Mackenzie's River. Douglas found it on the higher banks of the Oregon, and in the valleys of the Rocky Mountains. We also met with it sparingly in the same great chain of mountains, toward the northern sources of the Platte, and forming considerable trees in the valley of Thornberg's Ravine, in the western chain of the Rocky Mountains.

Dr. Engelmann, of St. Louis, informs me that this Pine, accompanied by *P. strobus*, *P. variabilis*, and *Abies Canadensis*, grows on the islands of Lake Michigan.

In the famous Pinetum at Dropmore, in 1837, according to Loudon, there was a Pine of this species twenty-seven feet high, with the diameter of the trunk eighteen inches. It forms an elegant tree as described by Richardson, with long, spreading, flexible branches. Another tree, at White Knights, has attained the height of thirty feet.

Dr. Richardson remarks, that the Canadian porcupine feeds on its bark; and the wood, from its lightness, and the straightness and tenacity of its fibres, is much prized for canoe timber. Titus Smith adds, that on the shallow soils in the vicinity of Halifax, (Nova Scotia,) when not reduced by fires, it produces timber of a useful size. As an ornamental tree, it is prized in Great Britain; but with us, as yet, the appearance of Pines is too plebeian, from their abundance and predominance throughout the barrens and uncleared lands by which we are still surrounded.

# TABLE MOUNTAIN PINE.

PINUS PUNGENS. *Foliis geminis brevibus acutis, strobilis ovato-conicis, ovalcis squamarum elongatis subulatis incurvis inferioribus reflexis.*—PURSH, Flor. Amer. Sept., vol. ii. p. 643. MICHAUX, tab. 140. LAMB., Pin., (ed. 2,) vol. i. tab. 17. LOUDON, Arboretum, vol. iv. p. 2197, fig. 2079, and figs. 2077 and 2078 (excellent figures of the cone, &c.)

A TREE forty to fifty feet high, with the habit of the Scotch Fir, (*P. sylvestris,*) but with a rounder and more branching summit, by which appearance in its native sites it is readily distinguished. The quantity of this species on the Table Mountain, and on a wide stretch of high mountains for many miles north and south of this locality, is very great, and no apprehensions need be entertained, nor is there the most distant probability, of its ever being extirpated by the puny hand of man. On the vast precipices, slopes, impending rocks and chasms of the Linville, a branch of the Catawba, it darkens the whole horizon and presents an imposing mass of intense and monotonous verdure. It generally occupies the summits of the highest rocky ridges, and sweeps over the most dangerous and inaccessible declivities to the margin of precipices, some of which, overhanging the cove of Linville, are at least one thousand feet perpendicular. To the north, its peculiar verdure enables us to trace it by the eye continuously to the vicinity and summit of the Grandfather Mountain, and it seems, Mr. William Strickland, who introduces this species into England, (according to London,) stated to Mr. Lambert, that he observed large forests of it along the Blue Mountains, on the frontiers of Virginia, so that it is by no means a scarce species, but affects the alpine heights of the highest of the Alleghanies, which can never be cultivated or made use of by man except for wild pasturage.

At Dropmore, in England, in 1837, there was a specimen which had attained the height of thirty-four feet, with a diameter of one foot nine inches, (Loudon.) In the character of its cones it approaches the *P. sabiniana* of Oregon. The quality of its wood is unknown.

John Lenthal, Esq., United States naval constructor, informs me that the Pine timber in most general use in the United States Navy is the fine-grain long-leaf Yellow Pine, (*Pinus palustris,*) from the southern parts of North Carolina, South Carolina, and Georgia, which is fully equal, if not superior, to the Baltic timber. Upon this point also an incorrect idea prevails, founded upon the Yellow Pine that finds its way to the European market from Canada and Virginia, being in general of the coarse-grain kind, or which has been tapped for the turpentine, such not being used by the government, and by the merchant-builders only from motives of economy.

The average weight of a cubic foot of seasoned Yellow Pine is from forty-six to forty-eight pounds. It is very doubtful whether any of the best quality of Southern pine is exported.

In the navy, the beams and decks, together with the plank between the ports, are of Yellow Pine, (*Pinus variabilis*, LAMBERT,) also the lower masts, yards, and topmasts. The Yellow Pine of New Jersey is of an excellent quality, but is not in sufficient quantities to form an article of exportation: it is used in New York and Pennsylvania.

The only Northern pine used is the White Pine, and that for boards and such purposes; in the merchant-ships it is used for decks and single-stick masts.

From the opportunities which I have had of seeing the materials made use of in the European dock-yards, and from the specimens in my possession, I have reason to believe that our materials are in no way inferior to theirs, and our ships certainly last as long.

# SPRUCE FIR.

(Sapin, Fr.)

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*Natural Order*, Coniferæ, (Jussieu.) *Linnæan Classification*, Monœcia, Monandria.

ABIES.* (Tournefort.)

The plants of this genus differ from the Pines, with which they have usually been associated, in having the cones less decidedly grouped, the strobiles cylindrically conic, the scales of the cone not thickened at the summit, the wing of the seed persistent, and the leaves solitary, partly scattered, and more or less disposed in two rows.

These are evergreen trees of Europe, Asia, and America, of tall, erect, and often pyramidal forms, clad with a profusion of acerose foliage. Nearly all the species are hardy in cool and temperate climates, such as those of Britain and North America. The genus is so strictly natural as to render it somewhat difficult to define the species.

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* From *abeo*, to rise, in allusion to their aspiring growth; or from *apios*, a Pear Tree, in reference to the form of their fruit.

Abies Douglasii.

*Douglas' Fire.* *Sapin de Douglas.*

§ I. ABIES *proper.—Scales of the cone deciduous; anthers dehiscing transversely.*

## WHITE SPRUCE FIR.

ABIES ALBA. Dr. Richardson, in his Appendix to Franklin's Tour to the North, mentions this tree as the most northerly that came under his observation; and states that, on the Coppermine River, in latitude 67½°, within twenty miles of the Arctic Sea, it attains the height of twenty feet or more. In its native forests it rarely exceeds fifty feet in height. There is, however, in Down, in Ireland, (according to Loudon,) a tree, sixty years planted, which measures fifty-five feet in height; and another in Galway, at Cool, is fifty-six feet high with a diameter of two and a half feet.

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## DOUGLAS'S SPRUCE FIR.

ABIES DOUGLASII, (Sabine MSS.) *Foliis linearibus obtusis subtus albidis linea media elevata marginibus reflexis, strobilis erectis ovatis, squamis paucis latissimis, bracteolis oborato-lanceolatis exsertis trifidis reflexis, lacinia media subulata lateralibus membranaceis erosis longiori.*

PINUS (ABIES) DOUGLASII.—HOOKER, Flor. Bor. Am., vol. ii. p. 162, tab. 183. LAMB., Pin., vol. iii. t. 90.

PINUS *taxifolia.*—PURSH, Flor. Bor. Am., vol. ii. p. 640. LAMB., Pin., (ed. 2,) vol. ii. tab. 47.

THIS plant, in the dense forests of the northwest coast of America, constitutes one of the largest trees known in either hemisphere. It forms a pyramid of deep verdure, which in all its dimensions may almost vie with the loftiest pyramids of art.

Its vast arms spread out in wide circles often nearly from the ground; at other times they issue from the summit of a tall, colossal shaft. In general the conic outline is regularly preserved, and stage upon stage, the branches, decreasing in length, finish by a pre-eminent tuft at a height which astonishes the beholder. It was one of these trees, in all probability, which Lewis and Clarke found near the shores of the Pacific to measure near upon three hundred feet. The trunk measures from six to fifteen feet in diameter. Of the prostrate stump lying at Fort George, near the mouth of the Oregon, noticed by Douglas, one hundred and fifty feet still remained, without any branches, and it gave a circumference of forty-eight feet at three feet from the ground. Its ordinary height is one hundred and fifty to two hundred feet. The bark of the young trees, like that of the Balm of Gilead Fir, has its receptacles filled with a clear yellow and aromatic resin; the older bark is rugged, deeply furrowed, and from nine to fifteen inches in thickness. The leaves strongly resemble those of the Balm of Gilead or Balsam Fir. The cones are about three inches long, terminal, and single, composed of a very small number of wide, rounded, entire, persistent scales, from between which are seen to issue the remarkable, at length reflected, trifid bractes, of which the central segment is slender and elongated. The leaves, about one inch long, are rather numerous, spread out in two directions and in several rows, dark green above and silvery beneath. The male catkins are short, dense, and roundish. The anthers obcordate, very short, two-celled; the crest very short, obtuse, tubercular.

The timber is heavy and firm, with few knots, about as yellow, nearly, as that of the Yew, and not liable to warp. Planks have been sawn of it at Fort Vancouver, where a saw-mill has been established; but I am not aware of their quality. Its rate of growth in London appears to be nearly about that of the Common European Spruce. A plant at Dropmore, in

Abies Menziesii.

*Menzies Spruce Fir* *Sapin de Menzies.*

England, in ten years had attained nineteen feet, and bore several cones.

This species was originally discovered by Mr. Menzies at Nootka Sound, in 1797, during the voyage of Captain Vancouver, and from a specimen without cones or flowers was published a description by Mr. Lambert, under the name of *Pinus taxifolia*, which forms, however, a distinct variety by the greater length of its leaves. It continues along the northwest coast from the latitude of 43° to 52°, and constitutes the principal part of all the gloomy forests of this region, extending into the valleys of the Rocky Mountains, eastward to the upper waters of the Platte, the Blue Mountains of Oregon; and we found it in Thornberg's high alpine ravine, and on the lofty hills of Bear River of Timpanogos, reduced to an elegant spreading tree of forty or fifty feet elevation.

PLATE CXV.

*A branch of the natural size, with the cone.*

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## MENZIES'S SPRUCE FIR.

Abies Menziesii. *Ramis verrucosis, foliis planis acutis brevibus undique sparsis subtus argenteis, strobilis cylindraceis, squamis scariosis cuneato-ovalibus parvulis margine laceris, bracteolis brevibus integris acuminatis.*
Pinus *Menziesii*.—Lambert, Pines, vol. iii. tab. 89. Loudon, Arbor., vol. iv. p. 2321, t. 2232.

This beautiful and very distinct species of Fir was discovered by Mr. Douglas on the northern limits of California, and we found it to constitute the principal part of the lofty and dark forest which caps the summit of Cape Disappointment at the entrance of the Columbia or Oregon.

The branches have an unusual degree of rigidity, and are quite remarkable, when divested of their foliage, (which is exceedingly deciduous,) for the elevated bases of the leaves with which they are so singularly clad and muricated. The leaves are unusually short, curved, and almost equally spread all round the branch; they have also an abrupt point, and are truncated and articulated to the tubercles of the branch. The cones are very elegant, with loose, leaflike, persistent, thin scales, irregularly torn on the edges; the bracteoles are not externally visible, small, and acuminated. The seeds are also small.

Douglas describes the wood of this species as being of an excellent quality. Plants were raised in the vicinity of London, at the Horticultural Society's garden, in the year 1832. In 1838, a plant in that garden was nearly three feet high, and it is propagated by cuttings.

PLATE CXVI.

*A branch of the natural size, with the cone. a. The scale. b. The seed.*

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§ II. Picea. *Scales of the cone persistent, excurated at the base; testa of the seed woody. Anthers opening longitudinally.*

## HEMLOCK SPRUCE FIR.

Abies Canadensis. To the localities of this common species we may also add the northwest coast of America, where it was collected by Dr. Scouler, and has been observed by Dr. Tolmie as far north along that coast as Milbank Sound and Stikine. It is a tree of common occurrence in the Pine forests around Vancouver and along the high banks of the Wahlamet and the Oregon.

The Hemlock Spruce makes very good boards, shingles, and scantling when seasoned; it is very proper for floors, as it lasts long and never shrinks. Used as weather-boards for houses, after thirty years' exposure I have observed it to be still comparatively sound. According to Marshall, the aborigines made use of the bark to dye their splints for baskets of a red color.

S. W. Roberts, Esq., Civil Engineer, writes to me, "Some years ago I was the Resident Engineer of the Portage Railroad over the Alleghany Mountains. When it was commenced in 1831, we cut a road, one hundred and twenty feet wide, through the forest for about thirty miles. The most numerous trees were *Hemlock Spruce*, and the toil of making the preliminary surveys was much increased by the necessity of constantly climbing over or creeping under the immense trunks of fallen trees of this sort, which were lying about in every direction in that primeval forest. Old Hemlocks rot rapidly, and these were in all stages of decay. Hemlock timber was rejected in the construction of the railroad, and to get rid of the trees they were consumed in immense fires. White Pine, White Oak, and Locust were used in the timber structures of the railway. Locust, from its hardness and great durability, was preferred for the cross-sills of the track, but the sticks were too small for most other uses. White Oak came next in order, and then White Pine; good Yellow Pine we could not get; and Rock Oak is classed with White Oak for railroad-sills, and is probably somewhat more durable.

"Since leaving the mountain I have laid down railroad mud-sills of Hemlock, being sound sticks of small size, and they will last as long as White Pine."

# THE GREAT SILVER FIR.

ABIES GRANDIS. *Foliis pectinatis planis obtusis subtus argenteis, strobilis erectis cylindraceis elongatis, squamis compactis latissimis, bracteolis ovatis acuminatis erosis squama multo brevioribus.*

ABIES *grandis*.—LINDLEY, in Penny Cyel., No. 3.

PINUS *grandis*.—DOUGLAS, MSS. LAMB., Pin., vol. iii. tab. 94.

PICEA *grandis*.—LOUDON, vol. iv. p. 2341, figs. 2245 and 2246.

A TALL, stately tree, akin to *A. balsamea*, and attaining a height of one hundred and seventy to two hundred feet. According to Douglas, a native of Northern California, in low moist valleys, but we found it abundant, and constituting considerable tracts, between Fort Vancouver and the neighboring saw-mill, six or seven miles above the fort, where many logs had been cut down and sawn into planks, which were taken for sale to Oahu, one of the Sandwich Islands. It also grew in the Pine woods of Wappatoo Island, in both which places it was frequently about two hundred and forty feet in height. The wood was found to be soft, white, and coarse-grained, yet very well suited for flooring and other purposes when better timber could not be had. This tree mostly presents a tall naked shaft of one hundred or more feet in height, when it commences to branch with a high, spreading, pyramidal summit; the bark is smooth and brownish, the leaves pectinate and spreading, in about two rows, linear, roundish at the point, and often notched, green above and silvery beneath, somewhat dilated toward the apex, and about an inch long. The cones lateral, single, cylindrical and obtuse, something like those of *A. cedrus*, (the Cedar of Lebanon,) about three and a half inches long and two inches broad, of a brown color; the scales transverse, very broad, deciduous, and quite entire. Bracteoles ovate-acuminate, irregularly notched along the margin, and much shorter than the scales.

Abies Nobilis

The *Pinus amabilis* of Douglas is probably a mere variety of the present. London gives two figures from Douglas's specimens in the Herbarium of the London Horticultural Society, (2247 and 2248.) The cone is, however, said to be twice as large as that of specimens of *A. grandis* sent home by Douglas, namely, six inches long and two and a half broad; the leaves are likewise entire, instead of being notched. In other respects no difference is visible. Young plants are growing in the society's garden at Chiswick.

---

## DECORATED SILVER FIR.

Abies nobilis. *Foliis falcatis brevibus acutis subtus argenteis, strobilis erectis, ovato-cylindraceis elongatis, squamis latissimis, bracteolis dilatato-spathulatis deflexis squamas tegentibus, crosis medio subulato-acuminatis.*

Pinus *nobilis*.—Douglas, MSS. Lamb., Pin., vol. ii. last figure. Hooker, Flor. Bor. Am., vol. ii. p. 162.

Picea *nobilis*.—Loudon, Arboret., vol. iv. p. 2243, figs. 2249 and 2250.

According to Douglas, this singular species is a majestic tree, forming vast forests on the mountains of Northern California, and produces timber of an excellent quality. "I spent three weeks in a forest composed of this tree," he says, "and day by day could not cease to admire it." According to Dr. Gairdner, specimens were brought to Fort Vancouver by the Indians, from the Great Falls of the Columbia. (It is known to them by the name of *Tuck-tuck*.)

The cone, six to seven inches long and eight to nine in circumference, is quite peculiar, having its scales entirely concealed by the large reflected and even imbricated bracteoles, (or inner scales,) torn on the margin and terminated in the centre by stiff projecting awl-shaped points. The true scales are broadly lamellar, stalked beneath, copiously covered with minute down,

in-curved, and quite entire on the margin. The leaves are crowded in two rows, linear, somewhat falcate, usually acute, compressed, trigonal, flat above, and marked with a depressed line, silvery or paler beneath, and scarcely one inch long.

To me this species appears very evidently allied to *A. Douglassi*, particularly in that stage of its growth where the bracteoles are reflected.

Plants of this species are also living in the vicinity of London.

PLATE CXVII.

*A branch with fruit. a. The leaf. b. The bracte.*

---

# LEAFY-CONED SILVER FIR.

ABIES BRACTEATA. *Foliis bifariam patentibus mucronatis planis subtus argenteis, strobilis ovatis erectis squamis reniformibus, bracteolis trilobis, lacinia intermedia longissima foliacea recurvata.*

PINUS *bracteata*.—D. DON, in Lin. Transact., vol. xvii. p. 443. LAMBERT'S Pines, vol. iii. tab. 91. LOUDON, Arboret., vol. iv. p. 2348, fig. 2256.

PINUS *venusta*.—DOUGLAS, in Compan. to Botan. Magaz., vol. ii. p. 152.

THIS curious and interesting species of Fir was, it seems, discovered by Douglas, in March 1832, on the high mountains of the Oregon. Dr. Coulter, from whose specimens it was described by D. Don, found it in latitude 36° on the sea-side mountain-range of Santa Lucia, about one thousand feet lower down than the situation of the *Pinus Coulteri*. According to this gentleman, the nearly naked, slender trunk rises to the height of one hundred and twenty feet, as straight as an arrow, and not exceeding two feet in circumference. The upper third of the tree is clothed

Abies Bracteata

*Leafy cone & Silver Fr.* *Sapin bracté*

with branches, giving it the appearance of an elongated pyramid. The branches are spreading, and the lower ones decumbent. The bractes are long and recurved, and but little changed from the character of ordinary leaves, which gives the cones a very peculiar and singular appearance. It is only the middle branches that produce cones when on the tree, being in great clusters, and, seen at a great elevation, the cones strikingly resemble the Banksia's in their inflorescence.

The leaves are crowded, but in two rows, linear-mucronate, flat, and rigid, two to three inches long, one line broad, light-green and shining above, silvery beneath. Cones on adult branches only, single, lateral, almost sessile, erect, ovate, and turgid, four inches long and two inches in diameter, scaly at the base. Scales of the cone kidney-shaped, roundish, concave, stalked, thick and indurated [illegible] brown, in-curved on the margin, crenulate, and externally [illegible]. The bracteoles wedge-shape, coriaceous and rigid, of the same color as the scales, but shorter, three-lobed at the summit, the lateral lobes short, roundish, and irregularly dentate, the middle segment recurved an inch and a half long, and resembling a true leaf in every respect, but only half their breadth.

This singular tree is scarcely introduced into Europe.

PLATE CXVIII.

*A twig with the cone reduced. a. The leaf. b. The bract.*

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## DOWNY-CONED SILVER FIR.

ABIES LASIOCARPA. *Foliis obtusis pralongis concoloribus, strobilis? squamis latis subrotundatis extus dense fusco-pubescentibus, bracteolis late oboratis vix denticulatis squama subduplo-brevioribus apice mucronato-acuminatis.*

PINUS (ABIES) *lasiocarpa.*—HOOKER, Flor. Bor. Am. vol. ii. p. 163.

This remarkable species, as it regards the character of the scales of the cone, was, it appears, discovered on the northwest coast, (probably in Upper California,) by the late Mr. Douglas, in his last eventful journey. Little is known of it, as there are no entire cones accompanying the solitary specimen of this interesting plant. The scales of the cone are clothed with a dense and almost ferruginous down. The leaves are longer than in any other American species.

---

## FRASER'S BALSAM FIR.

Abies Fraseri. *Foliis emarginatis subtus argenteis, strobilis oblongo-ovatis, bracteolis obcordatis mucronatis exsertis reflexis.*

Pinus *Fraseri.*—Pursh, Flor. Bor. Am., vol. ii. p. 639. Lamb., Pin., (ed. 2,) vol. i. t. 42.

Picea *Fraseri.*—Loudon, Arboretum, vol. iv. p. 2340, figs. 2243 and 2244.

This species, so nearly allied to the Balsam Fir, (*A. balsamea,*) was discovered on the high mountains of Carolina, by Fraser, and on the Broad Mountains in Pennsylvania, by Pursh, who first described it. It is a smaller tree than *A. balsamea,* or rather compact bush, seldom exceeding ten feet in height; the leaves are shorter and more erect, and the cones about one-half the size. It was introduced into England by Mr. Fraser in 1811, and the original tree in the Hammersmith Nursery, in 1837, was fifteen feet high, and had for two or three years produced cones, but no male catkins.

It is omitted by Michaux, who probably considered it, as I did, a mere variety of *A. balsamea.* It is, however, a perfectly-distinct species.

Leaves short, secund, and crowded round the branch, linear,

**Abies Fraseri.**

*Fraser's Balsam Fir.* *Sapin de Fraser*

subfalcate, flat, emarginate, rarely entire, the margin and rib prominent and obtuse, beneath silvery and sometimes bisculate, about half an inch long. Masculine aments terminal, crowded, oblong, subtended at base by numerous obovate, fimbriate, membranaceous, caducous scales. Anthers two-celled, opening longitudinally, with a small subreniform, entire, callous crest. Cones aggregated by two or three together, sessile, oblong, obtuse, cinereous, puberulous, about two inches long; the scales cuneate-rounded, below subcordate and unguiculate, the margin entire and inflected. The dorsal appendage or bracte oblong-obcordate, cartilaginous, subfoliaceous, with a thin erose margin, twice the length of the scales, reflected, with an abrupt subulate short point. Seed black, shining, with an oblong striated wing, with an interior straight margin.

PLATE CXIX.

*A branch of the natural size, with cones. a. The leaf. b. The scale. c. The scale and bracte.*

---

It is remarkable to find that the Pines, by mountain-elevations, extend their geographic range even to the tropics, and we have thus, in the *Pinus Occidentalis*, a Pine indigenous to the island of St. Domingo; it, however, inhabits a range of mountains on which snow occasionally falls, notwithstanding the warm latitude in which it is found.

In the herbarium of the Academy of Natural Sciences of Philadelphia, we have a specimen with staminiferous flowers, also from the island of Cuba, collected by M. La Sagra, which appears to be a variety of *Pinus Montezumæ* of Lambert, discovered by Humboldt and Bonpland, on Orizaba and other mountains of Mexico. As this variety appears distinct, I propose to distinguish it as

Pinus Montezumæ, β Cubensis. *Foliis ternis pralongis acuminatis striatis, margine scabris intus carinatis concoloribus, amentis masculis fuscatis elongatis, antherarum crista rotundata convexa integriuscula maxima.*

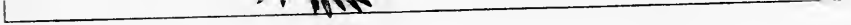
Leaves always in threes, seven to eight inches long, rigid, and serrulated, with a longish rigid acuminate point, the keel shallow and also rough; sheath persistent, rather short, the outer stipular scales torn on the margins. Male aments about two inches long. The scale-like brown summits of the connectivum of the anthers imbricated almost like the scales of a fertile cone; two-thirds of a line wide, rounded, almost reniform, the border equal, somewhat paler, and membranaceous, slightly eroded, (as seen through a glass.) Anthers two-celled.

---

## SINCLAIR'S PINE.

Pinus Sinclairii. *Foliis ternis aciculatibus elongatis gracilibus supra canaliculatis dorso convexis margine asperis, strobilis basi obliquis pedalibus oblongis, squamis cuneatis elongatis, apicibus crassis, clavato-tetragonis centro tuberculo spinuloso uncinato instructis.*—Hook. and Arnott., Bot. Beech., p. 392, t. 93.

This species, according to Dr. Sinclair, covers the hills from Monterey to Carmel, and Point Pinos. It is the supposed *P. rigida* brought from California by Menzies, and forms a stately tree seventy or eighty feet high. The leaves are ternate or occasionally binate, three to four inches long, rigid, sharp but slender. The cone is about a foot long; the scales two to three inches long, three-quarters of an inch broad, cuneate, thickened, and quadrangular at the apex, with a short, reflected, sharp, rigid mucro. It appears to be allied to *P. Montezumæ*.



Pl. CXX.

Larix occidentalis

[illegible] Sagin d. Pordent

# LARCH.

(Le Meleze, Fr.)

---

*Natural Order,* Coniferæ. *Linnæan Classification,* Moncecia, Monandria.

LARIX.* (Tournefort.)

The plants of this genus differ from the Pines and Firs in having deciduous, clustered leaves. Anthers opening longitudinally. Bractes colored and persistent. The cones are erect, with the scales excavated at the base and persistent.

Deciduous-leaved trees with globular, proliferous buds, usually of large dimensions, natives of the mountainous regions of Europe, the West of Asia, and of North America; highly valued for the great durability of their timber.

---

## WESTERN LARCH TREE.

Larix Occidentalis. *Foliis rigidis utrinque bicanaliculatis, strobilis ovatis majusculis, bracteolis sublanceolatis integris longissime foliaceo-acuminatis squarrosis.*

We met with this apparently-distinct species of Larch in the coves of the Rocky Mountains on the western slope toward the Oregon. It resembles the European Larch, but the leaves are

* Supposed to be from the Celtic *lar,* fat, in allusion to the abundance of resin which it affords.

shorter, thicker, and quite rigid, so as to be pungent at the points; and the leaves, having a double channel above and beneath, are, though flat, in part tetragonal; the central rib beneath is very wide and obtuse; they are also shining. The longest leaf is scarcely an inch. The cone, (not perfect,) in a young state, has no vestige of pubescence, and the bractes with their leafy points are half an inch long, ovate-lanceolate, a little torn on the upper edges; the centre is carried out into a true rigid-channelled and pungent green leaf. It appears allied to *L. pendula*, but the leaves are twice as thick. The quality of its wood or any thing concerning its economy we had no opportunity to learn; that of the Small-coned American Larch (*Larix microcarpa*) is so ponderous that it will scarcely swim in water.

The European Larch (*Larix Europæa*) thrives well in the northern parts of the Union, particularly round Boston, and is at once extremely useful and ornamental. In suitable situations the timber arrives at perfection in forty years, or in about half the time as that of the Scotch Pine, and it is found to grow best in poor sandy and rocky soils where scarcely any thing else will survive. When fully grown, it attains the height of from sixty to one hundred and thirty feet. Its durability, exposed either to the action of the air or water, is without any parallel. The wood is also of a beautiful yellowish-white color, sometimes inclining to brown, very hard, capable of receiving a degree of polish equal to any wood yet known, and much superior in this respect to that of the finest mahogany. The log cottages constructed of the squared trunks of Larch, in the valleys and other parts of Switzerland, last for centuries without alteration; it is also used for shingles to cover the roofs of the houses, and for vine-props. For the latter purpose it is found the most durable of all kinds of wood: the vine-props made of it are never taken up; they remain fixed for an indefinite succession of years, and see crop after crop of the vines spring up, bear

their fruit, and perish at their feet, without showing any symptoms of decay. In most cases, the proprietors of the vineyards are perfectly ignorant of the epoch when these props were first placed there; they received them in their present state from their fathers, and in the same state they will transmit them to their sons. Props made of the Silver Fir, and used for the same purpose, would not last more than ten years. The wood of the Larch, according to Hartig, weighs 68 lbs. 13 oz. per cubic foot when green, and 36 lbs. 6 oz. when dry, and it is said to last four times longer than that of any other tree of the Abietinæ.

Venice Turpentine is one of its products, for which the trunk is tapped; and a full-grown Larch will yield annually seven or eight pounds for forty or fifty years in succession.

The bark is also used for tanning, and considered equal to that of the Birch, which is used for that purpose in Russia and Sweden.

The fine grain of the larch-wood, as well as its durability and stability, have long recommended it to painters for their palettes, and for painting panels; and, according to Pliny, it was employed for this purpose by the ancients; and Evelyn remarks, that several of the paintings of Raphael are on larch-wood.

## PLATE CXX.

*Branch of the natural size, with the cone. a. The leaf. b. The bract of the cone.*

# PISONIA.*

(Pisone, Fr.)

---

*Natural Order*, Nyctagineæ, (Jussieu.) *Linnæan Classification*, Polygamia, Dioecia.

Polygamous dioecious.—*Calyx* campanulate, with the deciduous border plaited and 5-cleft. No corolla. *Capsule* of one cell, containing one seed, without valves, clothed by the pentangular, dry, or succulent base of the calyx. *Stamens* six to eight, exserted. *Style* simple; the *stigma* bifid.

Small trees, chiefly of the tropical parts of America and India. The leaves alternate or nearly opposite, entire; the flowers small and herbaceous, in axillary or terminal racemes or cymes.

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## PRICKLY PISONIA, or FINGRIGO.

(Pisone épineuse, Fr.)

Pisonia aculeata. *Spinis axillaribus, patentissimis; foliis ovatis, utrinque acutis, subacuminatis, glabriusculis; calycibus demum aculeatis glutinosis.*

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* Named by Plumier in honor of Piso, who wrote on the Natural History of Brazil.

Pl. CXXI.

Pisonia Aculeata

Pisonia *aculeata*.—Linn., Sp. pl. Jacq., Amer., p. 274. Gertner., De Fruct. cent., vol. v. t. 76, f. 4. Lam., Illust., t. 861. Plumier, Gen., p. 7, t. 11, et Icon. 227, fig. 1.

Pisonia *assurgens, sarmento valido; foliis ovatis, utrinque productis; spinis validis, recurvis; racemis lateralibus*.—Browne, Jam., p. 258.

Rhamnus *seu lycium, fingrigo Jamaicensibus dictum*.—Pluk., Almag., p. 318, t. 108, f. 2.

Paliuro *affinis; arbor spinosa, flore herbaceo, pentapetaloide; fructu sicco, nudo, canaliculato, lappaceo*.—Sloane, Jam., p. 137; Hist., vol. ii. p. 25, t. 167. Rai, Dend., p. 95.

This inelegant but curious trailing-branched tree is indigenous to Jamaica, Cuba, and other of the West India Islands, and Brazil, where it attains the height of twelve to twenty feet, with a diameter of eight to ten inches. It has also been observed at Key West by Dr. Blodgett. The spiny branches droop and trail diffusely, so as to form thickets which are very troublesome to traverse; the spines, short and crooked, seize on the clothing of the traveller, and the glutinous capsules adhere to every thing they happen to touch. The wings of some of the birds, particularly the ground-doves, are sometimes so loaded with the berry-capsules as to render them incapable of flying. With its uses and other properties we are unacquainted. Other species, allied to the present, also inhabit the West Indies, of which the wood is said to be of inferior value.

The bark of the trunk of this tree is even, and of a dark brown. The branches are almost opposite. The leaves simple, petiolated, oval, somewhat rigid, often shortly acuminated and acute at the base, nearly opposite, one and a half inches long, and sometimes nearly as wide; the midrib beneath is often covered partly with short, close hairs. The spines are short, stout, and recurved. The campanulate flowers appear with the expansion of the leaves toward the extremities of the branches, in rounded downy corymbs; they are small, yellow-

ish-green, furnished at the base with two or three small scale-like bractes, and have somewhat the scent of elder-flowers; the border is five-cleft, the segments very spreading, short, oval, and acute. The stamens about six. The fruiting corymb becomes widely divaricate and dichotomous. The fruit is dry, club-shaped, pedunculated, having its five angles beset with rows of very glutinous asperities. The seeds are even, oval, and oblong.

END OF VOL. II. OF NUTTALL.

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IN THE

# NORTH AMERICAN SYLVA

## OF MICHAUX AND NUTTALL:

*Arranged in their Natural Families, according to the System of* Dr. LINDLEY, *as laid down in the "Vegetable Kingdom," London*, 1846

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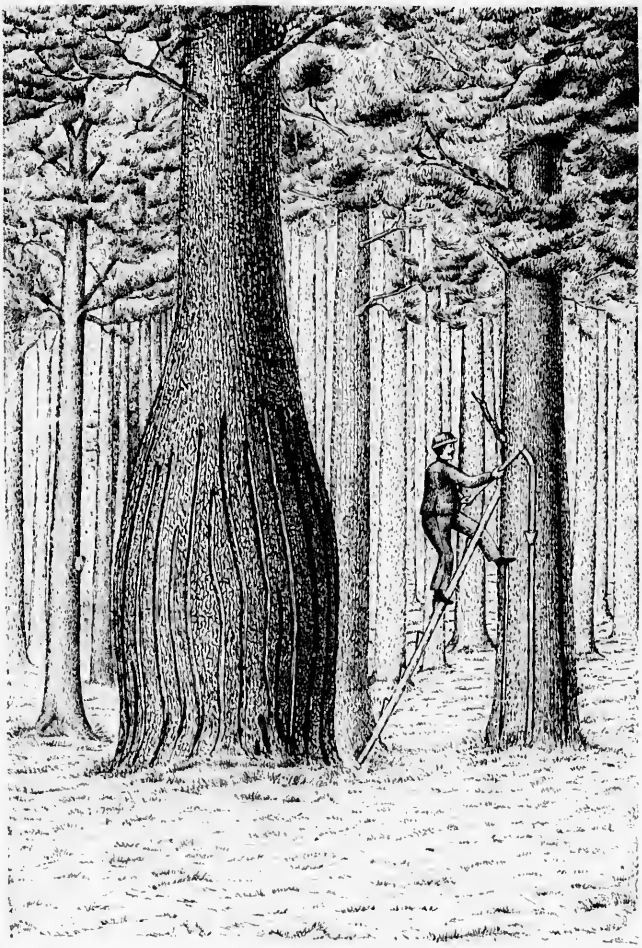

TURPENTINE ORCHARDING IN FRANCE.

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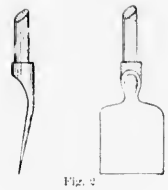

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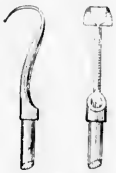

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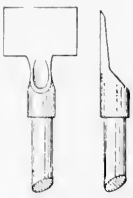

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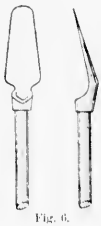
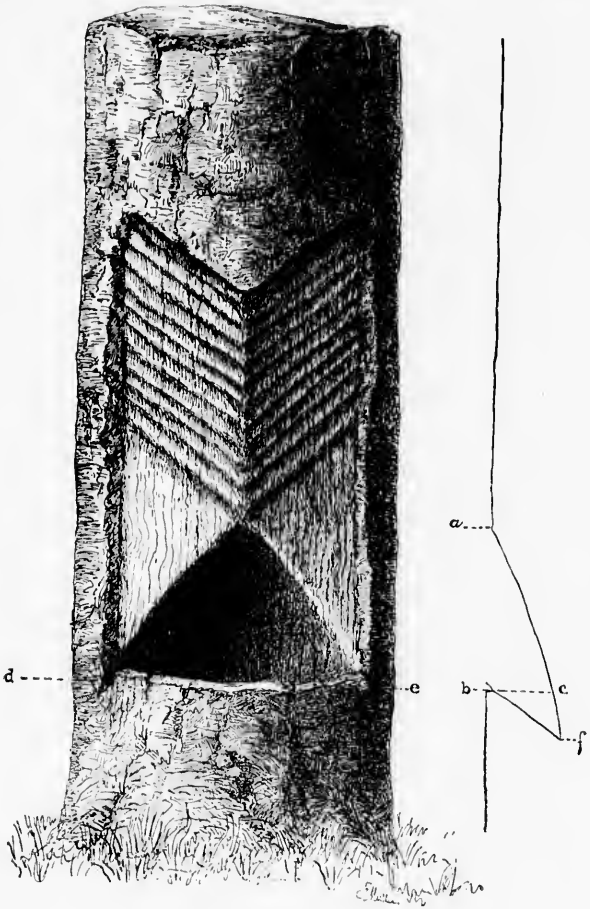


Fig. 6.

Fig. 7.

TOOLS USED IN FRENCH PRACTICE OF TURPENTINE ORCHARDING.




AMERICAN PRACTICE OF BOXING AND CHIPPING.

Fig. 1.

Fig. 2.

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

TOOLS USED IN AMERICAN PRACTICE OF TURPENTINE ORCHARDING.