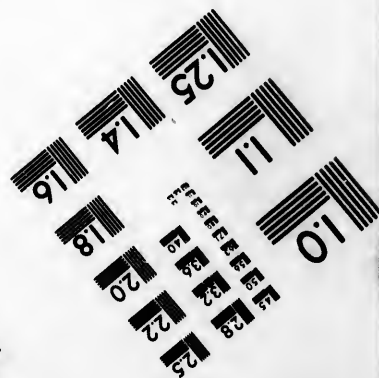
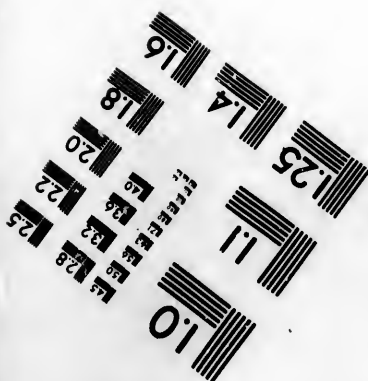
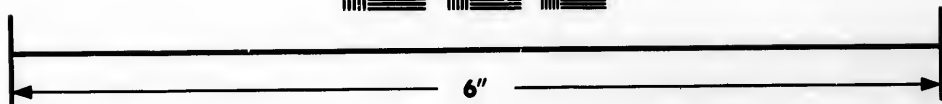
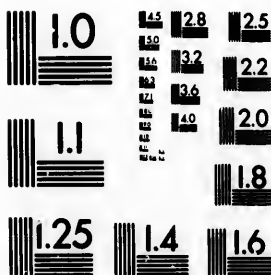


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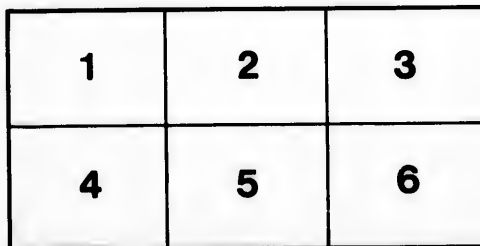
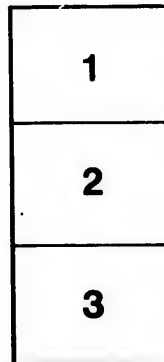
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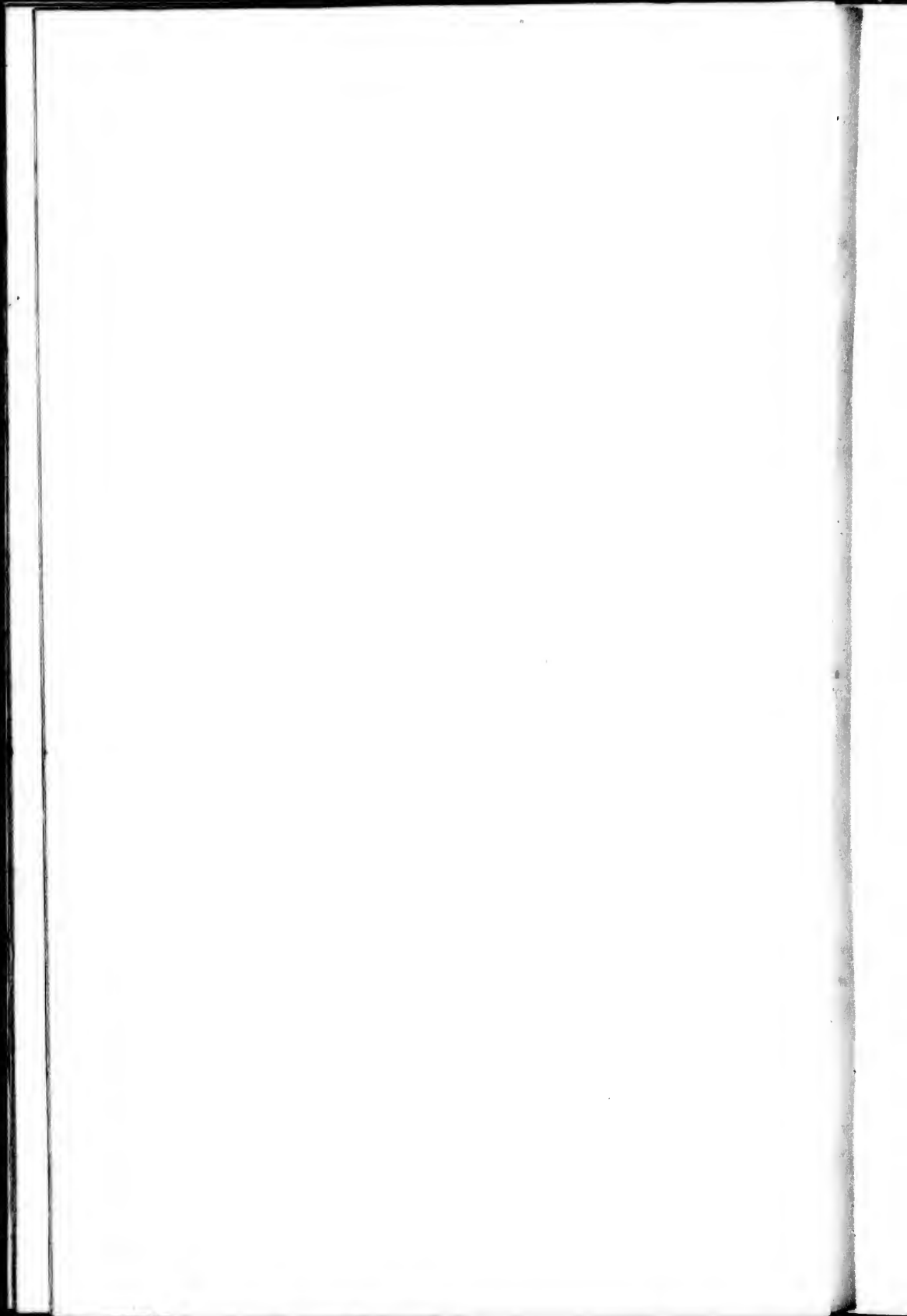
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THE
NORTH AMERICAN
SYLVA;
OR,
A DESCRIPTION OF THE FOREST TREES
OF THE
UNITED STATES, CANADA AND NOVA SCOTIA,
NOT DESCRIBED IN THE WORK
OF
F. ANDREW MICHAUX,
AND CONTAINING ALL THE
FOREST TREES DISCOVERED IN THE ROCKY MOUNTAINS, THE TERRI-
TORY OF 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 122 FINE PLATES.

BY THOMAS NUTTALL, F. L. S.,

Member of the American Philosophical Society, and of the Academy of Natural
Sciences of Philadelphia, &c. &c. &c.

IN THREE VOLUMES.—VOL. III

BEING THE SIXTH VOLUME OF MICHAUX AND NUTTALL'S NORTH AMERICAN SYLVA.

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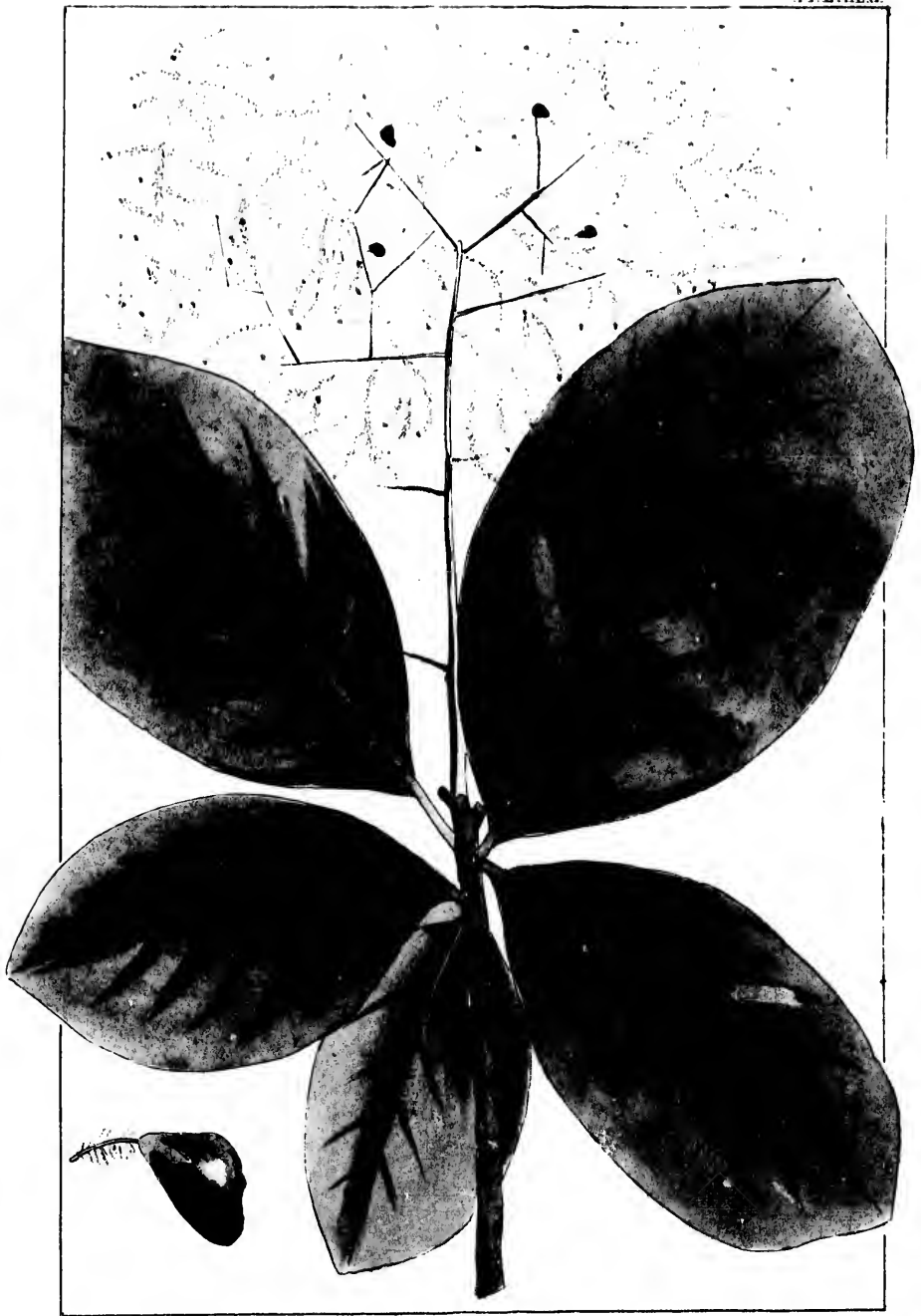
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1849.

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Cotinus Americanus.

Large Leafed Cotinus

Sumach Tree of America



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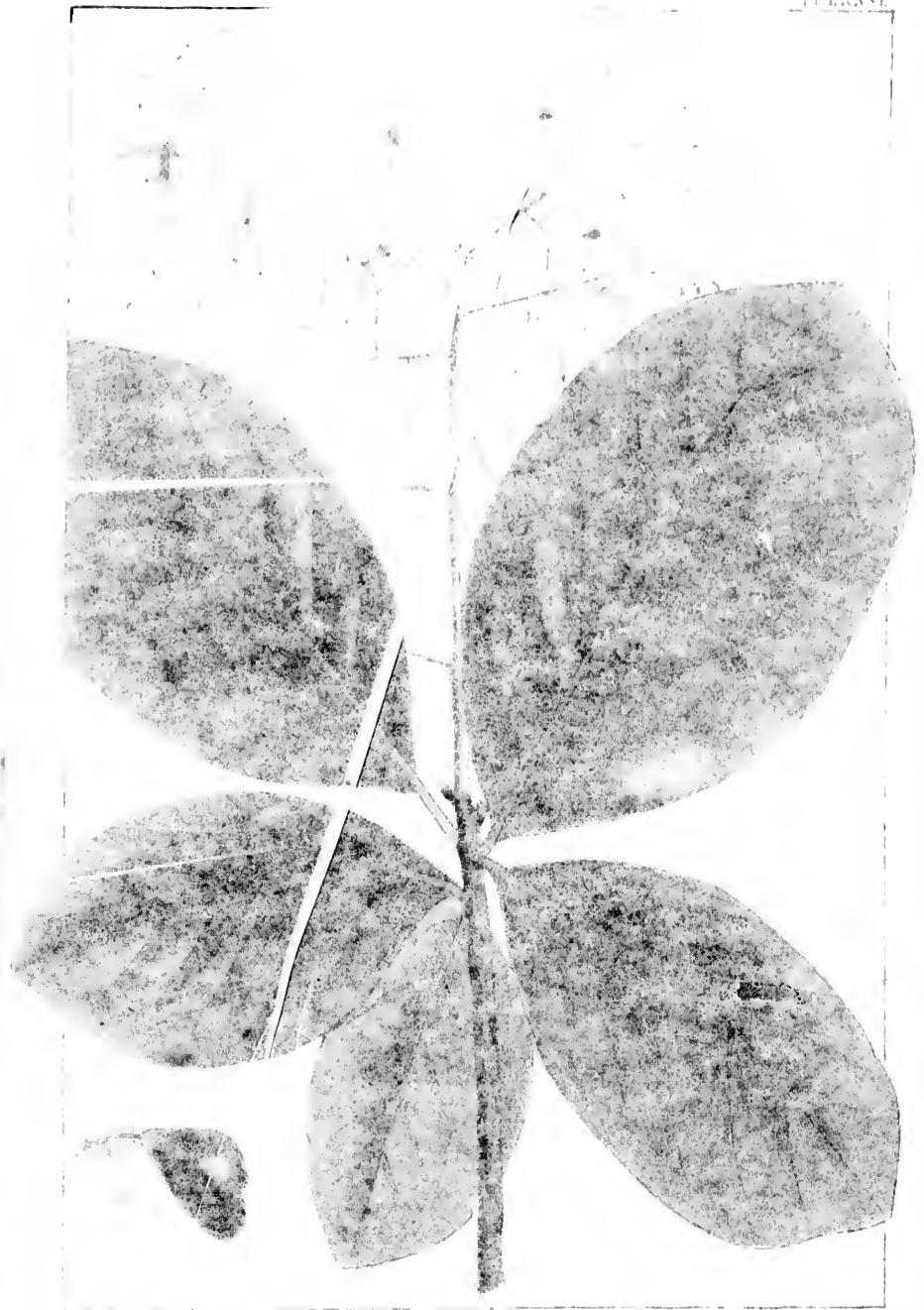
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Cypripium Americanum

Journal de Botanique

Paris, 1845

COTINUS, OR VENITIAN 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 rhomboideo-ovatis subtus ad nervos pubescentibus, panicula parva laxa.*

RHUS *Cotinoïdes*, NUTT. MSS. in Herb. Acad. Philad.

RHUS *Cotinus?* TORREY and GRAY, Flora N. Amer. 1, 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

VOL. III.—1

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 3 to 4 inches long, by 2 to 2½ 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, 2-celled, 1-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.

Another very distinct species of this genus also exists in Nepal. 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 sub-ovate, pubescent, beneath softly villous, the calyx and young peduncles are also hairy.

The *Cotinus* of Europe, or Venitian Sumac, forms a tufted small tree from 6 to 15 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, ebenists, and 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 Sumac, 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.)

Natural Order, ANACARDIACEÆ. Linnæan Classification, PENTANDRIA TRIGYNIA.

Sepals (or calyx leaves) 7 to 9, coloured, concave, with scarious margins, imbricated in several series, persistent, passing into the bracteoles. *Petals* 5, oblong, subunguiculate, similar with the sepals, pubescent at base, inserted under the margin of the disk. *Stamens* 5 to 7. *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, subaritime evergreen trees of Upper California. Leaves simple, alternate, thick and coriaceous. Flowers polygamous, sessile, in terminal contracted panicles.

ENTIRE LEAVED STYPHONIA.

STYPHONIA INTEGRIFOLIA, *foliis ovalibus 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. Amer.* 1, p. 220.

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

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



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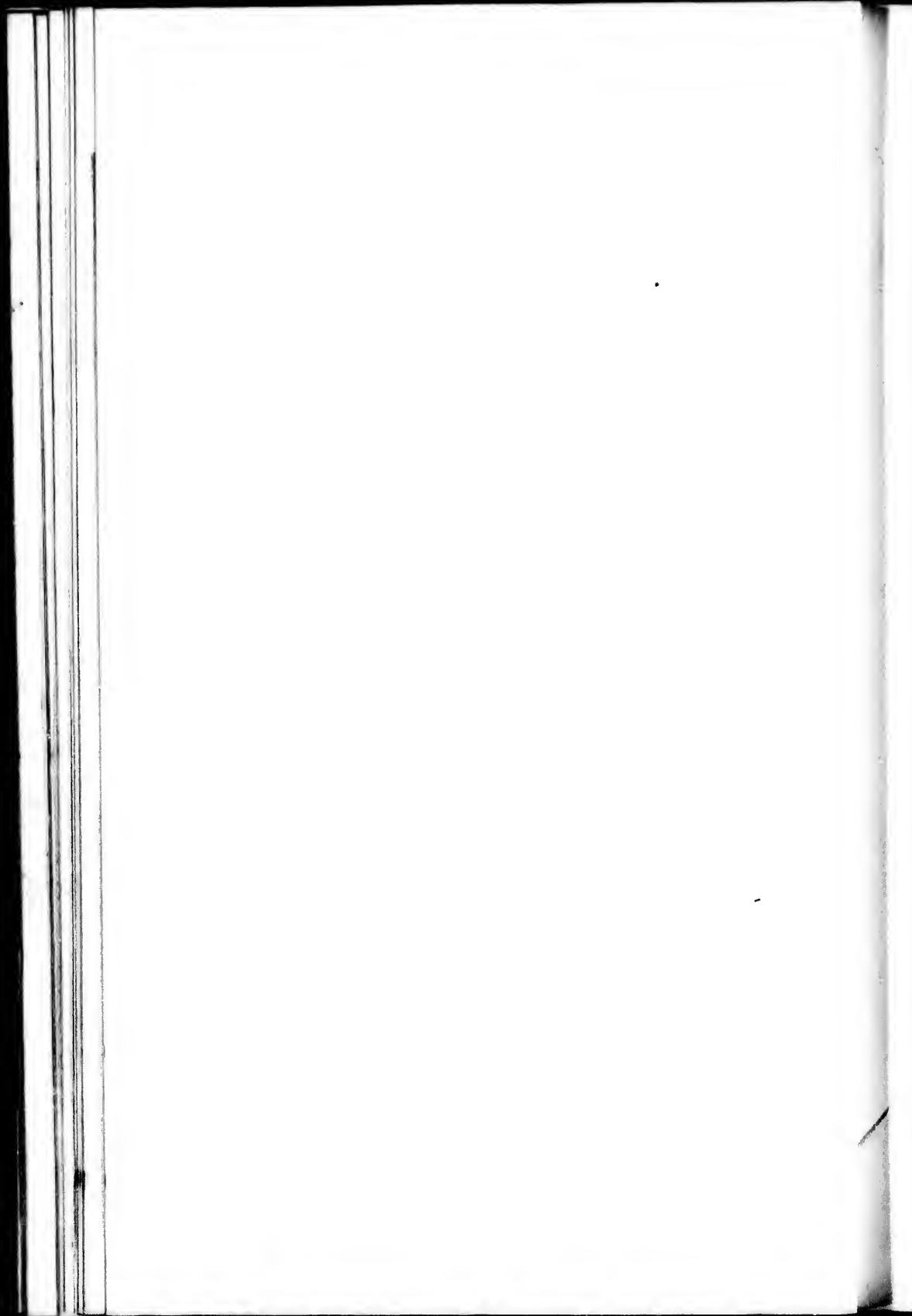
Entire Leaved Strychnos *Strychnos & Families Entaris*



Stryphonia Integrifolia

Endre Leonard Spegazzini

Stryphonia à Feuilles Entières



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 **GRAY**, *Flora*. 1, 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.)

Natural Order, ZANTHOXYLÆ, (Ad. JUSSICU.) *Linnaean Classification*, DIOECIA PENTANDRIA.

ZANTHOXYLUM. (LINN.)

DIOECIOUS.—*Sepals* small, 3 to 9. *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* 1 to 5, elevated on a round or cylindric torus, (or place of insertion,) distinct, with 2 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 trifoliolate, 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, 4 or 5; ovaries usually 1 to 3. Styles short.*—FAGARA, (Jacquin), and OCHROXYLUM, (Schreber.)

CAROLINA PRICKLY-ASH.

ZANTHOXYLUM CAROLINIANUM; ramis petiolisque plerisque aculeatis, aculeis stipularibus oppositis, foliis pinnatis 4-6-jugis, glaberrimis, foliolis ovato-lanceolatis inequilateralis subfulcatis petiolulatis crenato-serrulatis lucidis, floribus paniculatis; terminalibus sepalis minutis, capsulis ternis sessilibus.

ZANTHOXYLUM Carolinianum. LAMARCK'S Dict. vol. 2, pp. 39, 40.

CATESBY'S Carol. vol. 1, tab. 26. TORREY and GRAY, Flor. Amer. 1, p. 214.

Z. tricarpum. MICH. Flor. Bor. Am. 2, p. 235. PURSH. vol. 1, p. 210.

DECAND. Prod. vol. 1, p. 726.

Z. fraziniifolium. 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 30 to 40 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

* Mr. James Reed.

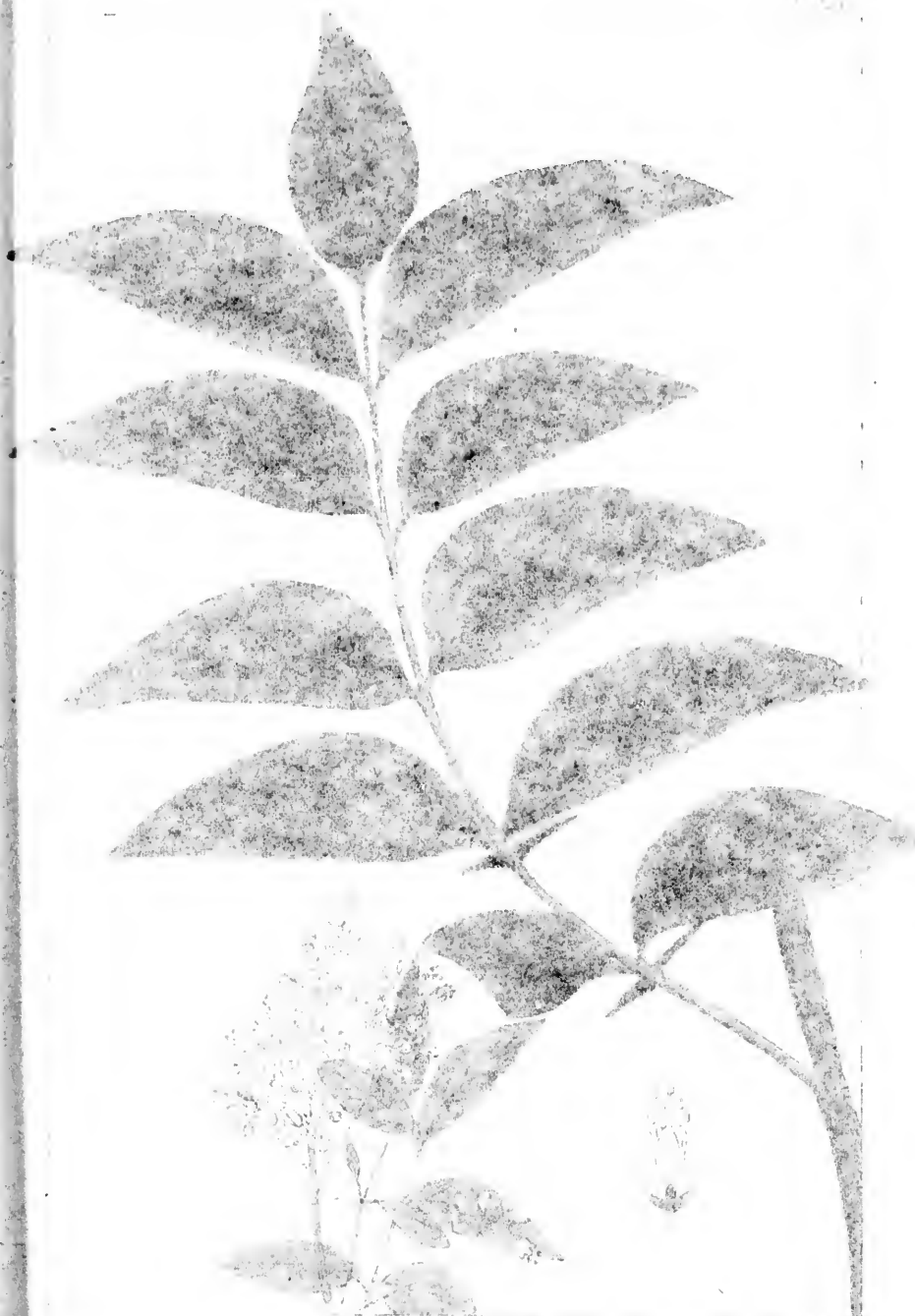
† Doctor Baldwin.

§ Travels in Florida, &c., p. 88.

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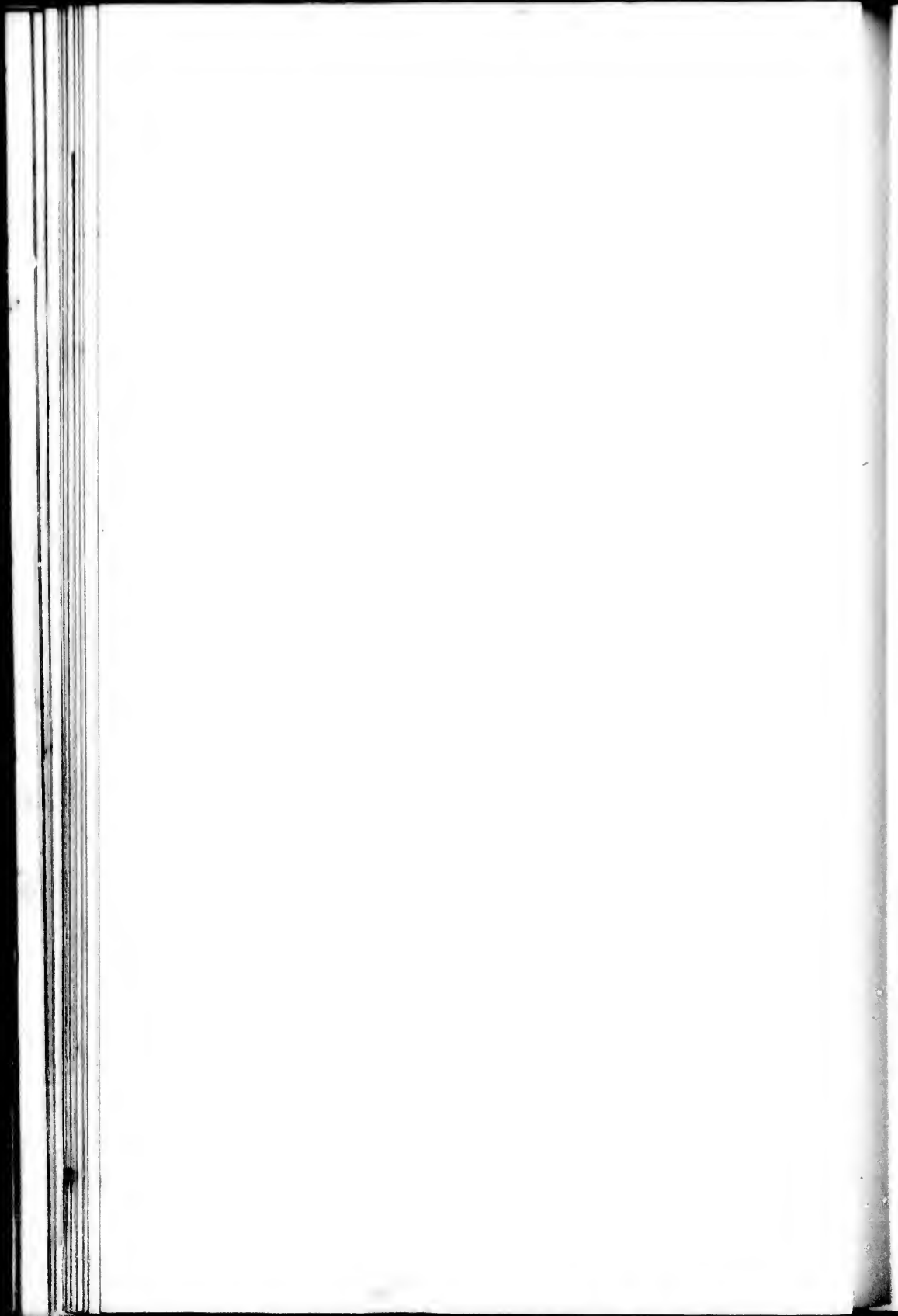
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Xanthoxylum Carolinense
Carolina Bushy Tree

Carolinense



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 projections, 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 Herculis*, is yellow and solid, and hence the generic name of *Zanthoxylum*, 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 20 feet.

As a medicinal plant, the bark of the present species is considered a powerful stimulant, sudorific, diuretic, and febrifuge. Burtram mentions that it is bitter to the taste, slightly odorous, colouring 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 chrySTALLINE substance which they call *Zanthopicrite*; a yellow colouring matter which appears to be the source of the bitter taste of this bark, a red colouring matter and some salts.

The leaves in the present species are very smooth, pinnate in about 5 or at most 6 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 3, sometimes 2, but never 4. 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 number 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 16 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 40 or 50 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 tooth-ache.

PLATE LXXXIII.

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

LONG-LEAVED PRICKLY-ASH.

ZANTHOXYLUM MACROPHYLLUM, ramis petiolisque aculeatis, aculeis sparsis, foliis pinnatis 6-8-jugis, junioribus petiolisque puberulis, foliis lanceolatis acuminatis vix inequalibus, petiolulatis crenato-serrulatis, floribus paniculatis terminalibus, capsulis subsolitariis brevi-stipitatis.

This elegant and curious tree is of frequent occurrence

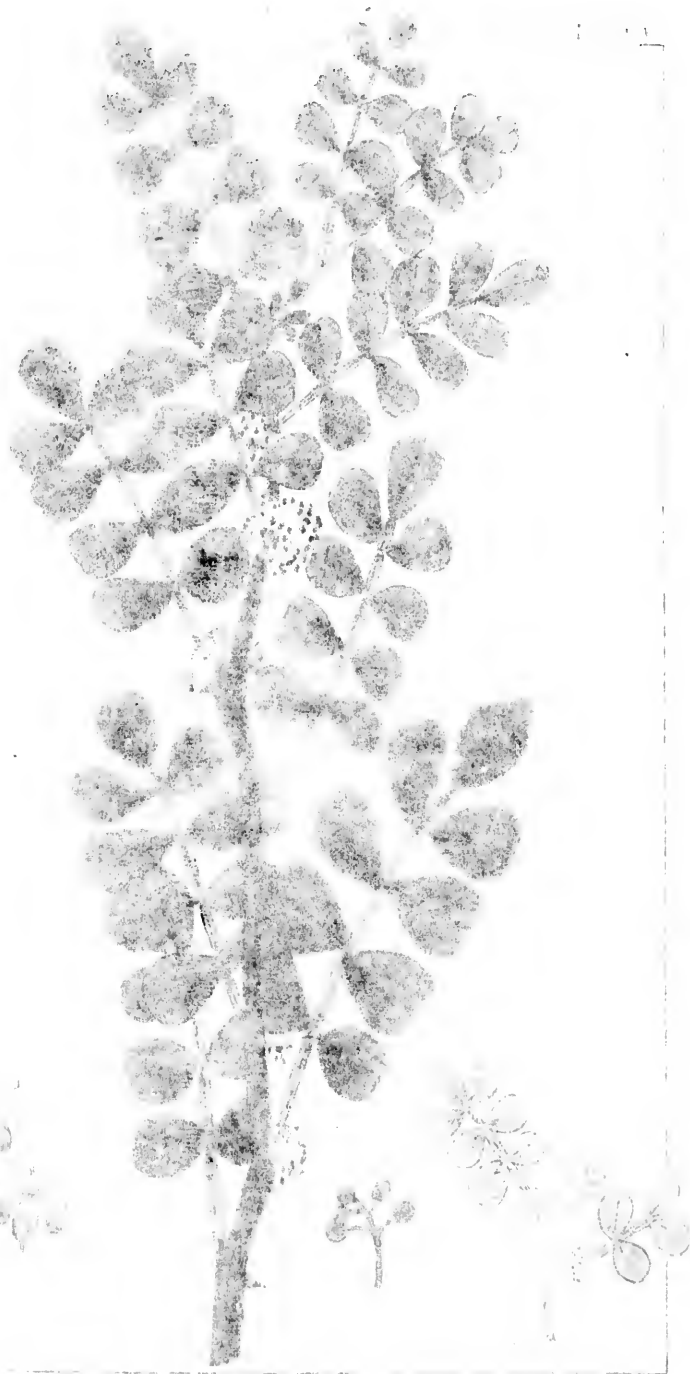
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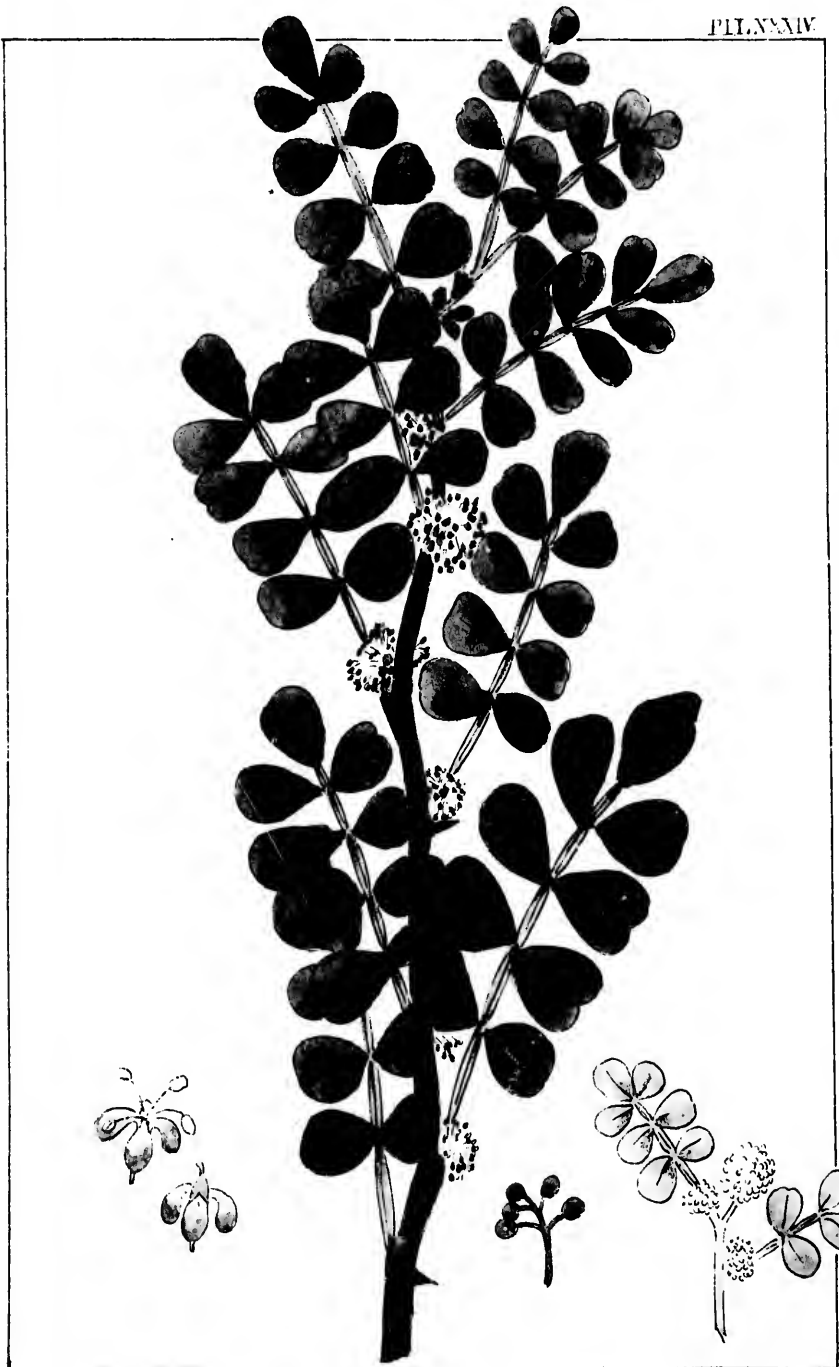
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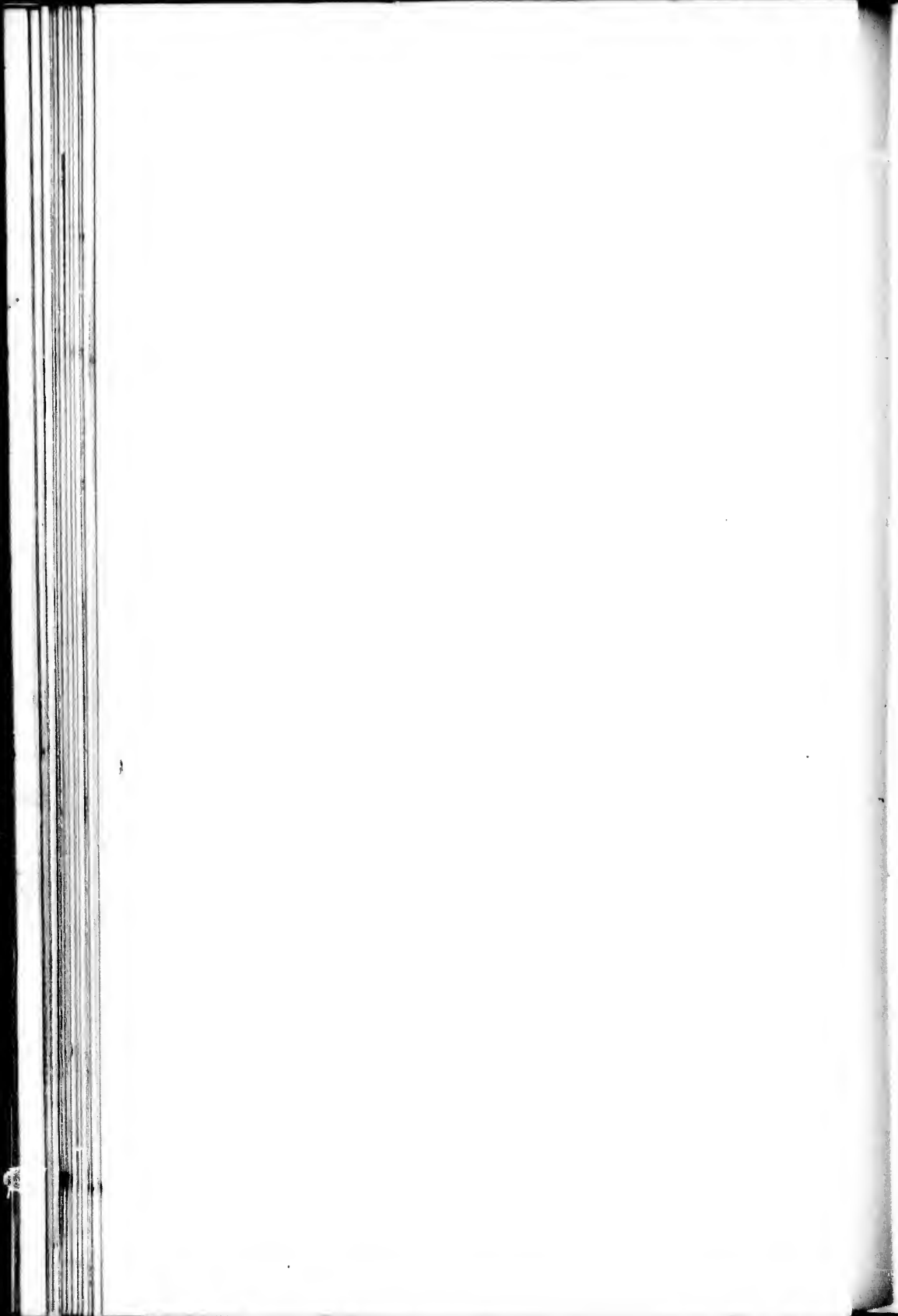
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Xanthoxylum Pterota

Bastard Iron Wood

Clarendon Hill



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 towards the summit, and forming a roundish top. The height is about that of an ordinary apple tree, and the diameter about a foot or 18 inches; the stem is, as usual, rough with prismatic acute excrescences, which in an earlier stage of growth have been mere thorns. That it must be a very different species from the preceding, is evident by the climate it inhabits; the other no where 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 8 pair of leaflets. The leaflets are about 3 inches long and an inch wide, very distinctly acuminate, 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 2 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 1, rarely 2, and shortly stipitate.

BASTARD IRON-WOOD.

ZANTHOXYLUM PTEROTA, *foliis pinnatis, foliolis obovatis emarginatis, petiole communi marginato articulato inermi.* WILLD. Sp. Pl. 2, p. 666, (under *Fagara*.)

ZANTHOXYLUM Pterota, (HUMB. BOEPL. and KUNTH.) prickly; leaves unequally pinnate; leaflets 3 to 6 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 2; capsule solitary, prickles in pairs, stipular, hooked. KUNTH. Synops. vol. 3, p. 325. TORREY and GRAY Flor. Suppl. vol. 1, p. 680.

PTEROTA subspinosa, foliis minoribus per pinnas marginato-alatas dispositis, spicis geminatis ularibus. BROWN, Jamaica, p. 146, tab. 5, fig. 1.

Lauro affinis iasmini folio alato costa media membranulis utrinque exstantibus alata, ligno duritie ferro vix cedens. SLOANE, Jamaica. Hist. vol. 2, p. 25, tab. 162, fig. 1.

An Syderoxyllum Surinamense Lentiscini minoribus foliis, radchi media appendicibus 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 12 to 20 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 p. 74, 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 4 to 6 pairs, are obovate-oblong, and crenate on the margin, somewhat notched at the extremity, smooth and subsessile, scattered with pellucid punctures; the petiole about 5 inches long, is marginated. The flowering panicles branched, axillary and terminal. Flowers 4 to 6 together, subsessile, greenish-yellow and fragrant. The calyx small and 4 cleft. Petals 4. Stamens 4, longer than the petals, with the anthers yellow. The ovary mostly

single, ovate; style 1; conical; mature fruit the size of a grain of black pepper, 1-celled, 2-valved, 1-seeded. The seed smooth, shining, and of a dark brown colour.

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 inaequalibus, petiolo communi subaculeato, paniculis terminalibus.* WILLD. Sp. pl. l. c. No. 9. PER-
 SOON Synops. vol. 2, p. 615. DECAND. Prod. vol. 1, p. 727.
- ZANTHOXYLUM *Clava Herculis?* MACFADYEN, Flora Jamaica. p. 194.
 (non. WILLD.) β . LAM. Dict. vol. 2, p. 39.
- Z. americanum sive Herculis arbor aculeata major, juglandis foliis alternis parum sinuosis.* PLUK. Almag. p. 396, t. 239, fig. 6?
- Evonyma affinis arbor spinosa, folio alato, fructu sicco pentagono et pentacocco, ligno flavo santali odore.* SLOANE, catal. Jamaica. vol. 1, p. 138. Hist. vol. 2. 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 20 feet in height, producing a valuable timber, for house-building. The wood is yellow, close-grained, and according to Sloane, has the aromatic odour 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 40 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 towards the ends of the branches. They are unequally pinnate, and consist of 6 to 8 pairs; the leaflets are mostly alternate, and become coriaceous, 2 or 3 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 4 or 5, rather downy, containing black seeds.

FLORIDA SATIN-WOOD.

ZANTHOXYLUM FLORIDANUM, *inermis*, *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 40 or 50 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

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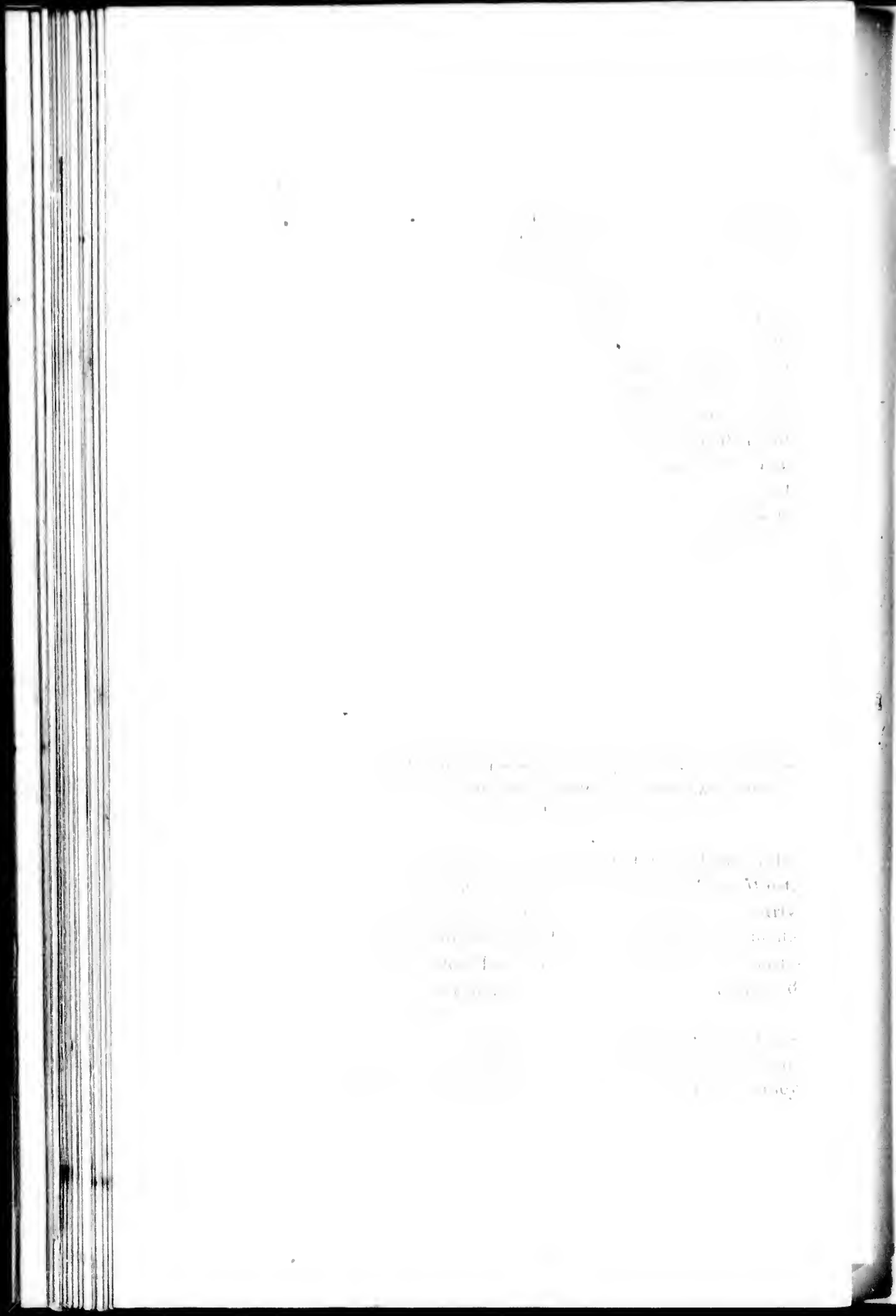
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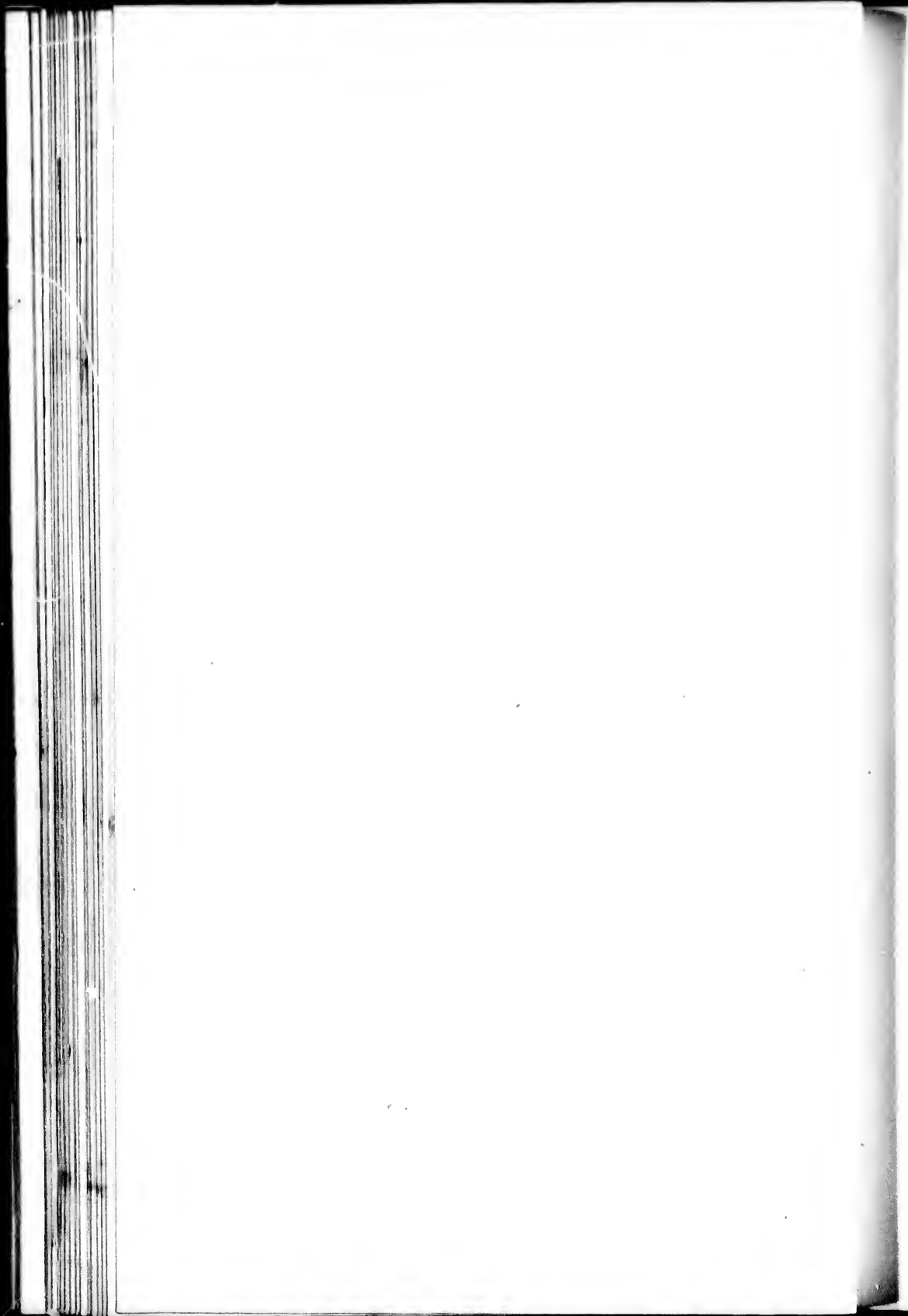


G. Meyer del.

Xanthoxylum Floridanum.

Florida Sassafras

Cavalier des Florides



are alternate, on common petioles about 2 inches long; the leaflets 2 or 3, rarely 4 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 translucent 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 5-toothed; the petals much larger, oblong-ovate, 4 to 5, with the same number of Stamens. The panicle of female flowers is smaller than in the other sex, the calyx and corolla similar. The germs are mostly 2, sometimes 3, 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 4 and mostly 5 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 do. *c.* The ripe capsule.

LIGNUM VITÆ TREE.

(GAYAC, Fr.)

Natural Order, ZYGOPHYLLÆE, (R. BROWN.) *Linnæan Classification*, DECANDRIA MONOGYNIA.

GUAIACUM.* (PLUMIER and DECAND.)

Calyx 5-parted, obtuse, deciduous, the divisions unequal. *Petals* 5. *Stamens* 10, with the filaments naked or partly appendiculate. *Style* and stigma 1. *Capsule* substipitate, 2 or 3 to 5-celled, with 2 to 5 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, peduncles axillar and terminal, few and mostly clustered, 1-flowered, the flowers blue.

SMALL-LEAVED LIGNUM VITÆ.

GUAIACUM SANCTUM, *foliis 5-7-jugis, foliolis ovalibus obtusis mucronulatis; petiolis ramulisque subpubescentibus*. DECAND. Prod. vol. 1, p. 707.

GUAIACUM SANCTUM, *foliolis multijugis obtusis*. LINN. COMMEL. Hort. vol. 1, p. 171, tab. 88. LAM. Encyc. vol. 2, p. 615.

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

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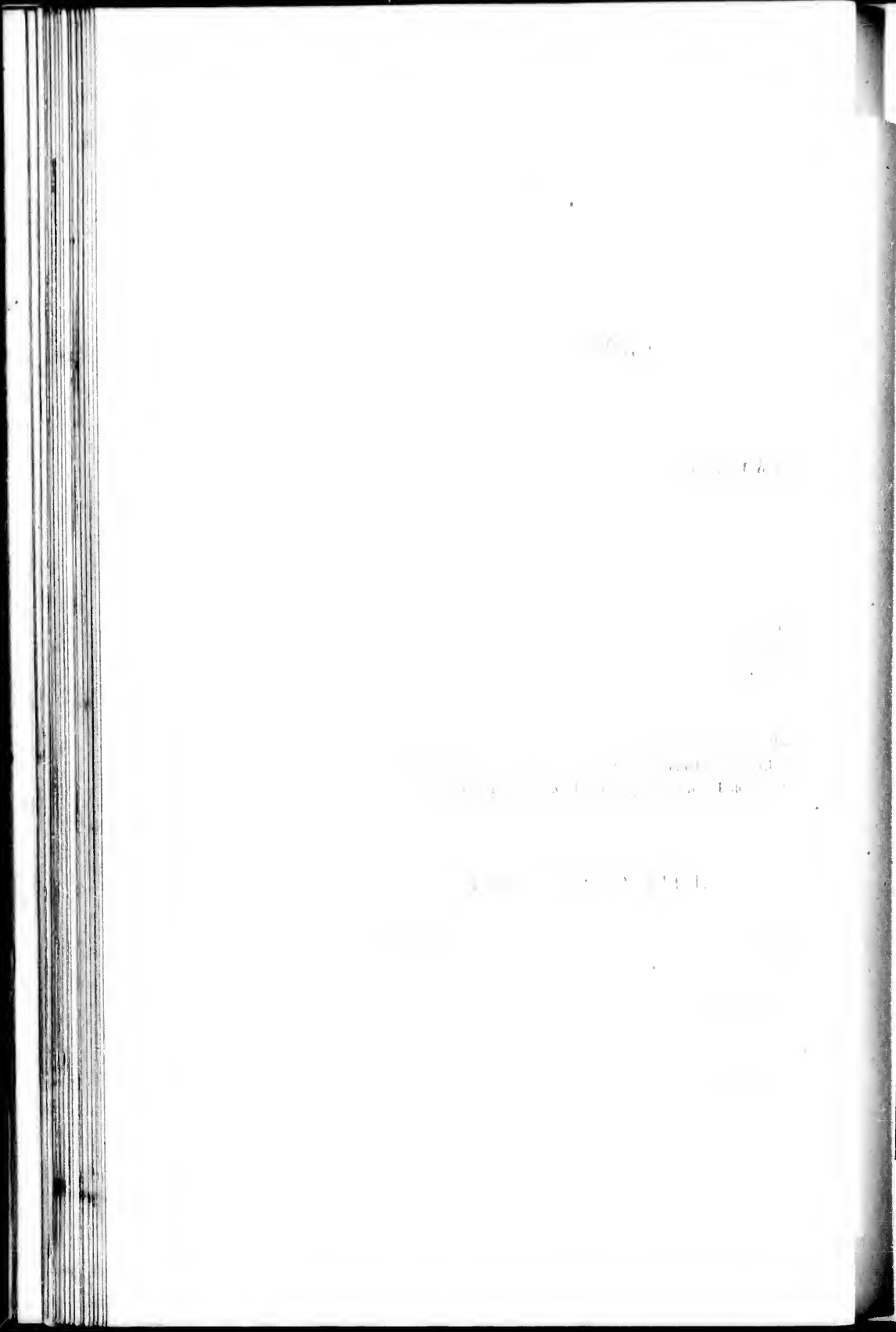
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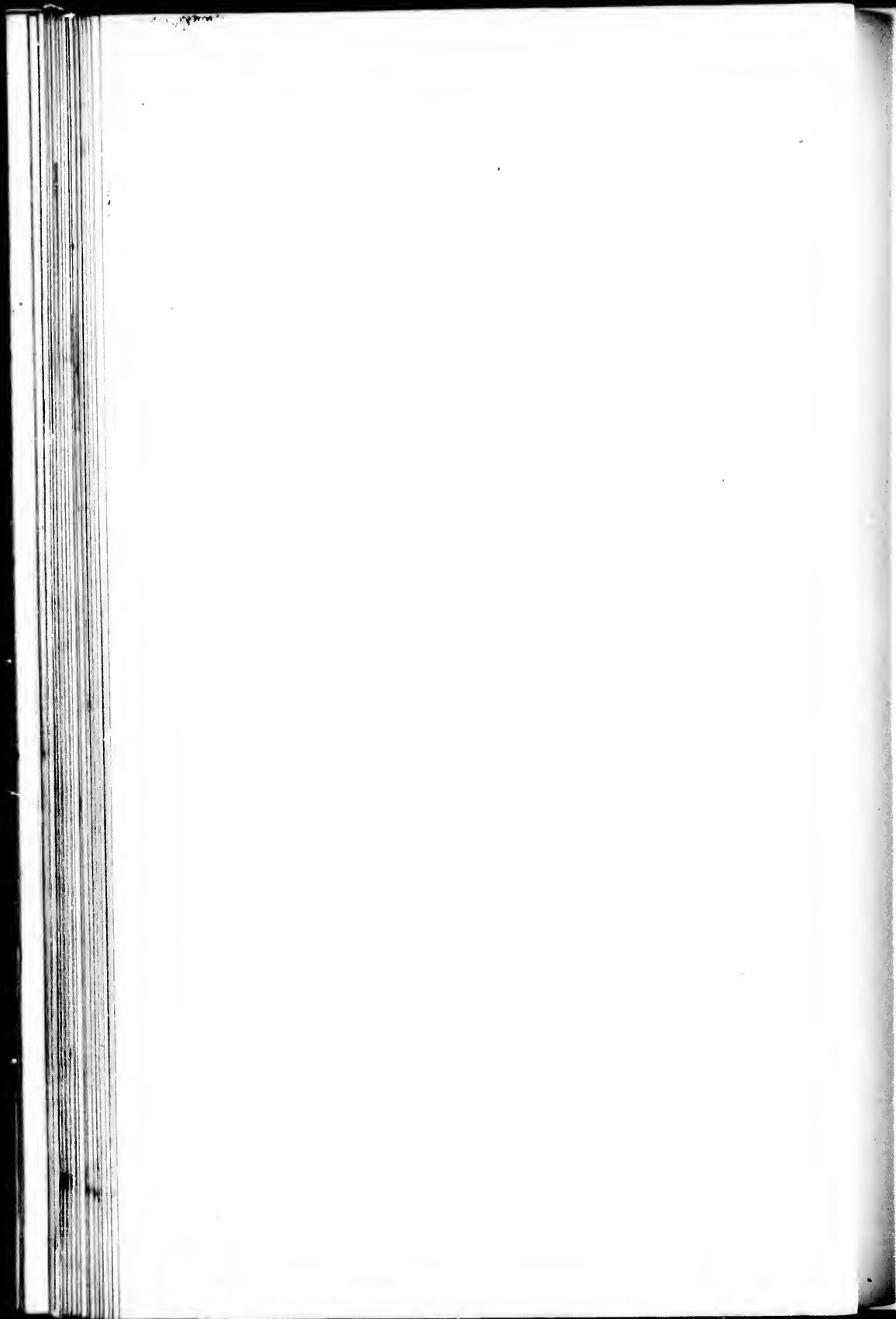


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Guaiacum sanctum.

Small-leaved Tignonum Vibe

Gayac Bois saint



Jasminum vulgo americanum. S. *Erythra affinis occidentalis, alatis ruscii foliis, micifera, cortice ad genicula fungoso.* PLUK. Almag. p. 139, tab. 94, fig. 4.

Lignum Vitæ ex Brasilia. BLACKWALL, tab. 350. fig. 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 in 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 colour 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 2, or mostly 3 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 2 to 4 together. The segments of the calyx are nearly smooth and oblong. The petals 5, are oval, rounded, partly unguiculate, smooth and perfectly entire. The capsule is turbinate, and furnished mostly with 5 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 1 to 5 *cwt.* each, and seldom presents a diameter of more than 12 to 18 inches.

The peculiar substance called Guaiacum, (now Guaiacine), is procured from this tree. It is friable, semitransparent, light, of a brownish-green colour when exposed to to the air and light, and diffuses on burning a somewhat agreeable odour. 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 resins in the change of colour 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 antisymphilitic, 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 Guaiac 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 externally warm, or if the guaiac 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 tooth-ache, &c.

It is probable that our variety β (*Guaiacum 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. α . The fruit.

BITTER WOOD.

(QUASSIE, Fr.)

Natural Order, SIMARUBACEÆ, (Richard.) *Linnean Classification*, DECANDRI/ MONOGYNIA.

SIMARUBA.* (AUBLET.)

Flowers MONOECIOUS, DIOECIOUS OR POLYGAMOUS.—*Calyx* small, 5-parted. *Petals* 5, somewhat larger than the calyx. *Stamens* 5 to 10, 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 inter-tropical regions of America with a very bitter bark and milky juice: the leaves alternate, pinnated, and without stipules.

GLAUCOUS BITTER-WOOD.

SIMARUBA GLAUCA, *floribus monœcis, masculis decantris?, stigmatè 5-partito, foliis abrupte pinnatis, foliolis alternis subpetiolulatis glabris glaucis.* DECAND. Prod. vol. 1, p. 733. HUMB. BONPL. et KUNTH. Nov. Gener. Am. vol. 6. p. 16.

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

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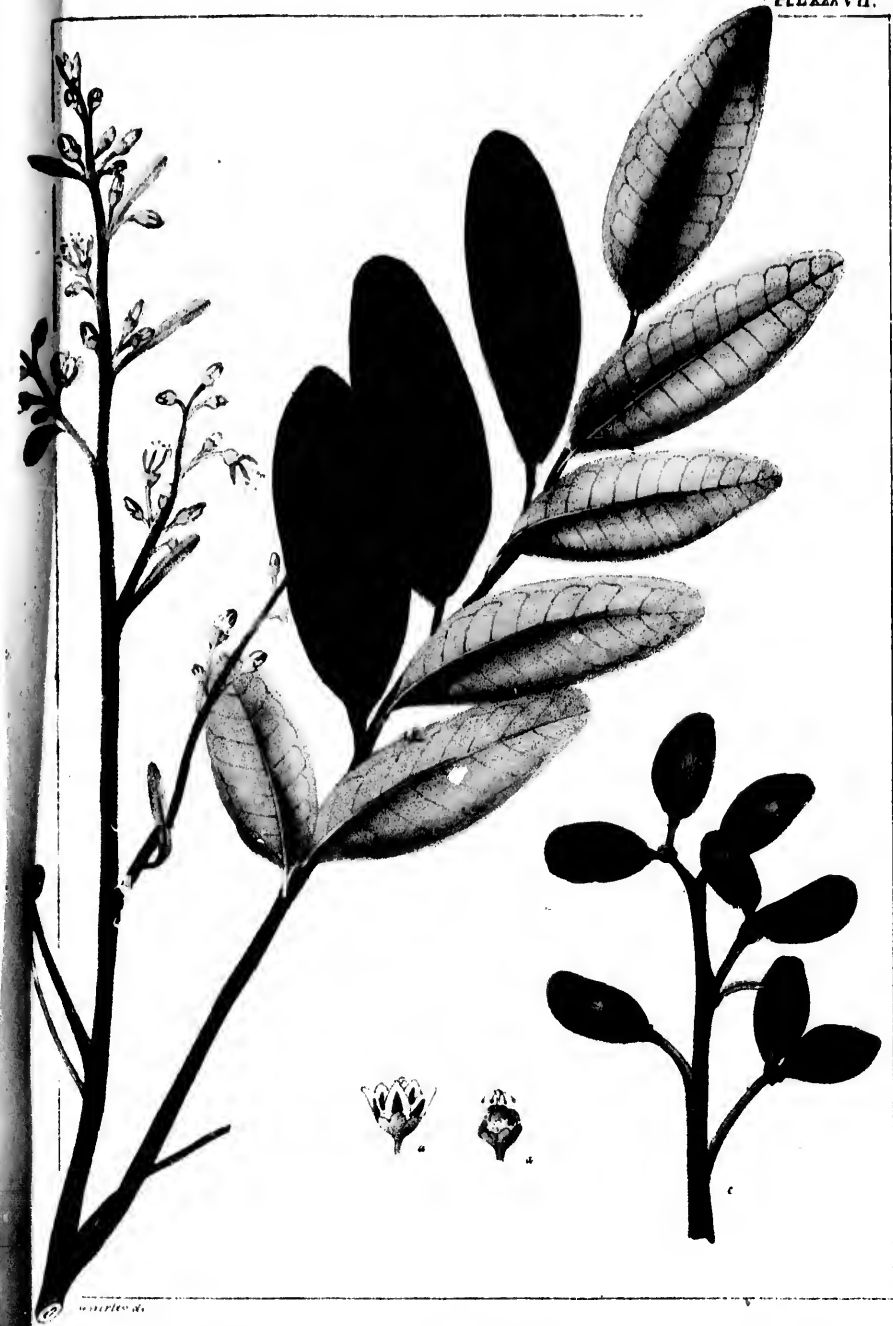
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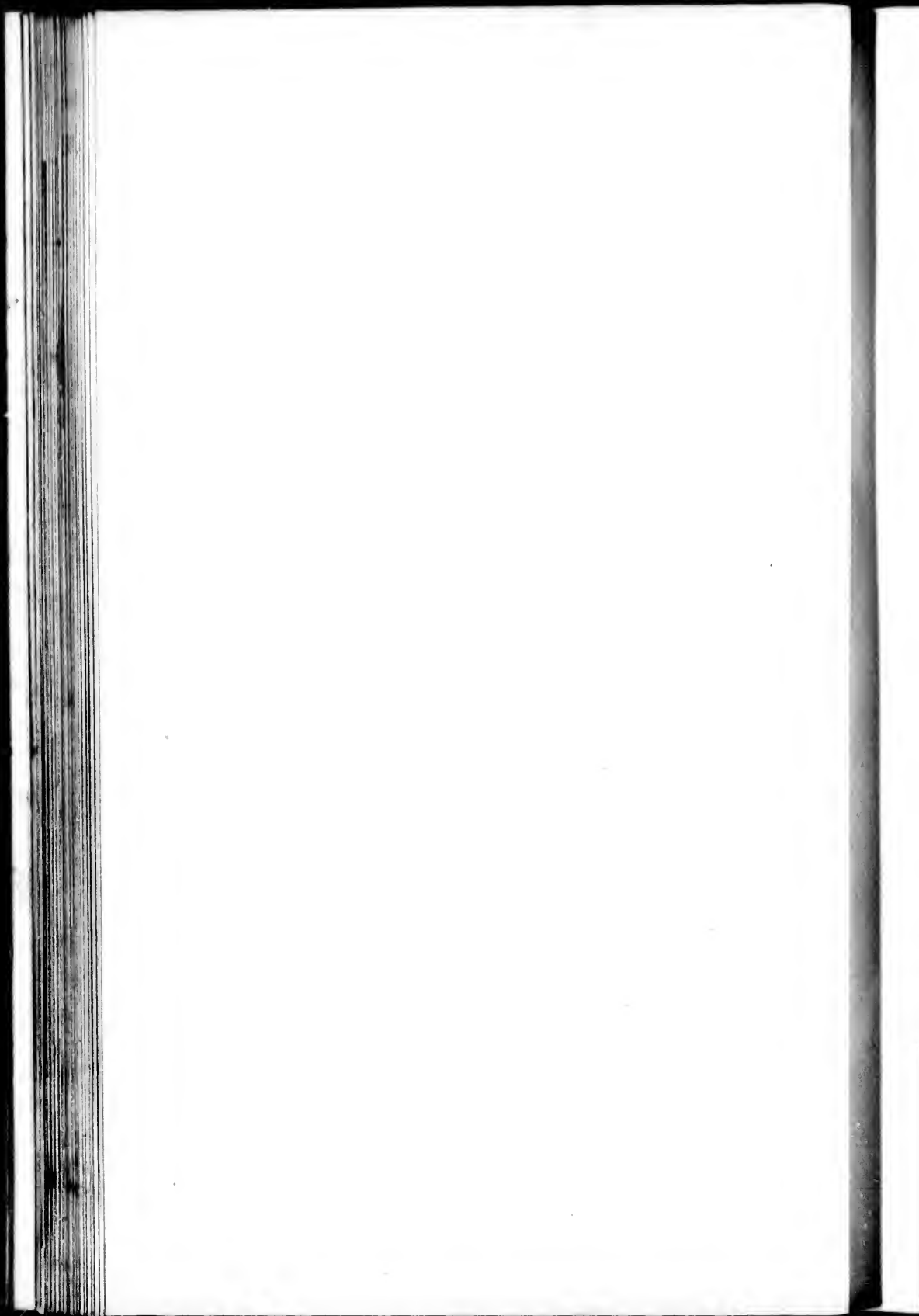


Simaruba glauca

Glaucous Bitter-Wood

Simaruba glauca

Simaruba glauca



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 60 feet, with a diameter of 2½ feet. The timber, Dr. Macfadyen remarks, is of an excellent quality, the wood being of a yellowish colour, 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 bed-posts 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 colour 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 anti-spasmodic, being employed with advantage in intermittent and bilious fevers, obstinate diarrhoea, dysentery, and dyspeptic affections. The wood is much used in England to give bitterness to malt liquors, though the use of it subjects those 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, 5 or 6 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 dioicous, 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 bracts. The petals are oblong-lanceolate. Stigmas 5, revolute, smooth, germs the same number. The drupes or capsules are seldom more than 3 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 1-seeded. From their appearance they are in Jamaica called Bitter or Mountain Damsons.

PLATE LXXXVII.

A branch of the natural size.

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Coccoloba uvifera

Sea Side Grape

Raisin or Grapes



Alphabetical List of the American Colonies
1763 AND 1776

By JOHN H. COOPER, Esq., of New York.
Published by G. & C. VAN NEST, No. 12, NASSAU ST. N. Y.

A complete list of tropical America with a description of the principal productions and a list of the principal cities.

CONTENTS

Introduction
List of the Colonies
List of the Principal Cities
List of the Principal Productions
List of the Principal Ports
List of the Principal Rivers
List of the Principal Mountains
List of the Principal Lakes
List of the Principal Seas
List of the Principal Islands
List of the Principal Bays
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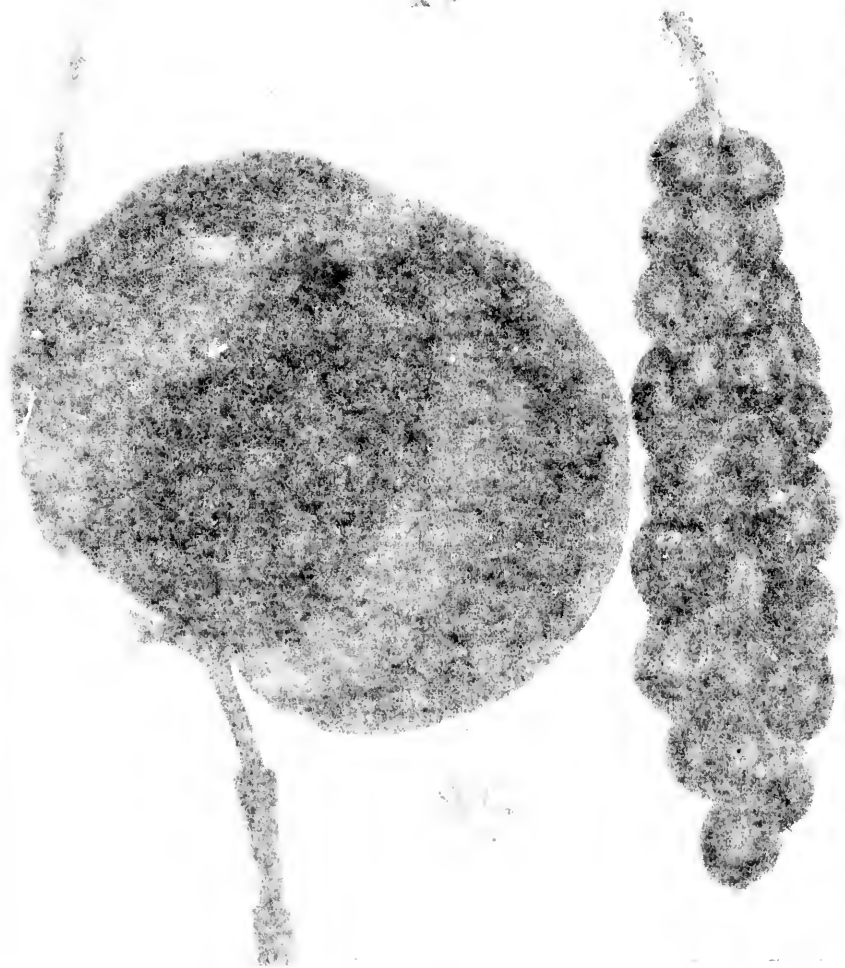


Fig. 1-2

Rumex crispus

COCOLOBA.*

(LINN.)

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

Flowers PERFECT, or POLYGAMOUS.—*Calyx* 5-parted, petaloid, at length converted into a berry. *Corolla* none. *Stamens* 8, anthers rounded. *Ovary* 3-sided: stigma 3, 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.

SEA-SIDE GRAPE. (RAISINIER DE MER).

COCOLOBA UVIFERA, *foliis cordato-subrotundis nitidis*. LINN.
WILLD. Sp. pl. vol. 3, p. 457. LAMARCK. *Illust.* tab. 316, fig. 2.
GERT. t. 45.

COCOLOBA *foliis subrotundis integris nitidis planis, racemis fructuum cernuis*. JACQ. *Amer.* p. 112, tab. 73. MILL. *Dict.* No. 1.

COCOLONUS *foliis crassis orbiculatis sinu aperto*. BROWN, *Jam.* p. 208.

POLYGONUM *caule arborco fructibus baccatis*. LINN. Sp. pl. Ed. 1.

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

UVIFERA *litorca, foliis amplioribus fere orbiculatis crassis americana*.

PLUKEN. *Almag.* p. 394, tab. 236, fig. 7.

Gucjabara racemosa, foliis coriaccis subrotundis, PLUMIER, *ic.* t. 145.

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

Prunus maritima racemosa, folio subrotundo glabro, fructu minore purpurco. SLOANE, Jamaica. 183. Hist. vol. 2, p. 129, t. 220, f. 3.

CATESBY, Carol. 2, t. 96.

Populus americana rotundifolia. BAUHIN'S Pinax. p. 430.

THE Sca-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 8 to 10 inches in diameter. The trunk attains the height of from 25 to 60 feet, by 2 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 colour, and by boiling communicates the same fine colour 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 colour 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 sub-acid 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

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Small leaved Sea side Grape

Cocoloba parvifolia.

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à petites feuilles

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PLANT. LXXVIII

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PLANT. LXXIX

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situations.



Asplenium adnigrum

1845

polygamous flowers, are 6 to 12 inches long, articulated upon very short peduncles, and grow by clusters, at first erect, but in fruit pendulous. The nut has a thin shell, half 3-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 racemo of fruit.

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, Amer. 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 40 feet. It appears to have a near affinity to *C. obtusifolia* of Carthagen, 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 grey bark. The leaves, smooth and even, situated at the extremities of the branchlets, are oblong-lanceolate, about 3 inches long, and a little more than an inch in width, rather acute at either end. Raceme of the *fertile* plant 3 to 4 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 3 or 4 together.

In the variety *β. ovalifolia*, 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.

SAPOTA PLUM.

(SAPOTIER. Fr.)

Natural Order, SAPOTEE. (JUSS.) 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 par-
 petalous alternate scales within and attached to the corolla. *Stamina*
 4 to 6; anthers adnate, ovate, with the 2 cells parallel. Style subu-
 late, exserted. *Berry* with 8 to 12 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.

* The Greek name of the wild pear.

SAPOTILLA OR NASEBERRY BULLY TREE.

ACHIRAS ZAPOTILLA, *floribus aggregatis, foliis ellipticis utrinque obtusis, floribus hexandris.*

ACHIRAS SAPOTA. β . (*Zapotilla*) *brachiatus diffusus, fructu subrotundo, cicatricula mucrone breviori.* BROWNE, *Jamaic.* vol. 2, p. 200.

ANONA maxima, *foliis laurinis glabris viridi-fuscis, fructu minimo.* SLOANE, *JAM.* 206. *Hist.* vol. 2, p. 172, tab. 169, f. 2. RAY, *Dendr.* p. 79. CATESBY'S *Carol.* vol. 2, 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 30 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 2 or 3 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,

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CHAPTER 10

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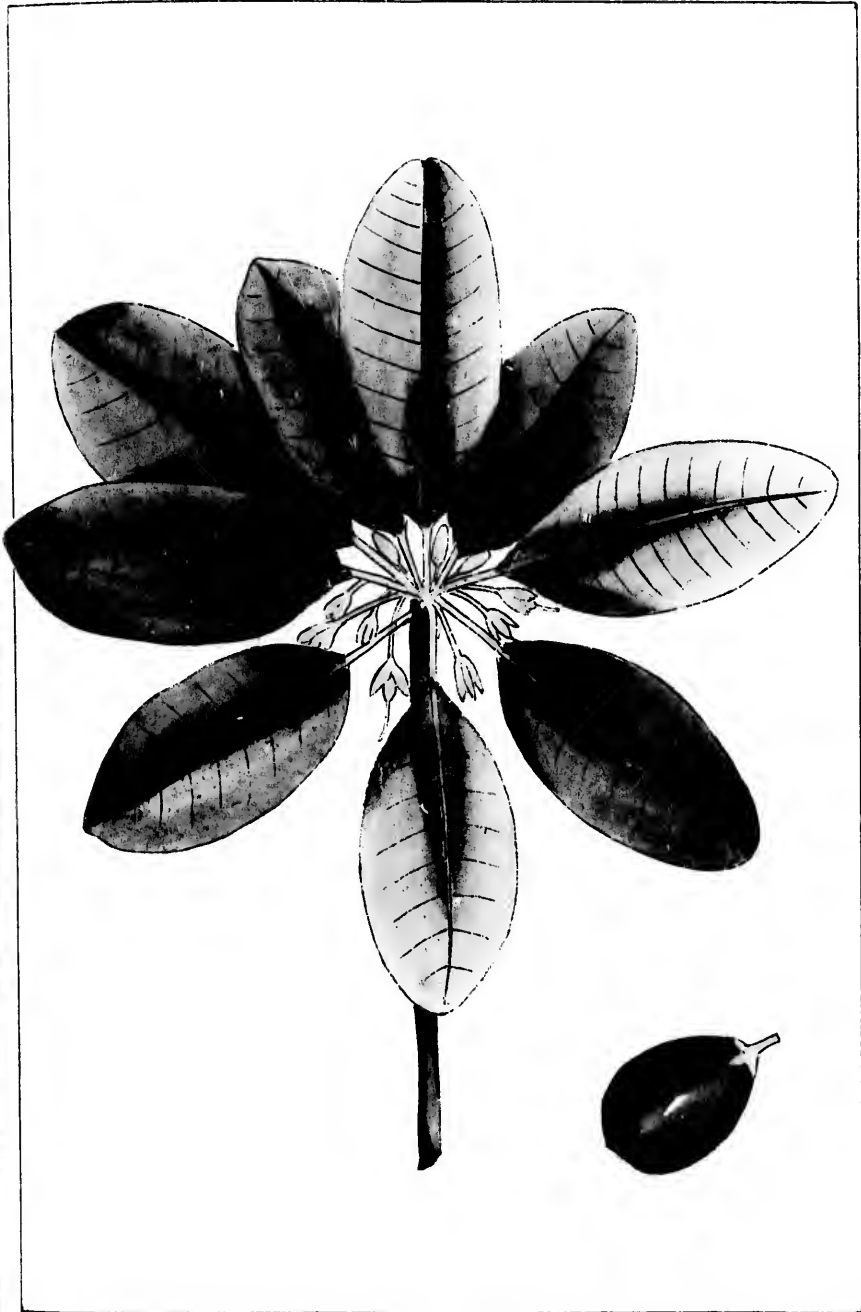
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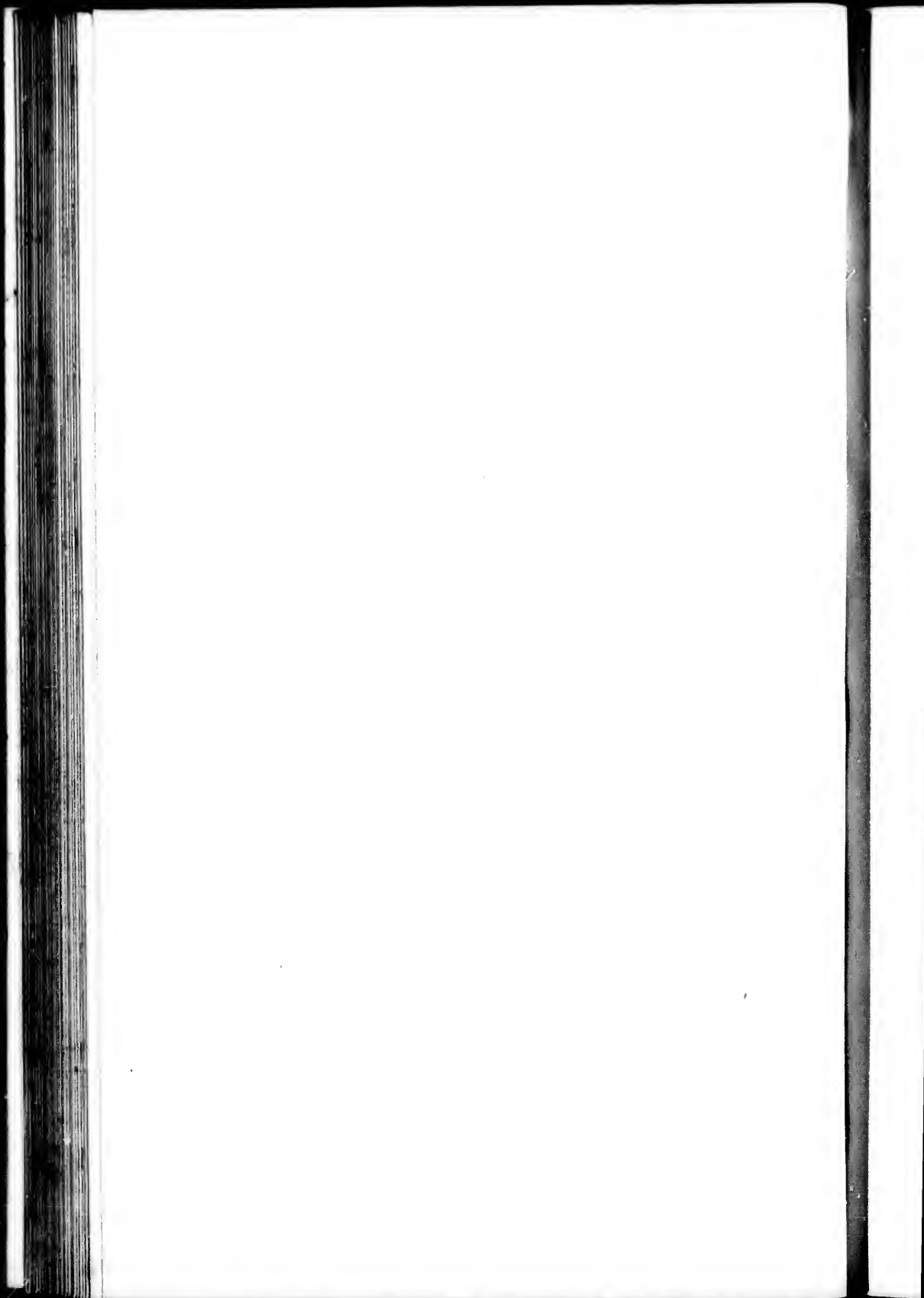
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Small Zapotilla

Achras Zapotilla.

Zapotiller Commun.



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 Pine-apple. 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 40 or 50 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 colour.

The summit of the Florida Sapotilla is spreading, and the branches covered with a light gray bark. The leaves are clustered towards the summits of the twigs, and are about 2 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 2 or 3 together in the axils of the leaves. The calyx is brown, silky, and always closed, with 3 of the segments external. The corolla is cream-coloured 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 Jesuit's 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. α . The fruit, somewhat reduced.

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Smooth-leaved Bumelia

Bumelia lycorides.

By Walter & Charles de Laros.



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SOUTHERN IRON-WOOD.

(L'ARGAN, Fr.)

Natural Order, SAPOTEEÆ, (JUSS.) *Linnæan Classification*,
PENTANDRIA MONOGYNIA.

BUMELIA.* (SWARTZ.)

Calyx 5-cleft, persistent. *Corolla* rotate, 5-parted, internally with the same number of toothed or trifid incurved petaloid scales. *Stamens* 5 or 10, 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 1 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.

† *Leaves Deciduous.*

SMOOTH-LEAVED BUMELIA OR IRON-WOOD.

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

BUMELIA lycioides. PURSH. Flor. Bor. Amer. 1, p. 155. ELLIOTT, Sketches, 1, p. 287. PERSON, Synops. vol. 1, p. 237.

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

Sideroxylon lycioides, Linn. Sp. pl. DICHANEL. Arb. 2, p. 260, t. 68.

MICH. Flor. Bor. Amer. 1, p. 122.

Sideroxylon leve, WALTER, Flor. Carol. p. 100.

LYCIOIDES. LINN. Hortus Cliffort. p. 488.

A SMALL and rather elegant tree, from 12 to 40 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 colour 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-grey 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 3 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 5 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 unfavourable shady situation, probably 40 years old or more, has attained the height of about 40 feet, but being slender, is not more than 8 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.



OBLONG-LEAVED BUMELIA.

BUMELIA OBLONGIFOLIA, *spinosa erecta, foliis lanceolato-oblongis obtusis basi attenuatis subtus molliter pilosis, pedunculis brevissimis calycibusque villosis.* NUTT. Gen. Amer. vol. 1, p. 135.

This species, which becomes a tree 18 or 20 feet in height, is by far the most hardy of the genus, being indige-
nous 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 fœtid, 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-grey hairs. The leaves somewhat resemble those of *B. lycioides*, but they are larger, being 3 to 4 inches long by 1 to 1½ 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.

RUSTY-LEAVED BUMELIA.

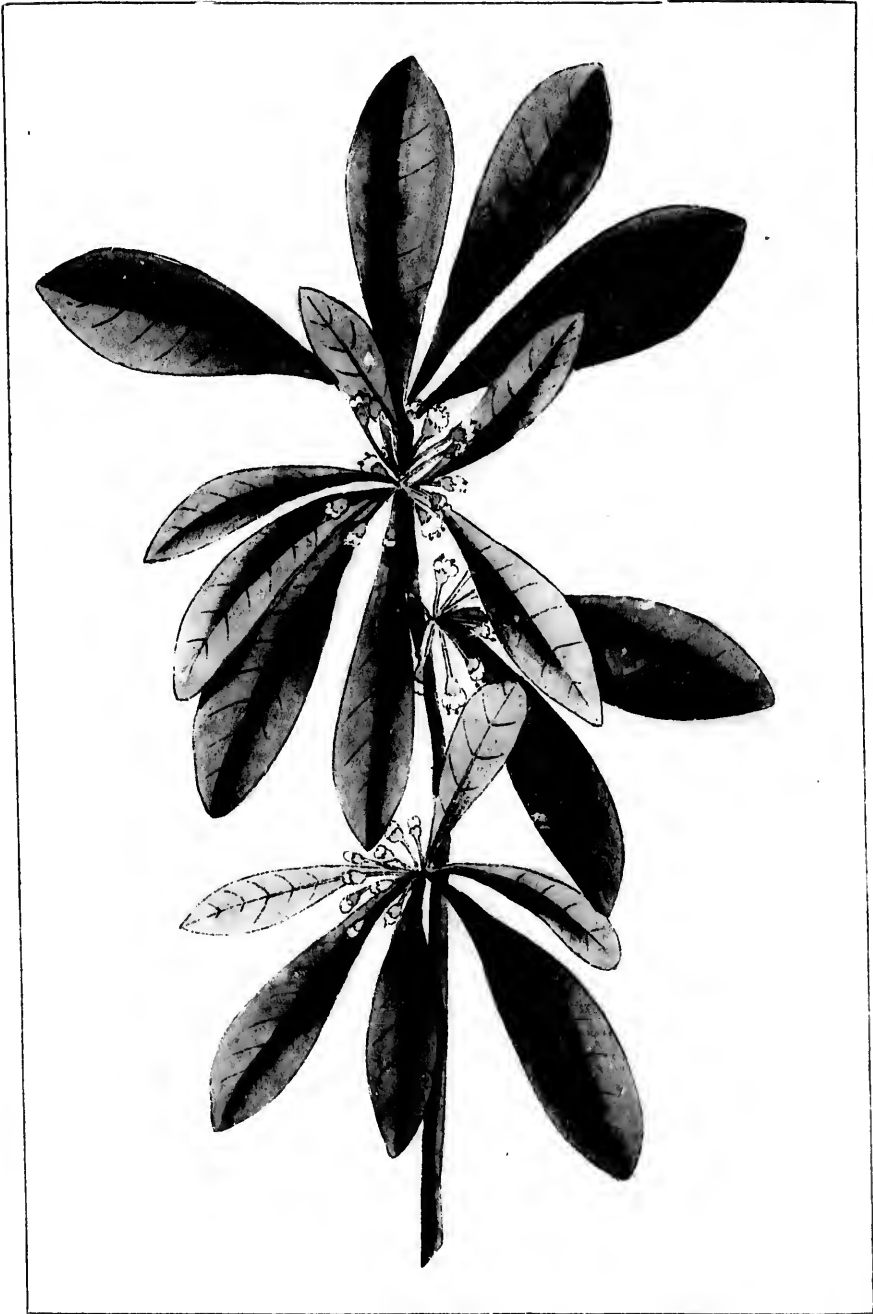
BUMELIA FERRUGINEA, *inermis*, *foliis obovatis pubescentibus obtusis subtus ferrugineo-tomentosis, corymbis multifloris, calycibus pedunculisque rufo lanatis, floribus pentandris.*

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 1½ inches by 2½ 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

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THE HISTORY OF THE

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leaves, young branches and calyx. Its nearest affinity is at the same time to the preceding species.

SILKY-LEAVED BUMELIA.

BUMELIA TENAX, *erecta, ramis junioribus spinosis, foliis cuneato-lanceolatis plerumque obtusis, subtus sericeo-nitentibus, sub-aureis, calycibus villosis.*

BUMELIA tenax. WILLD. Sp. pl. 1, p. 1085. PERSOON, Synopsis, vol. 1, p. 237. ELLIOTT, Sketch. vol. 1, p. 288. LOUDON, Encyc. Plants, p. 149, t. 2394.

BUMELIA chrysophylloides. PURSH. Flor. Bor. Amer. 1, p. 155.

SIDEROXYLON tenax. LINN. Mant. p. 48. JACQUIN, Collect. vol. 2, p. 252.

SIDEROXYLON chrysophylloides. MICH. Flor. Bor. Amer. 1, p. 123.

SIDEROXYLON sericeum. WALTER, Carol. p. 100.

CHRYSOPHYLLUM Carolinense. JACQ. Observ. vol. 3, p. 3, tab. 54.

THIS very elegant leaved species becomes occasionally a tree 20 to 30 feet high, with hard tough wood, and the trunk clothed with a light grey 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 colour; adding a peculiar elegance and splendour 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 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 peduncles of the ses-

sile 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 5-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. Bosc remarks that at the approach of evening, the flowers give out an agreeable odour. 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.

WOOLLY-LEAVED BUMELIA.

BUMELIA LANUGINOSA, spinosa; ramulis patentissimis, pubescentibus; foliis cuneato-lanceolatis obtusis; subtus lanuginosis ferrugineis nec sericeis calycibus glabris basi pilosiusculis.

BUMELIA lanuginosa. PERSEON, Synops. 1, p. 237. PURSH, Flor. 1, p. 155.

SIDEROXYLON LANUGINOSUM, spinosum; ramulis patentissimis, pubescentibus; foliis ovali-lanceolatis, supra glabris, subtus lanuginosis nec sericeis. MICH. Flor. Bor. Am. vol. 1, 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.

LARGE-FRUITED BUMELIA.

BUMELIA MACROCARPA, *depressa*, *ramis gracilibus valde spinosis, spinis elongatis tenuibus subrecurvis, foliis parvulis cuneato-lanceolatis obtusis junioribus lanuginosis, demum subglabris concoloribus; 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 grey 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.

†† *Leaves Sempervirent.*

NARROW-LEAVED BUMELIA.

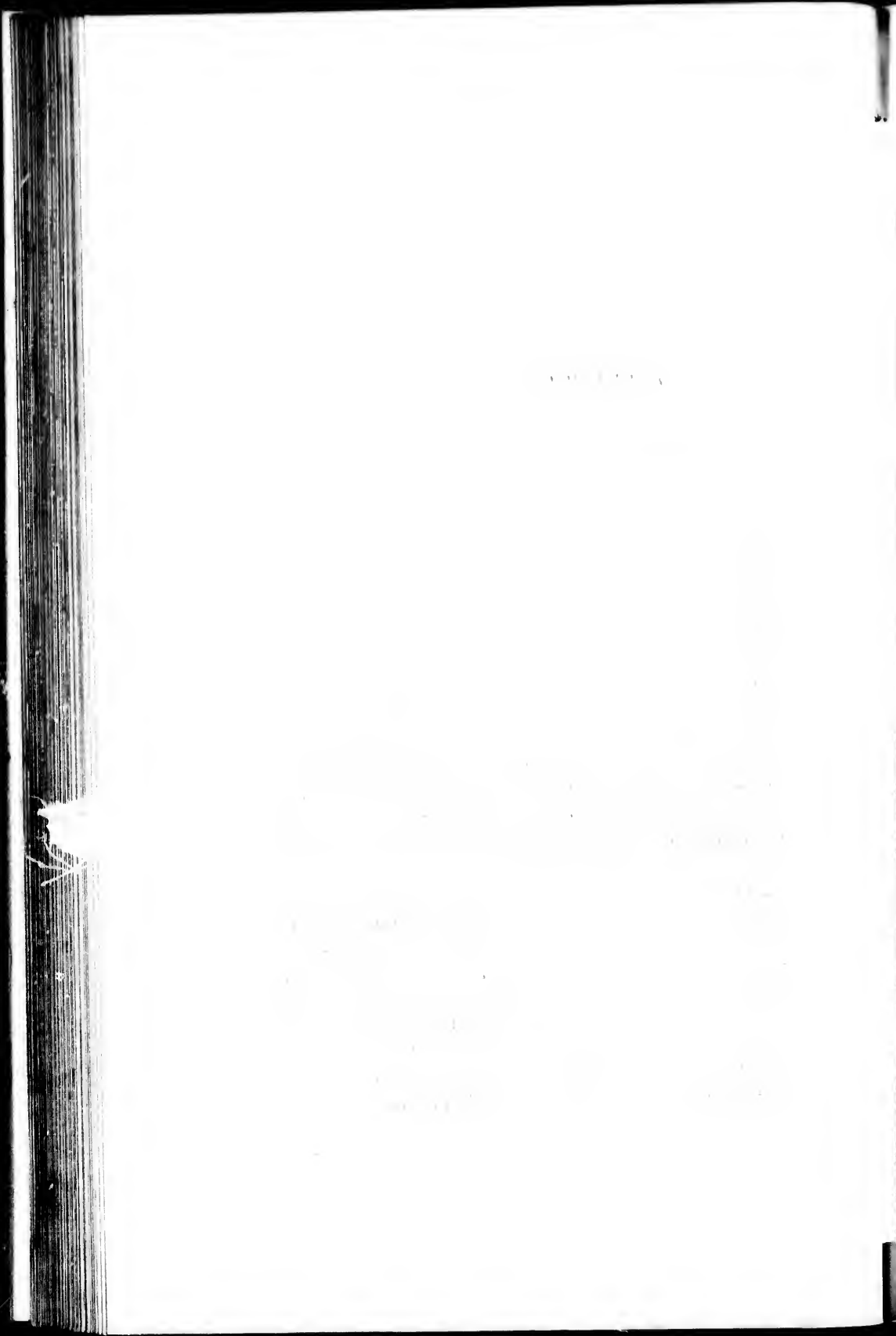
BUMELIA ANGUSTIFOLIA, *glabra spinosa, foliis lineari-oblongis obtusis, floribus aggregatis glabris, drupa oblonga umbilicata.*

THIS tree, according to Dr. Blodgett, is common at Key West, where it attains the height of 40 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 grey 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 3 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 bloom, oblong-elliptic, by abortion 1-seeded, the 3 or 4 other ovules stified, 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



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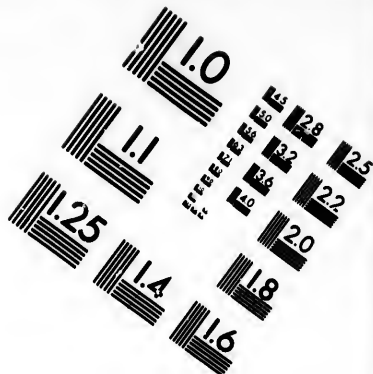
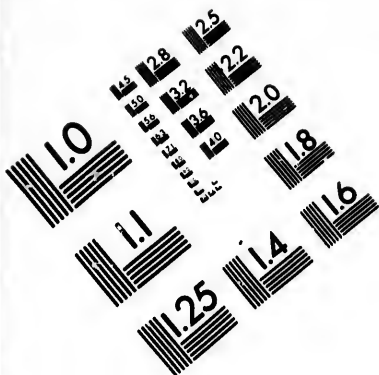


Bumelia *angustifolia*

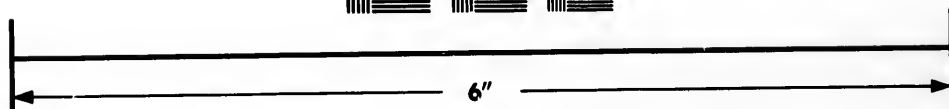
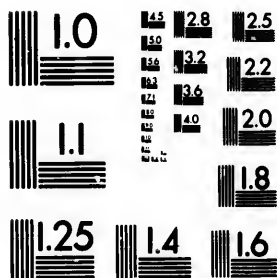
Bumelia angustifolia

de rotellier & feuilles striées





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



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Foetid Bumelia

Bumelia foetidissima.

Sapotillier très fétide

... with a ...

... *Sida* ...

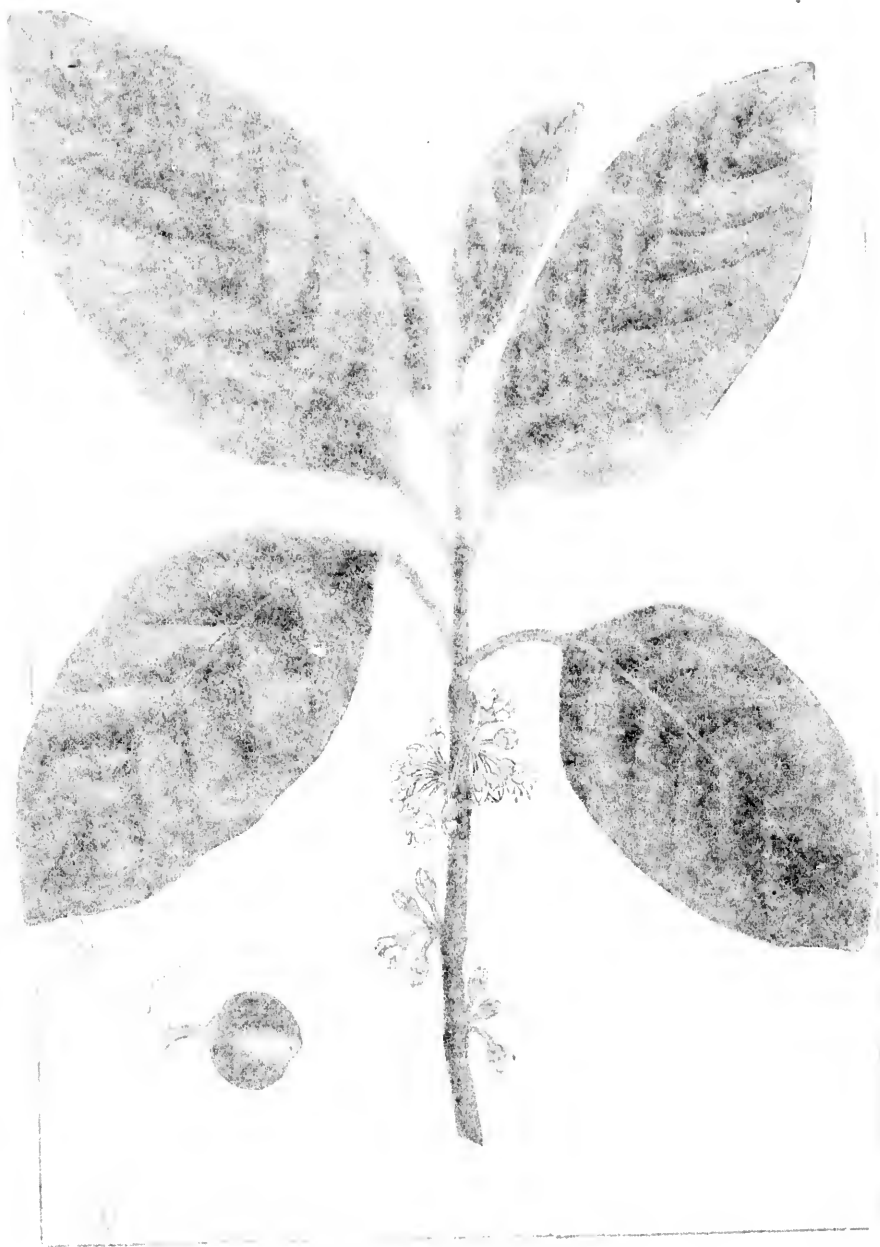
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PLANT ...

... *Sida* ...

This is another ... indigenous to ... and was found ... it was in flower in ... spiny nor milky-laced, and ... as large as a nut.

In this species the ... disposed chiefly at the ... they are nearly elliptic and ... on petioles nearly ... persistence, yet somewhat ...



Bumelia tomentosa

Sapotaceae

suture, 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 FÆTIDISSIMA, *foliis lanceolato-oblongis obtusis subemarginatis, pedunculis confertis axillaribus.* WILLD. Sp. Plant. vol. 2, p. 1086.

PERSOON, Synops. 1, p. 237.

SIDEROXYLON FÆTIDISSIMUM inerme, foliis sub-oppositis, floribus patentissimis. LINN. Mantis. p. 49. JACQ. Amer. p. 55. LAM. Dict. vol. 1, 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 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 3 to 3½ inches

long and from $1\frac{1}{2}$ to 2 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 5 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 1-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. 1, p. 246. It is also nearly allied, apparently, to *B. pallida*.

PLATE XCIV.

A branch of the natural size.

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STRAWBERRY TREE.

(ARBOUSIER, Fr.)

Natural Order, ERICEÆ, (R. BROWN.) *Tribe* ARBUTEÆ,
(Decand.) *Linnæan Classification*, DECANDRIA MONO-
GYNIA.

ARBUTUS.* (CAMER. TOURNEFORT.)

Calyx inferior, 5-parted. The *corolla* globosely or ovately campanulate; the narrow border 5-cleft and reflected. *Stamens* 10, included. *Anthers* compressed at the sides, opening by 2 terminal pores, attached below the summit where they produce 2 reflected awns. *Ovarium*, seated upon or half immersed in an hypogynous disc, 5-celled, cells many-seeded. *Style* 1: 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.

* An ancient name for the *Arbutus Unclo*.

MENZIES'S STRAWBERRY TREE.

ARBUTUS MENZIESII, arborea, foliis ellipticis acutis subserratis longe petiolatis glabris, racemis paniculatis densifloris axillaribus terminalibusque.

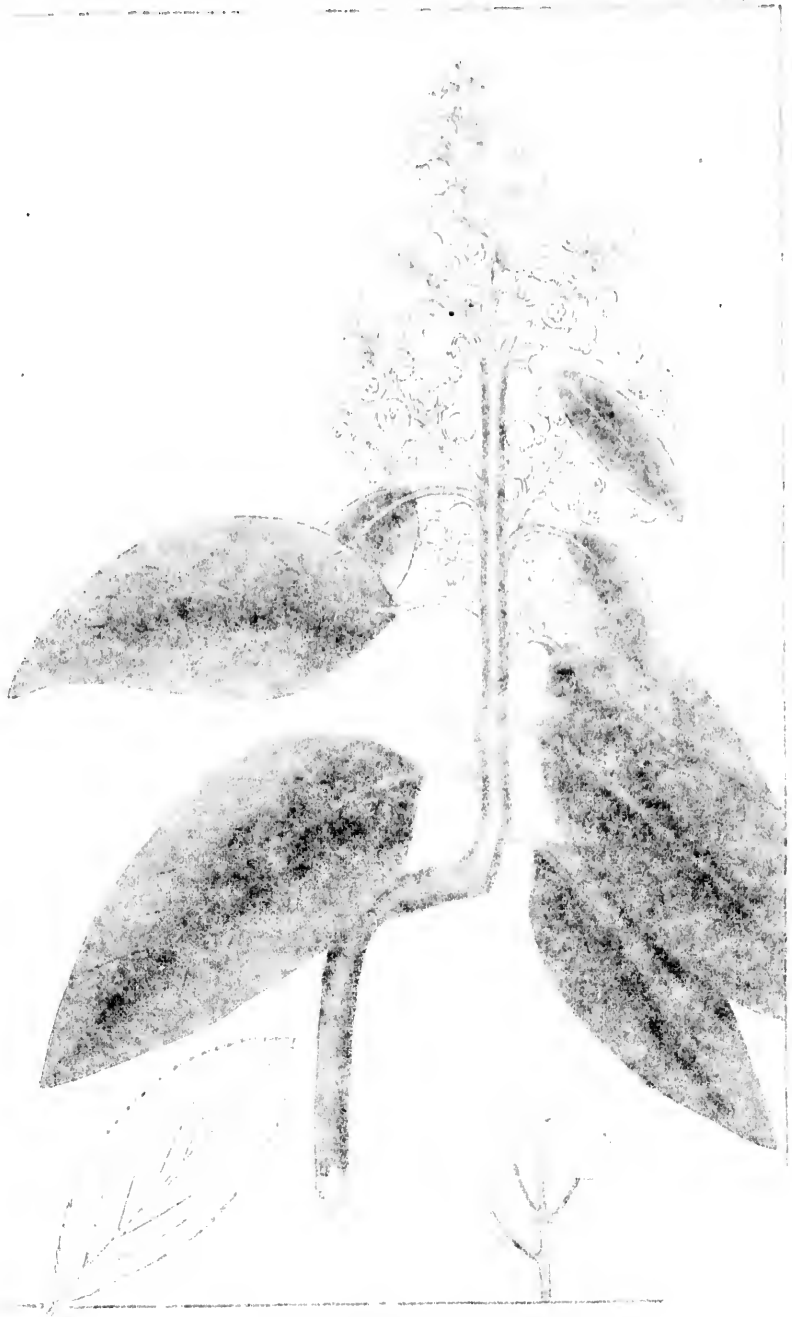
ARBUTUS menziesii. PURSH. Flor. Bor. Amer. 1, p. 282.

ARBUTUS laurifolia? LINN. Suppl. 238.

ARBUTUS procera. DOUGLAS, Bot. Reg. tab. 1573.

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 30 to 40 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 towards 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



Arbutus Menziesii

Strawberry Tree

Merzies

EXCISE-SMOKING BERRY TREE.

The tree is a small, bushy, upright shrub, 10 to 15 feet high, with a dense, rounded, spreading canopy. The leaves are alternate, ovate, 2 to 3 inches long, and 1 to 1.5 inches wide, with a serrated margin and a prominent midrib. The flowers are small, white, and arranged in dense, terminal clusters. The fruit is a small, round, red berry, which is eaten by the natives. The tree is found in the mountains of the island of Java, and is cultivated in some parts of the island for its fruit. The bark is thick and woody, and the wood is hard and heavy. The tree is a member of the family *Ericaceae*, and is closely related to the *Myrica* and *Calluna* genera. The tree is a very common and useful plant, and is found in many parts of the island of Java. The fruit is a very important food source for the natives, and is also used in the preparation of a local beverage. The tree is also used for its wood, which is used for the construction of houses and other buildings. The tree is a very beautiful and useful plant, and is a valuable member of the island's flora.

The species appears to be very close to *A. Auriculata*, of the Levant, and I suspect is not sufficiently distinct from *A. aurifolia* of Jamaica. In any case, there is but one *Calluna* sect. species in the genus in the



Mexican Strawberry Tree

Arbutus Menziesii

Arbousier de Menzies

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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 1 to 2 feet. The pulp of the fruit is somewhat aromatic, but wholly inedible. The cells only about 2-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.

TREE WHORTLEBERRY.

BATODENDRON ARBOREUM. NUTT. in Philos. Transact. Philad. vol. 8.

VACCINIUM arboreum. MARSHALL, p. 157. MICH. Flor. Amer. 1, p. 230.

PURSH. Flora, 1. p. 285. ELLIOTT, Sk. 1, p. 495.

VACCINIUM diffusum. AITON. Hort. Kew. vol. 2, 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 10 to 20 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 saw-dust, 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.

MOUNTAIN LAUREL, (*Rhododendron maximum*) "is found, as you know, at Medfield and at 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 *Hopea tinctoria*, *Laurus Borbonia*, and the *Quercus hemispherica*.

SORREL TREE, (*Andromeda arborea*). A tree of this species now growing at the Bartram Garden, is more than 60 feet high, with a circumference of 4 feet.

MELON OR PAPA W TREE.

(PAPAYER. Fr.)

Natural Order, PAPAYACEÆ. (Von Martius.) *Linnæan*
Classification, DIÆCIA DECANDRIA.

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

DIÆCIOUS or POLYGAMOUS.—*Calyx* inferior, minute and 5-toothed. *Corolla*, monopetalous, with a contorted aestivation, in the stamiferous flower tubular, with 5 lobes and 10 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 5 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

* 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.

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Papaw Tree

Papaya vulgaris

Bipayer Commun.



Fig. 1. Tree

Papave - de aris

Fig. 2. Fruit

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.

COMMON MELON OR PAPAWE TREE.

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

PAPAYA vulgaris. DECAND. in Lamarek's Dict. vol. 5, p. 2. Illust. t. 821.

CARICA Papaya. LINN. Sp. pl. WILLD. Sp. pl. 4, p. 814.

Carica fronde comosa, foliis peltatis; lobis varie sinuatis. BROWN, Jam. p. 360.

Papaya fructu melo-peponis effigie. PLUM. Catal. p. 20. TREW. Ehret. tab. 7? TOURN. Instit. p. 659.

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

Arbor melonifera. BOUTIUS, p. 96.

Arbor platani folio, fructu Peponis magnitudine eduli. BAUHIN Pinax, p. 131. MERIAN. Surinam, p. 40, tab. 40 and 62. 64.

THE Papaw Tree, rising erect into the air without branches to the height of 20 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 towards 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 3 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 towards the base. The leaves are on petioles which are near upon 2 feet long, they are deeply divided into 7 or 9 sinuated gashed lobes. The flowers are axillary, yellowish-white and fragrant; the barren ones in 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, singular 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 Malaguette 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 vapour alone is said to produce this effect upon meat suspended among

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

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 Brown 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.

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 6 or 8 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 15 or 20 feet, which is smooth and polished, of a bright ash colour. Its perfectly spherical top is formed of very large lobesinuate 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 scone candlestick. The ripe and green fruit are placed round about the stem or trunk, from the lowermost leaves, and upwards 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.

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Large-flowered Dogwood

Cornus Nuttallii.

Cornouiller de Nuttall.



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DOGWOOD.

(CORNOUILLER. Fr.)

Natural Order, CORNACEÆ, (Decand.) Linnæan Arrangement, TETRANDRIA MONOGYNIA.

CORNUS.* (TOURNEFORT.)

Border of the *calyx* 4-toothed, minute. *Petals* oblong, spreading. *Stamens* 4, longer than the corolla. *Style* somewhat club-shaped; stigma obtuse or capitate. *Drupe*s 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 coloured involucrem resembling petals. Hairs of the leaves and stems affixed by the centre.

LARGE-FLOWERED DOGWOOD.

CORNUS NUTTALLII, (Audubon), *arborescens; involucri 4-6-foliolatis, foliis obovatis, acutis acuminatisve basi angustatis; foliis ovalibus, viz acuminatis; cortice levi.*

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

CORNUS NUTTALLII, leaves of the involucre 4-6, obovate, acute or acuminate, narrowed at the base; drupes oval; leaves oval, scarcely acuminate. TORREY and GRAY, Flor. N. Amer. 1, p. 652. AUDUBON, Birds of America, plate 367.

CORNUS Florida, HOOKER, Flor. Bor. Amer. vol. 1, p. 277, (partly.)

ON arriving, towards the close of September in 1834, at Fort Vancouver, I hastened again on shore to examine the productions 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 50 to 70 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 coloured involucres nearly 6 inches in diameter! These appeared in all their splendour, 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 5 or 6 in number, of an obovate outline, with the points often acute. The leaves are about 4 inches long and $2\frac{1}{2}$ 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 umbrella*, and each of them is strongly terminated by the 4 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 favourite food of the Band-Tailed Pigeon. To the north this species prevails, probably as far as Fraser's river, or Sitcha, but we did not meet with it California, nor any where 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 Common 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.

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 grandiflora*. 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 12 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. 401.

WOOLLY-LEAVED CORNUS.

CORNUS PUBESCENS ramis purpurascens, ramulis cymisque hirsutis; foliis ovalibus acutis glabriusculis subtus pallidis hirsuto-pubescentibus, cymis depressis, dentibus calycinis minutis, petalis lanceolatis acutis. NUTT. in Torrey and Gray, 1, p. 652.

CORNUS circinata. CHAMIS. and SCHLECHT. in Linnæa. 3, p. 139.

CORNUS sericea, β. ? *occidentalis*: leaves larger, more tomentose beneath. TORR. and GRAY, vol. 1, 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 St. Francisco in Upper California. The stem is about 6 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 reclined 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.

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.

The CORNEL-CHERRY (*Cornus mascula*), 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.

FRINGE TREE.

(CHIONANTE, Fr.)

Natural Order, OLEINEÆ, (Hoffmansegg and Link.) *Lin-
næan 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* 2, sometimes 4, included and inserted into the tube. *Ovarium* bilocular; ovules pendulous and collateral, 2 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.

COMMON FRINGE TREE.

CHIONANTHUS VIRGINICA, *panicula terminali trifida; pedunculis trifloris; foliis acutis*. WILD. Sp. pl. 1, p. 46.
CHIONANTHUS, *pedunculis trifidis trifloris*. LINN. Hort. Cliff. p. 17.

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

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Salix purpurea

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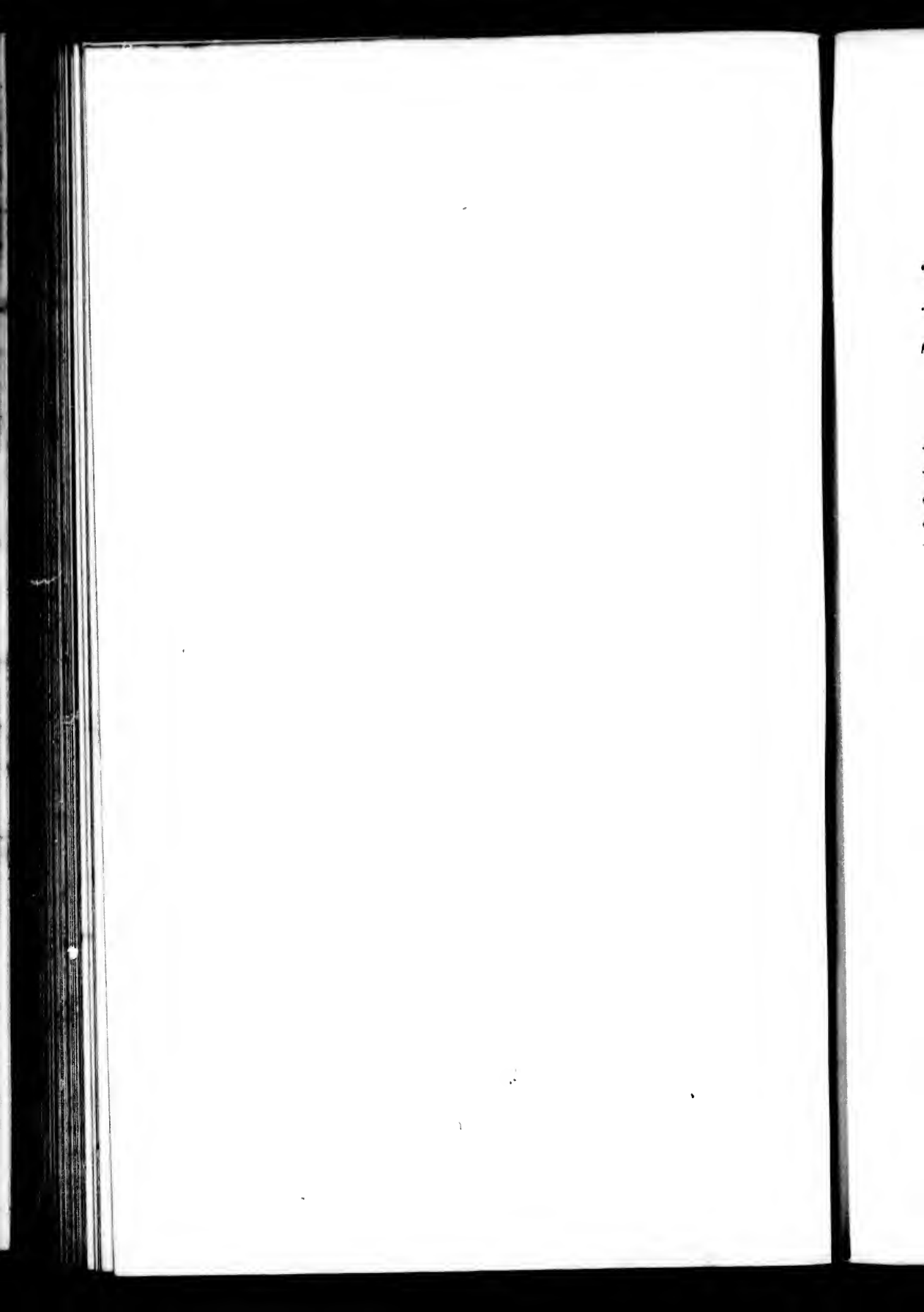




Fringe Tree

Chionanthus Virginia.

Chionanthus virginica



- DUHAMEL, Arb. 1, p. 165. Du Roi, Harbk. 1, p. 150. LAM. Dict. 1, p. 735.
- α. CHIONANTHUS (latifolia), *foliis ovato-ellipticis*. AIT. Kew. 1, p. 22.
C. maritima. PURSH. 1, p. 8.
Amelanchier virginiana, laurocerasi folio. PETIV. Sici. p. 241. CATESBY, Carol. vol. 1, p. 68, tab. 68.
- β. CHIONANTHUS (angustifolia) *foliis lanceolatis*, (narrow-leaved Fringe Tree.) AIT. Kew. 1, p. 22.

THIS beautiful tree attains the height of 12 to 20 feet, with a diameter of 10 to 12 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, amongst 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, senior; 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.

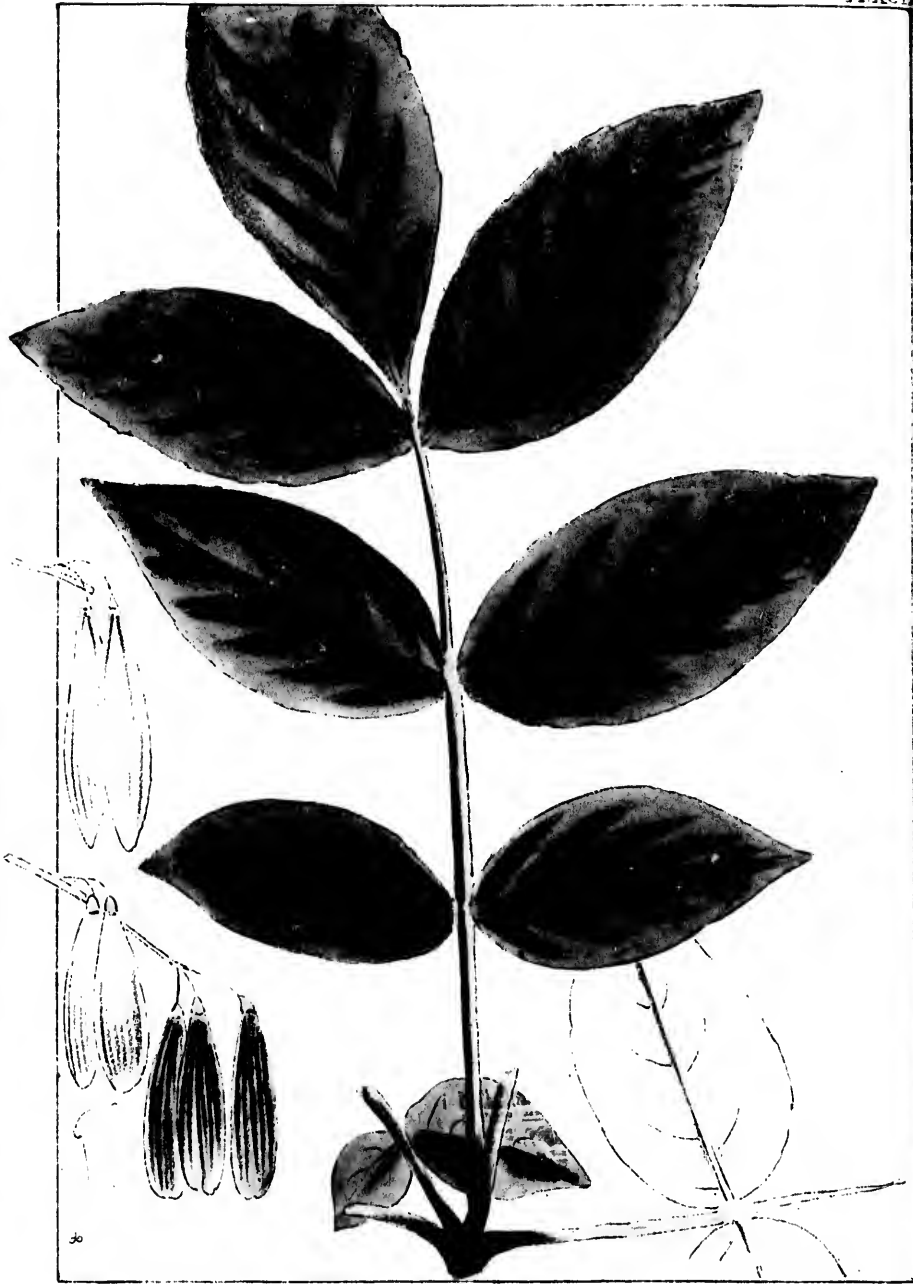
The tree presents a roundish spreading summit; the leaves are opposite, petiolate, oval, pointed at either end, entire; green and smooth above, pubescent beneath, 6 or 7 inches long by about 3 wide. The white flowers come out in pendent paniculated racemes, of which the extreme ramifications are usually 3-flowered. The fringe like petals are 8 or 9 lines long, sometimes with 6 divisions instead of 4, and as many as 4 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 32 inches in circumference, and about 20 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.

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Fraxinus Oregona

Oregon Black Ash

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ASH TREE.

(FRENE, Fr.)

*Natural Order, OLEINEÆ. Linnæan Classification, DIOECIA
DIANDRIA.*

FRAXINUS (LINN.)

MALE flowers with a minute 3 or 4-toothed calyx or that part wholly wanting. *Corolla* none; *stamens* 2 to 4. *Pistillate flowers* equally imperfect. *Ovary* superior, ovate, compressed, 2-celled, the cells each with 2 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.

OREGON BLACK ASH.

FRAXINUS OREGONA, *foliis subseptenis sessilibus, ovato-lanceolatis acutis subserratis integrisve cum rachibus petiolisque pubescentibus concoloribus, floribus caliculatis, samuris brevibus cuneatis emarginatis basi angustatis.*

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

THIS is the only species of Ash we met with in the Oregon territory. It becomes a large and useful tree 70 or 80 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.

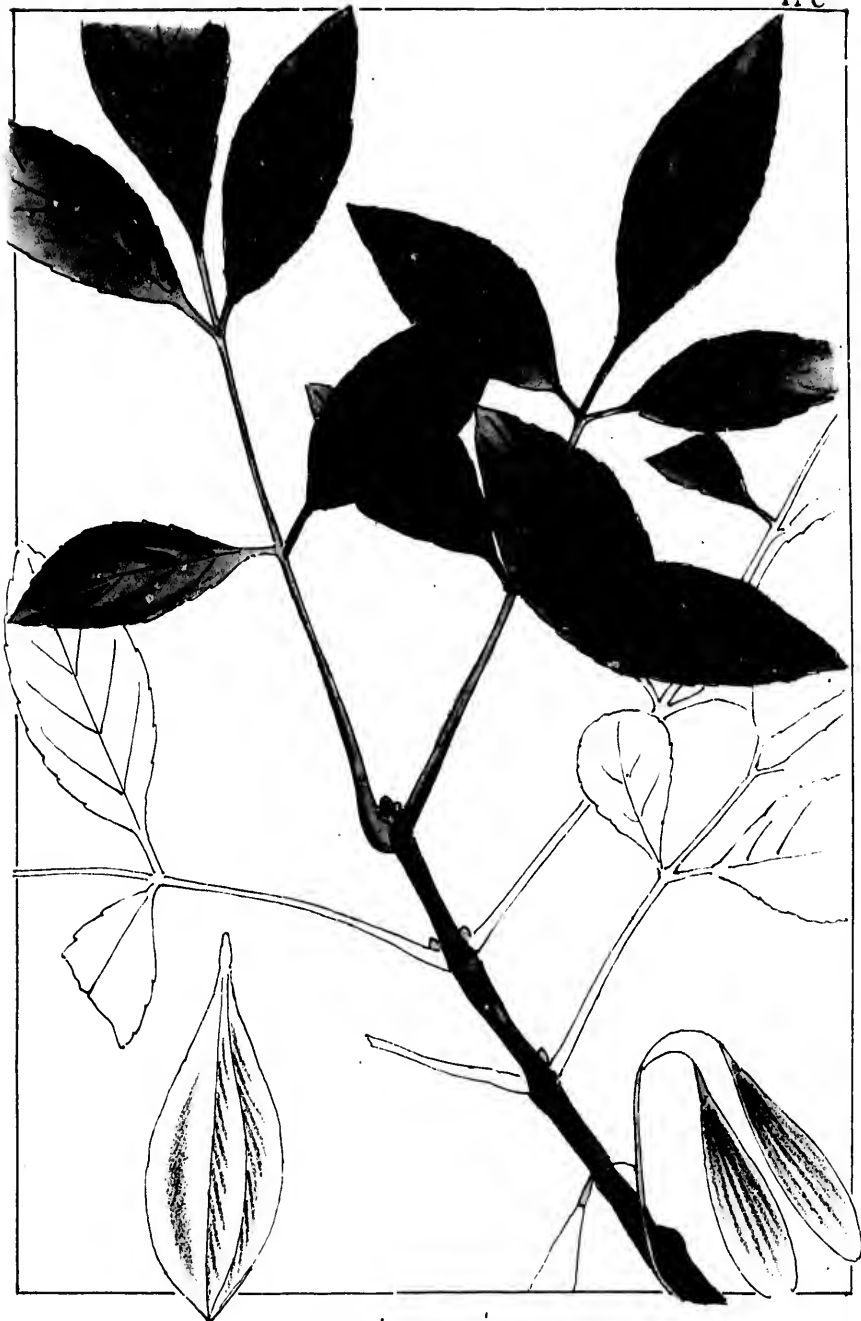
The leaves are 8 to 10 inches in length; the lateral leaflets, about 3 pair, are $2\frac{1}{2}$ to 3 inches long, the terminal leaf about 4 inches, the breadth about $1\frac{1}{2}$ inches, they are ovate-lanceolate, acute, but scarcely acuminate, sessile, entire, or now and then slightly serrate, on both surfaces pubescent, but particularly beneath as well as the midrib, and nearly of the same colour on both sides.

The male flowers are thickly clustered, the flowers with 2 or 3, 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 2 revolute stigmas; no corolla. The germ subquadrangular, ancipital, 2-celled; cells each with 2 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 3 inches. In our variety β . 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 amongst 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

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Small leaved Ash

Fraxinus Pauciflora.

Frêne à petites fleurs

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petites fleurs

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An opinion prevails in the country, among the Indians, that...

PLANT

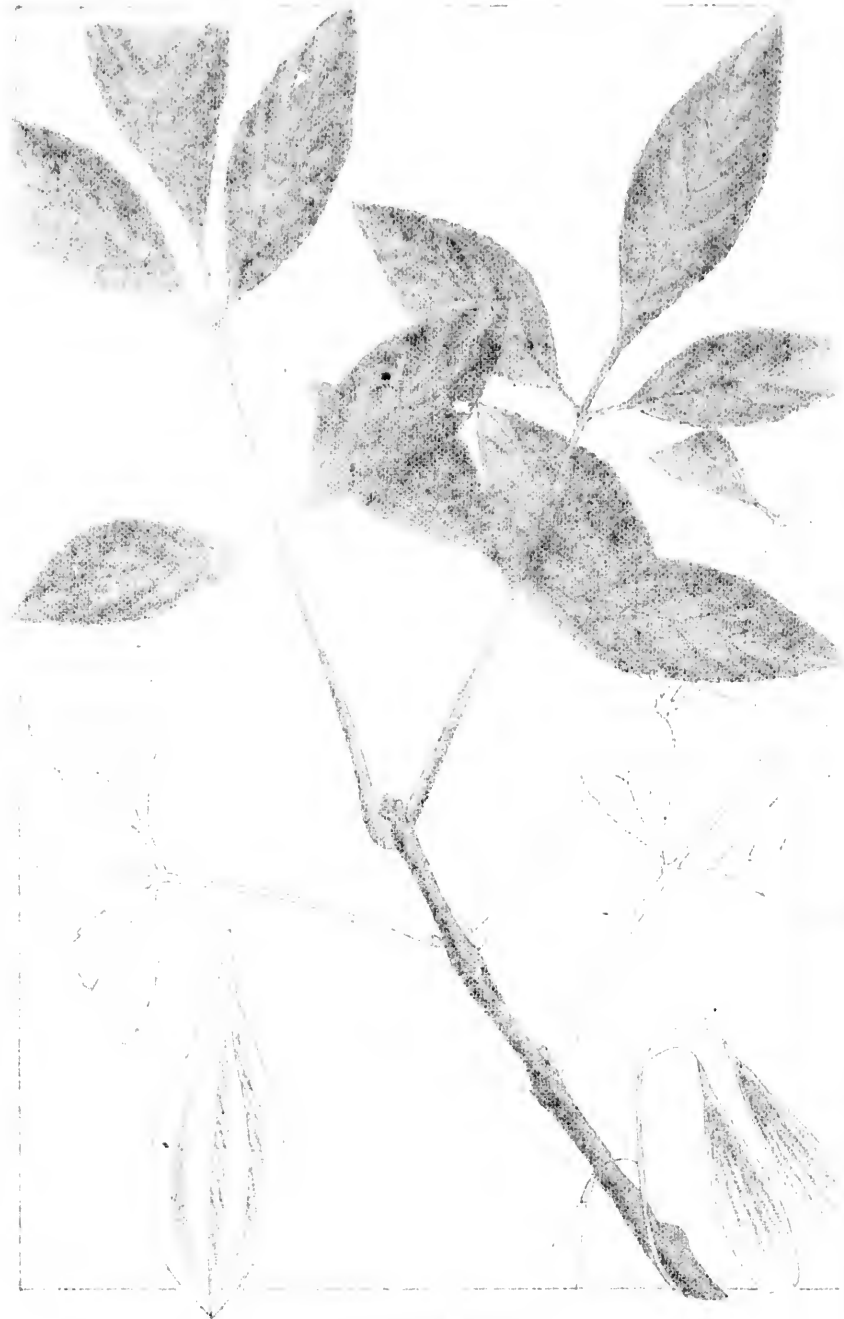
is a small tree, 10 to 15 ft. tall. It has a...

PLANT

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This remarkable species is...

The character of the...



Fraxinus pennsylvanica

Fraxinus Pennsylvanica

Fraxinus pennsylvanica

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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 Rattle Snake 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, foliis quinis ad septenis lanceolatis remotis longe petiolatis utrinque acuminatis leviter serratis glaberrimis, racemis fructiferis simplicibus, paucifloris.

THIS remarkable species of Ash was collected in Georgia, in the neighbourhood of "Trader's Hill" by the late indefatigable and excellent botanist Doctor Baldwyn. 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

is 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 5 to 7 lanceolate leaflets, which are 2 to 2½ inches long by about ¾ of an inch wide, acuminate 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 mid-rib, 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 2 or 3 remote pairs of racemes, each being quite simple or unbranched, terete, and producing only 2 or 3 samaras or capsules in place of the usual trichotomous and compound cluster.

The samara is about 1½ 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.

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THREE-WINGED ASH.

FRAXINUS TRIPTERA, *samarc. latissima obovato-cliptica, plerisque trilata, basi angustissima, ecaliculata; foliolis.* . . NUTT. vol. 2, 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 3-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 3-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 neighbourhood, which was 104 feet high, 32 inches in diameter, and its age by the concentric circles was 232 years. The diameter under the bark was 30 inches. Another growing near to it was about 36 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 colour 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 distills 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 colour, which, however, purges more than the preceding.

Several species of Ash afford manna as well as the *Ornus*.

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.

WHITE ASH, (*Fraxinus acuminata*. Lamarck. *F. americana*. Willd. *F. epiptera*. Mich. Flor. Bor. Am. 2, p. 256.) This tree grows from 50 to 70 feet high, and sometimes 2 to 3 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. 2, p. 256.) Mr. Elliott remarks, "I think it
sometimes becomes a large tree."

FLOWERING ASH.

(FRENE A FLEUR, Fr.)

Natural Order, OLEINEÆ. *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, anthera elongata, filamentis brevibus.*

ORNUS DIPETALA. *Hooker and Arnott, in Botan. Beech. tab. 87.*

FRAXINUS (*ornus*) DIPETALA; *foliis 3-jugis, foliolis ovalibus obtusis acute serratis glabris basi cuneatis, inferioribus in petiolulum longiusculum attenuatis, superioribus duobus sessilibus, supremo longe petiolulata,*



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Ornus Dipetala.

Californian Flowering Ash.

Le Fresno à Fleurs de Californie.

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paniculis multifloris longitudine fere foliorum ac infra folio ortis, petalis 2 obovato-oblongis obtusis unguiculatis. Hook. in Bot. Beechy, Suppl. p. 362.

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 axills of the leaves; they have a distinct 4-toothed calyx, and 2 oblong, obtuse spreading petals about the length of the stamens. The stamens do not appear to be exerted 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 above. The author remarks, that it is allied to *F. Schiedianus* of Schlechtendal, described in the Linnæa. vol. 6, 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. Amer. vol. 1, 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, ½ 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 purposes of profit.

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 Sta. 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.

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ARDISIA.*

(SWARTZ.)

Natural Order MYRSINÆ. (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 aveniis, calycibus abbreviatis, caule arboreo.*

CYRILLA *paniculata.* NUTT. in Silliman's Journ. Sci. vol. 5, p. 290.

PICKERINGIA *paniculata.* IBID. Journ. Acad. Nat. Sci. Philad. vol. 7, p. 95.

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

VOL. III.—10

THIS beautiful evergreen tree, according to Dr. Blodgett, is very common at Key West, where it attains an elevation of 20 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 towards the extremities of the branches, which are covered with a dark-brown bark, they are 3 to 4 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 5 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 colour 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.

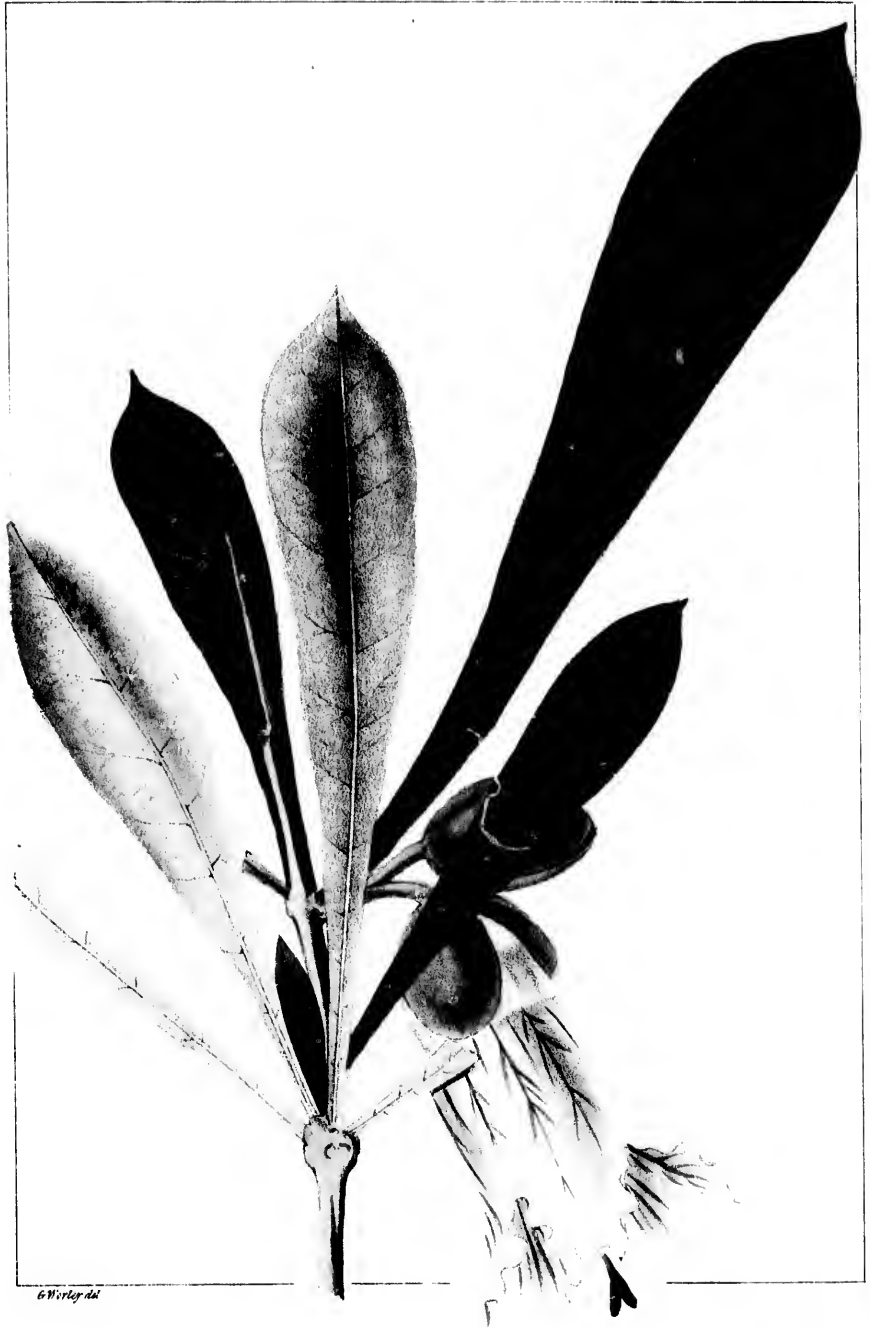
A branch of the natural size. a. The flower somewhat enlarged.

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Long leaved Calabash Tree

Crescescentia Cujete.

Calabassier Cujete



CALABASSUR

ANGIOSPERMIA

Natural Order: *BOULANGERIACEAE* - *Indo-austral Chrysobalanaceae*. *DYDYMAMIA* ANGIOSPERMIA.

CRESCENTIA? (*Calabassur*)

tree 2-petals, no oil and resin

in the tropics

with its segments

in the tropics

in the tropics

in solid bark

one or shreds of tree

large, alternate and base

in trunk of branches

LONG-LEAVED CALABASSUR

CRESCENTIA (*Calabassur*) *Calabassur* (*Calabassur*)

Named in memory of Peter Calabassur (1811-1880)



1892

Herbarium of the University of California

Passiflora ligularis Choisy

1892

CALABASH TREE.

(CALABASSIER. Fr.)

*Natural Order, SOLANÆE. Linnæan Classification, DIDY-
NAMIA ANGIOSPERMIA.*

CRESCENTIA.* (LINN.)

Calyx 2-parted, equal and deciduous. *Corolla* large, somewhat campanulate, the tube unequal, ventricose and incurved, the border 5-cleft, unequal, its segments dentately-sinuate or torn. *Stamens* 4, (sometimes 5), as long as the corolla, 2 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.

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

- Obs. p. 234. LINN. Sp. pl. WILLD. vol. 5, p. 311. LAEFLING's Iter. p. 225. JACQ. Amer. p. 175. t. 111.
- C. arborecens, foliis confertis obovato-oblongis basi angustioribus, fructu spherico maximo.* BROWNE, Jam. p. 265.
- CUJETE foliis oblongis et angustis, magno fructu ovato.* PLUMIER, Gen. 23, ic. 109. PIGO, Brazil, p. 173.
- Arbor americana cucurbitifera, folio longo mucronato, fructu oblongo.* COMMEL. Hort. Amst. vol. 1, p. 137, t. 71.

THIS species attains the ordinary height of a pear tree, being 20 to 25 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 2 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 head-aches. 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, coloured 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 9 or 10 together at unequal distances, and are from 5 to 7 inches long, and about an inch broad, narrowing very gradually towards 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 $1\frac{1}{2}$ inches long, marked with brownish streaks or veins, solitary and of a disagreeable smell; the tube is almost globosely ventricose, with the border 5-cleft, each of the divisions trifid, in long filiformly acuminate 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.)

Natural Order, BIGNONIACEÆ, (R. BROWN.) *Linnæan Classification*, DIDYNAMIA ANGIOSPERMIA.

TECOMA.* (JUSSIEU.)

Calyx campanulate, 5-toothed. *Corolla* with a short tube, towards the orifice campanulate, the border 5-lobed, unequal or bilabiate. *Stamina* 4, didynamous, with the rudiment of a 5th. *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.

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

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Common Trumpet Flower

Tecoma radicans.

Bianche de Virginie

COMINO (EUPHORBIA) FLOWERS

The flowers are small and numerous,
 and are borne in a terminal panicle.
 They are of a pale yellow color,
 and are very fragrant.
 The leaves are small and
 are arranged in opposite pairs
 along the stem.
 The plant is a
 perennial herb,
 and is native to
 the island of Comino.
 It is a member of the
 Euphorbia family.
 The flowers are
 very attractive
 and are a
 beautiful sight.
 They are
 very fragrant
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The flowers are
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COMMON TRUMPET FLOWER.

TECOMA RADICANS, *foliis pinnatis; foliolis ovalibus dentatis acuminatis; corymbo terminali; tubo corollae calyce triplo longiore, et ule geniculis radicatis.*

TECOMA RADICANS. JUSSIEU, *Genera Plant.* p. 155.

BIGNONIA RADICANS. LINN. *Hort. Cliff.* p. 317. WILLD. *Sp. pl.* vol. 3, p. 301. WALTER, p. 169. MICH. *Flor. Bor. Amer.* vol. 2, p. 25.

PURSH. *Flor.* 2, p. 420. ELLIOTT, *Sk.* 2, p. 108. CURT. *Magaz.* 485. NOUV. DUHAMEL, vol. 2, 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. 1, p. 65, tab. 65.

BIGNONIA americana, fraxini folio, flore amplo phaniceo. TOURNEFORT, p. 164.

Gelsemium hederaceum Indicum. CORNUT. *Canad.* p. 102, tab. 103.

Pseudo-Apocynum hederaceum americanum, tubuloso flore phaniceo, fraxini folio. MORRIS, *Hist.* 3, p. 612, f. 15, tab. 3, f. 1.

Gelsemium clematidis, &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 radicans fibres of the stem it clings to trees and walls, ascending to the height of 30 to 50 or 60 feet. In favourable situations the main stem thickens and takes an independent stand, so as sometimes to produce a woody trunk 20 feet high and 3 feet in circumference, with a deeply furrowed grey bark. About mid-summer 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 3 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 no where 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 4 or 5 pairs of leaflets, these are oval, long pointed, serrated and acuminate, 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 cylindrical, are about 6 to 7 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 upwards of 60 feet high.

PLATE CIV.

A branch of the natural size.

CATALPA, (*Catalpa syringæfolia*, Sims. Bot. Mag. t. 1094. *Bignonia Catalpa*, MICH. Sylva, vol. 1, t. 64.) In a journey which I made into Georgia, Alabama, and West Florida in 1830, at Columbus in Georgia, on the banks of the Chatahootshee, 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, greyish-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 *Gelsemium*, is said to be poisonous.

A V I C E N N I A.

(AVICENNE. Fr.)

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* 4, 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 1 cell, with 2 valves. *Seed* one, large, without albumen, taking the form of the capsule, the cotyledones 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 3 species chiefly indigenous to New Zealand, tropical India and America.

* So named after the famous Oriental physician Avicenna.

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Avicennia tomentosa.

Soft-leaved Avicennia

Avicenne Colonnes



Swida frutescens

SOFT-LEAVED AVICENNIA.

- AVICENNIA TOMENTOSA, (*Jacquin*), *foliis oblongis obtusis subtus tomentosis*. WILLD. Sp. pl. 5, p. 395. JACQ. Amer. t. 112. PALIS. BEAUV. Flor. t. 47. BROWN, Prod. p. 518.
- BONTIA *foliis integris oblongis oppositis, petiolis crassis brevissimis subamplexantibus, floribus racemosis*. BROWN, Jamaica, p. 263.
- HALODENDRUM. *Thouar's Gen. Madagasc. No. 26.*
- MANGLE *laurocerasi foliis, flore albo tetrapetalo*. SLOANE, Jam. p. 156. Hist. 2, p. 66. RAJ. Dendr. p. 115.
- ANACARDIUM. *Bauhin*, Pinax, p. 511. OEPATA. *Rheed*, Malab. vol. 4, p. 95, tab. 45. SCEURA, Forsk. Ægypt, p. 37.
- MANGIUM *album*. RUMPH. Amboin. vol. 3, 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 70 feet, with a trunk of 16 feet in circumference, sustaining a pyramidal and somewhat orbicular summit of dense and dark verdure. The wood is whitish, covered with a grey 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 3 inches long, and from an inch to an inch and a half wide. The flowers are rather small and whitish, with an agreeable odour, and disposed

at the summit and axils of the branches in panicles or short racemes which grow often 3 together, the divisions of the panicle, as in the branches, are opposite, the peduncles 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 groupes 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 coloured 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.

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Cordia Sebestena

Rough leaved Cordia.

Sebestier domestique.

Pl. CVL.

INDEX

Callispermum ...
Leontodon ...

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Strophocarpus ...
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C O R D I A.* (PLUMIER, LINN.)

(SEBESTIER. Fr.)

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* 5 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.

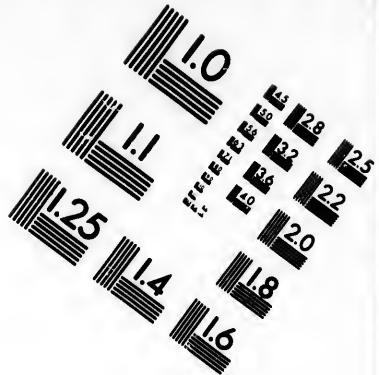
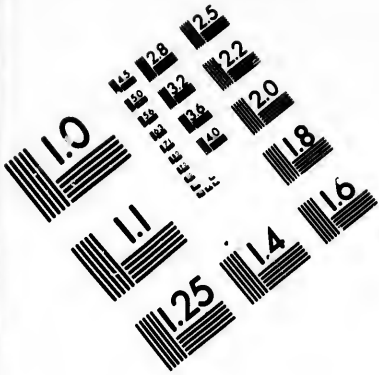
These are trees or shrubs chiefly of inter-tropical India and America, with alternate leaves, the flowers disposed in axillary or terminal corymbs or panicles and subject to vary in the number of their parts.

ROUGH-LEAVED CORDIA.

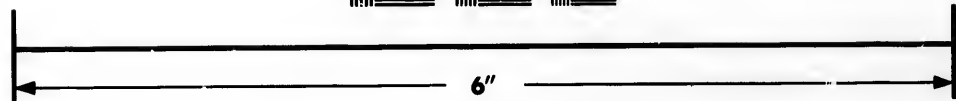
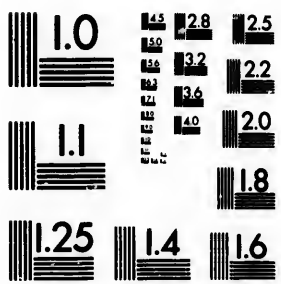
CORDIA SEBESTENA, *foliis oblongo-ovatis repandis scabris.* HASSELLQUIST, *Iter.* p. 458. MILLER, *Dict.* No. 1. WILLD. *Sp. pl.* vol. 2, p. 1073. PLUM. *Gen.* p. 13, ic. 105. LAM. *Illust.* tab. 96, fig. 1. *Botan. Magaz.* t. 794. *Botan. Repos.* tab. 157.

*Named by Plumier in honour of Euricius Cordus and his son Valerius, two German botanists of the 16th century. Sebestena is from the Persian name *Sebestan*.





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CORDIA foliis amplioribus hirtis; tubo floris subaequali. BROWN, Jamaica. p. 202.

SEBESTENA scabra, flore miniato crispa. DILLEN, Hort. Eltham, p. 341, tab. 255, f. 331.

Caryophyllus spurius inodorus, folio subrotundo scabro, flore racemoso hexapetaloides coccineo. SLOANE, Jam. 136. Hist. vol. 2, p. 20, tab. 164. RAI, Suppl. p. 86. CATESBY, Carol. vol. 2, p. 91, t. 91.

Novella nigra. RUMPH. Amboina, vol. 2, 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 favourite 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 5 or 6 oval, obtuse, waved and crenulated divisions. The stamens are 5; 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. Brown

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Cordia Floridaana.

Florida Cordia

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Cordia Florida.

Flora Florida.

Illustration of Florida.

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 colour with which the 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.

FLORIDA CORDIA.

CORDIA FLORIDANA, *foliis oblongis obovatis 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 20 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 5-cleft acute border, nearly smooth externally, and villous within. The tube of the corolla extends beyond the calyx, the border is 5-lobed, with obtuse, broadish segments; the stamens 5, 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 4 cells and 4 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 4 seeds.

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.

THE YEW.

(Fr. Fr.)

Natural Order, TAXINEÆ. (Richard.) *Linnaean Classification*, DIOECIA MONADELPHIA.

TAXUS.* (TOURN. LINN.)

DIOECIOUS.—*Male flower* composed of imbricated bud scales, connate at base. *Staminiferous* column exserted, the *stamens* 6 to 14, 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: cotyledones 2, 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 vernalion 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.

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

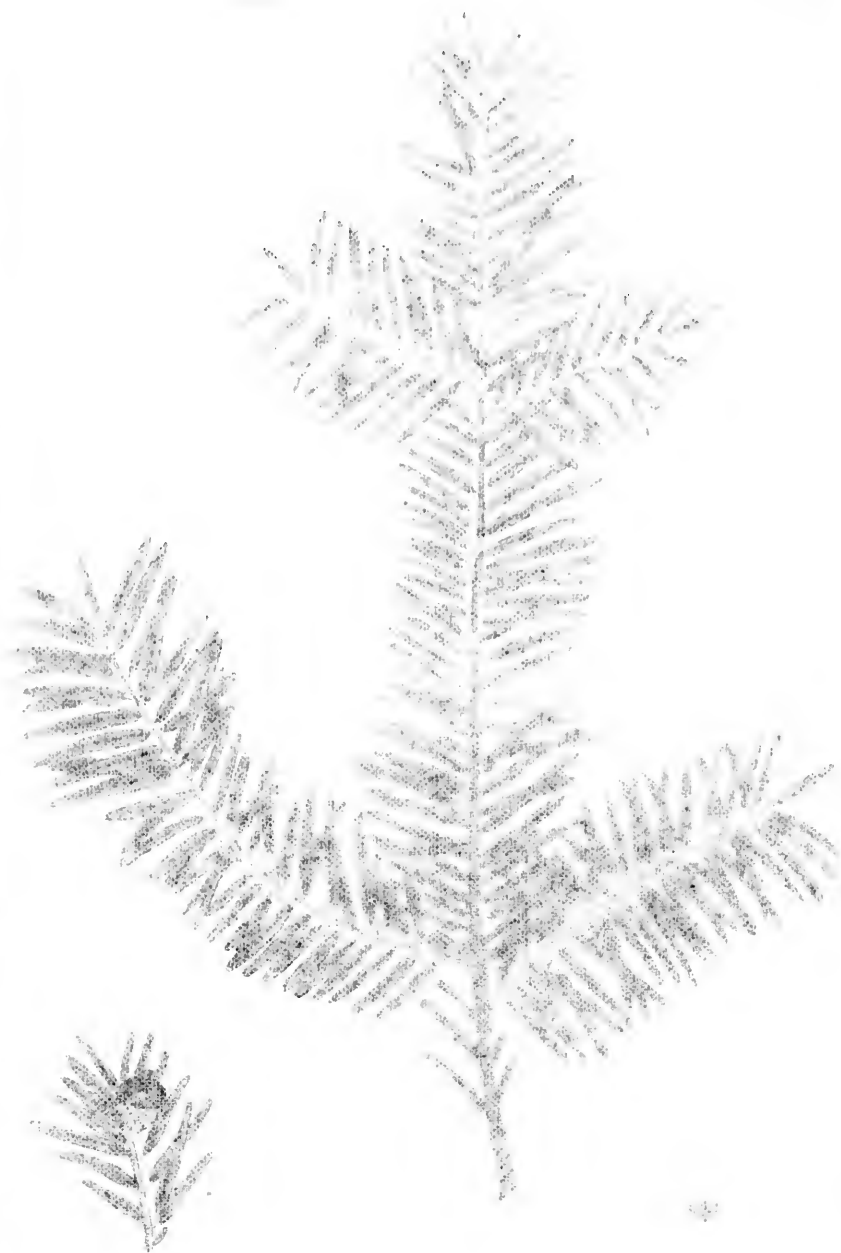
WESTERN YEW.

TAXUS BREVIFOLIA, *foliis linearibus brevibus planiusculis abrupte mucronulatis distichis, receptaculis masculis subglobosis, antheris minoribus.* **TAXUS BACCATA**, *Hooker*, in part *Flor. Bor. Amer.* 2, p. 167.

THIS species of Yew, so much like that of Europe, occupies a distinguished place in the dense maritime forests of the Oregon, and probably extends to the north as far as Nootka, being hardy like its European prototype, but inclined to grow taller, and more slender. Its usual height is from 40 to 60 feet, and we observed no trees of more than about 2 to 3 feet in diameter. The wood has the same close, and almost invisible grain, as that of Europe, of a beautiful white colour, 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 3 pairs instead of 5. The stamens are 9 to 11, with the anthers only about half the magnitude of these of the Common Yew. The nut, as usual, is seated in the bottom of a translucent red succulent cup. The leaves are from 5 to 7-tenths of an inch long.

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Taxus procumbens L.



Taxus occidentalis.

Western Yew:

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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 colour, 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 500 years. The sap-wood though of as pure a white as that of the Holly, is easily died of a jet black, when it puts on the appearance of ebony. A single tree is sometimes worth £100. 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 other wood in Europe, a cubic foot weighing 61 pounds 7 ounces French weight.

The Yews for their use, no less than their sombre grandeur and funereal aspect, were planted in all the old churchyards. According to the ancient poets the Styx and Acheron were overshadowed by its 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 representing 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, 20 inches in diameter, 280 annual layers, and Mr. Pennant mentions a Yew in Fortingal church-yard, in the Highlands of Scotland, whose ruins measured $56\frac{1}{2}$ feet in circumference, and 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 25 to 40 feet.

In 20 years it will attain the height of 15 feet, and it will continue growing for 100 years, after which it becomes comparatively stationary, but will live for many centuries. According to Loudon the largest tree of this kind in England is in Harlington church-yard, near Hounslow, which is 58 feet high, with a trunk of 9 feet, and a head of 50 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 26 feet 6 inches in circumference at 3 feet from

the ground. The Aukerwyke Yew, near Staines, is supposed to be upwards of 1000 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.*

(ARNOTT.)

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

DIOECIOUS.—*Male* ament subglobose, at length elongated. Scales stamiferous, 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 disc. *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* ruminant. *Embryo* subcylindric and short; cotyledones connate.

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

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

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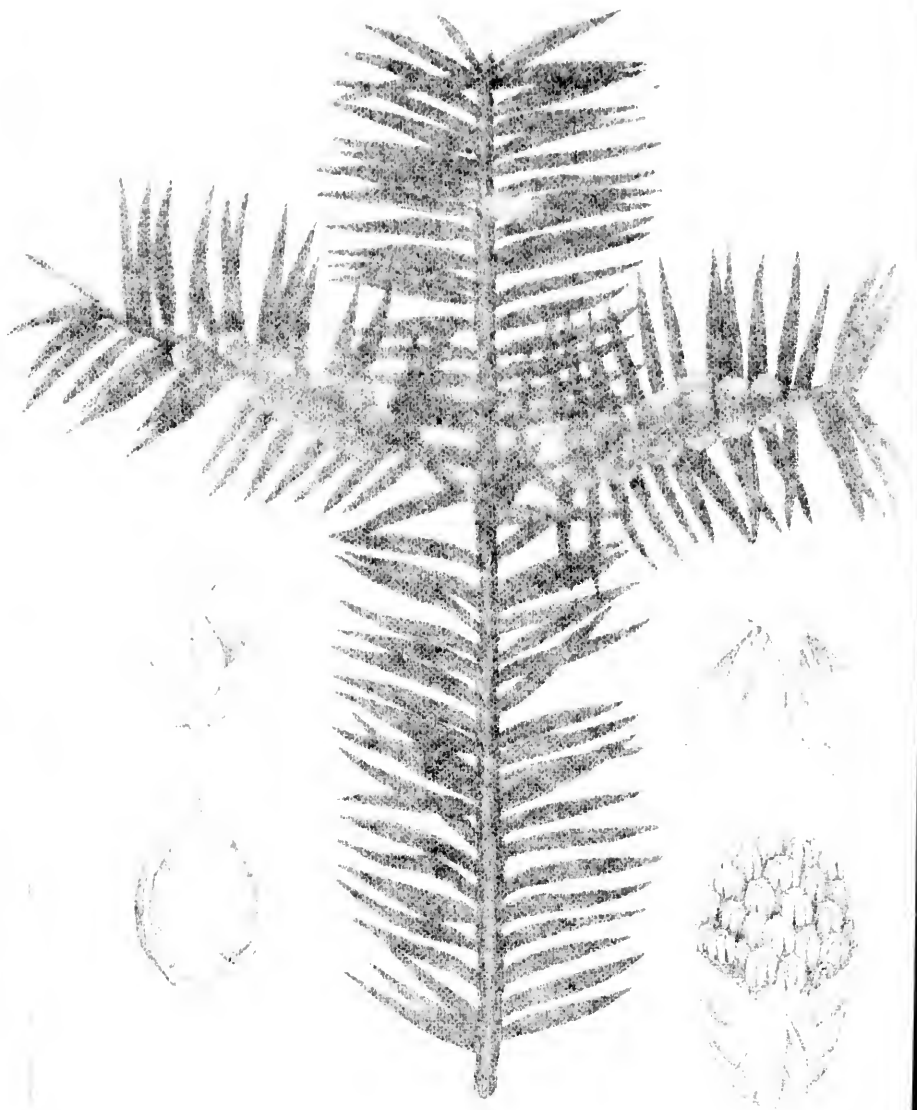
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W. H. Burser sculp.

Torreya Taxifolia *Torreya à feuilles d'II*
Yew Laurel Torreya.



Taxodium taxodium (Mill.) B.S.P. *Taxodium* *Taxodium* *Taxodium*

YEW-LEAVED TORREYA.

TORREYA TAXIFOLIA. *Arnott*, in *Hook.* Icon. Plant. Ined. vol. 3, part 5, tab. 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 Tallahassee, 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 6 to 18 inches in diameter, and from 20 to 40 feet high, with numerous spreading branches, the branchlets dividing into threes: 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 colour, 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 colour, like that of the Red Cedar (*Juniperus virginiana*): It has a strong and peculiar odour, 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 odour.

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 carnosose 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 Apalache 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 30 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 Acad. Nat. Sc. of Philadelphia, is marked *Taxus *floridana*. This species, from what I have seen, is scarcely distinct from our *T. brevifolia*, but 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.

TAXUS NUCIFERA of Thunberg and Kämpfer 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.

VOL. III.—13

Male
female
germi-

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from

JUNIPER.

(LE GENEVRIER. Fr.)

Natural Order, CUPRESSINÆ. (Richard.) *Linnaean Classification*, DIOECIA MONADELPHIA.

JUNIPERUS.* (LINN.)

Flowers mostly DIOECIOUS.—MALE ament globose, small. *Stamens* many, naked, inserted around a common axis; filaments excentrically peltate, imbricate, cells of the anthers 3 to 6. FEMALE aments axillary, ovate, the base surrounded with imbricate bractes. Scales of the involucrem 3 to 6, united at the base, with 1 to 3 ovules. *Fruit* drupaceous, scaly at base, the involucrem becoming a berry, umbilicate at the apex, and with bony seeds. *Seeds* 1 to 3, erect, subtriquetrous. *Embryo* inverted, situated in the axis of a fleshy albumen. *Cotyledones* 2, oblong, radicle cylindric, superior.

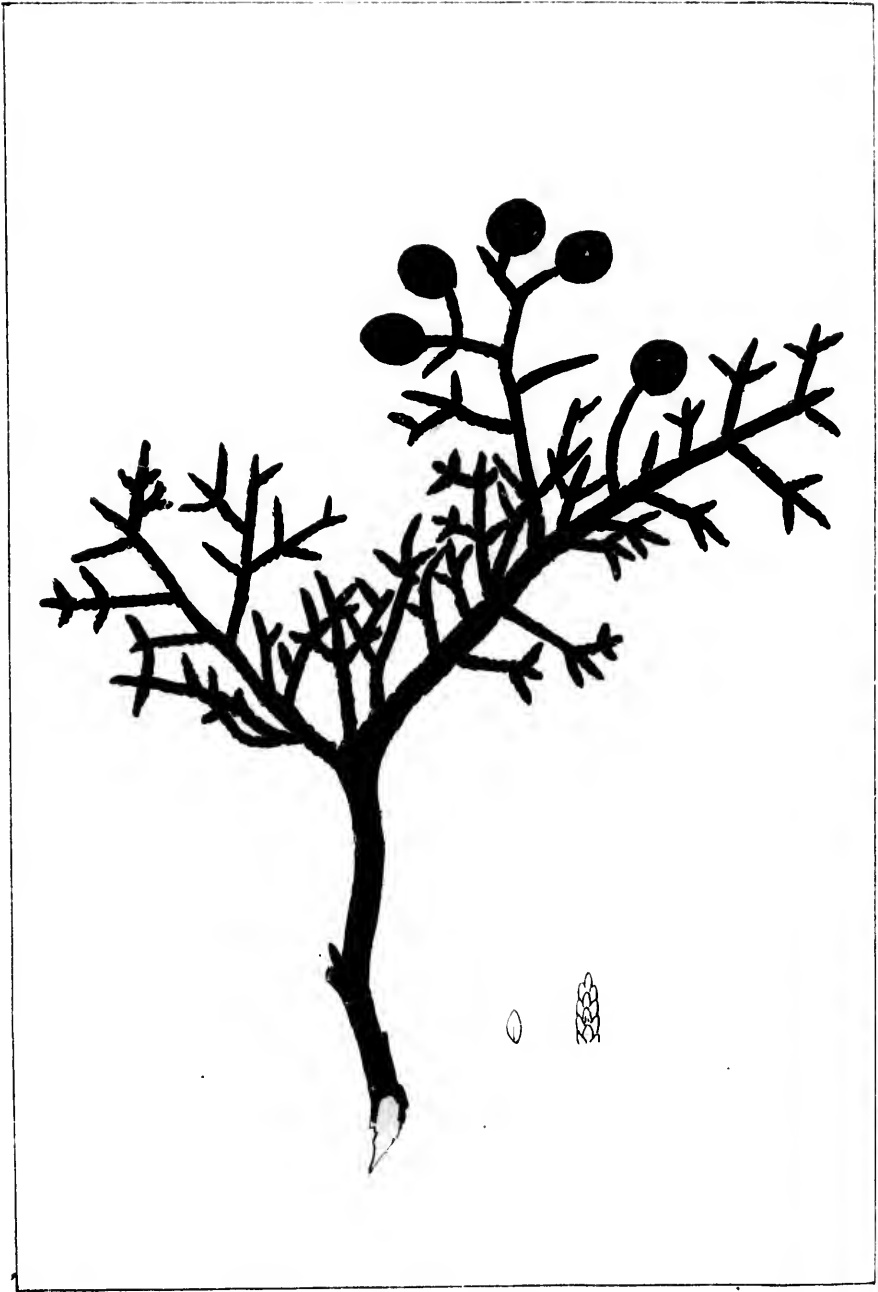
Large or small trees inhabiting the mountainous regions of the ancient continent, more rare in North America; the branches erect or pendulous, leaves imbricated, mostly minute, rigid, and sempervirent, resembling scales, of a linear-lanceolate form; the buds naked.

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

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Juniperus Andina.

Rocky Mountain Juniper

Genévrier des Andes



ROCKY MOUNTAINS

NEAR THE MOUNTAINS OF THE ROCKY MOUNTAINS
IN THE STATE OF MONTANA
IN THE YEAR 1846

The present page of the Rocky Mountains of Northern
Idaho and adjoining Lewis's River of the Oregon, we
observed this curious and elegant tree, recognized com-
monly as the American Conifer Pine, spreading over the
top of the mountain and in a few places
extending downwards with occasional
patches which still presented patches
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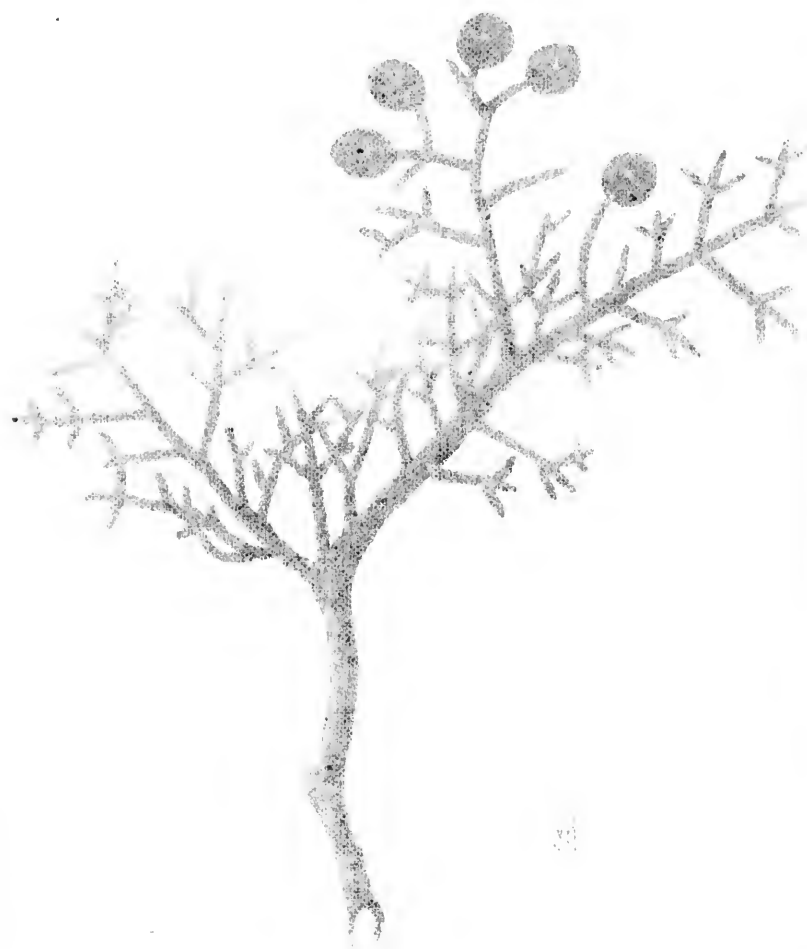


Fig tree (Ficus religiosa) *Illustration of a tree with fruit* *Botanical drawing of a tree*

ROCKY MOUNTAIN JUNIPER.

JUNIPERUS ANDINA, ramis patentibus, foliis quadrifariam imbricatis ovatis obtusiusculis convexis apice subcarinatis, eglandulosis, baccis magnis, caule arboreo.

JUNIPERUS occidentalis? HOOKER, Flor. Bor. Am. 2, 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 towards 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 15 to 20 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 3 or 4 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 interesting. 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 distant, acute, and rather prominently imbricate like the leaves of the Tamarisc. 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 identic 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 60 to 80 feet, and a diameter of from 2 to 3 feet, dimensions also greatly at variance with the present species.

PLATE CX.

A branch of the natural size, with fruit.

BARBADOES CEDAR, (*Juniperus barbadensis*.) With the leaves imbricated in 4 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 20 or more feet in height.

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 Bruléc, 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 colour, 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 50 to 60 feet high, and with a diameter of 2 feet. There is now in Germantown, in this vicinity, on the estate of Mr. Shoemaker, several

trees that are 140 years old, and 75 to 80 feet high by 2 feet in diameter or upwards.

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, MONOECIA MONADELPHIA.

TAXODIUM SEMPERVIRENS, *foliis perennantibus distichis linearibus acutis coriaceis glabris opacis.* LAMBERT'S Pines, (ed. 2.) tab. 64. LOUDON, Arboret. vol. 4, p. 2487, fig. 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 north-west 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, pel-tate, 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, 2, 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 270 feet long, and 32 feet round at 3 feet above the ground. Some few I saw upwards of 300 feet high, but none in which the thickness was greater than those I have instanced."

BALD CYPRESS (*Taxodium distichum*, *Cupressus disticha*. WILLD.) Doctor 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.)

Natural Order, CUPRESSINÆ. (Richard.) Linnæan Classification, MONOECIA MONADELPHIA.

THUJA.* (TOURNEFORT.)

MONOECIOUS.—MALE ament terminal, small and ovoid. *Stamens* many, naked, inserted on a common axis, filaments excentrically peltate, loosely imbricated; *anthers* 4-celled, opening lengthways. FEMALE ament terminal, small; the *scales* spreading, imbricated in 4 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 2, with a long or membranaceous testa, on each side winged. The embryo inserted in the axis of a fleshy albumen of its own length: cotyledones 2, 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.

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

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 tuberculatis, strobilis arcte reflexis. HOOKER, Flor. Bor. Am. 2, p. 165.

THUJA *Menziesii*. DOUGLAS, MSS.

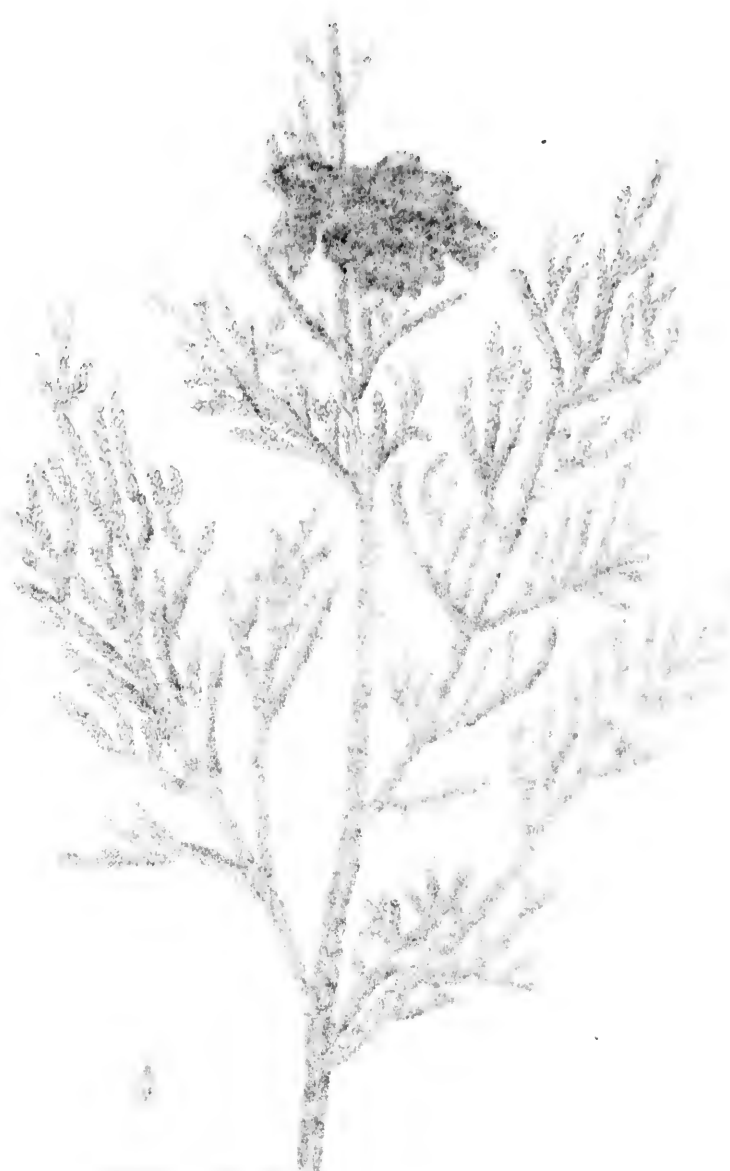
THUJA *plicata*. LAMBERT, Pin. No. 61, (in part.)

THIS is one of the most majestic trees west of the Rocky Mountains, attaining the height of 60 to 170 or even 200 feet, and being 20 to 40 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, towards the sources of the Oregon. We seldom saw it along the coast more than 70 to 100 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 colour 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

* Journal of the Academy of Natural Sciences, Philad. vol. 7.

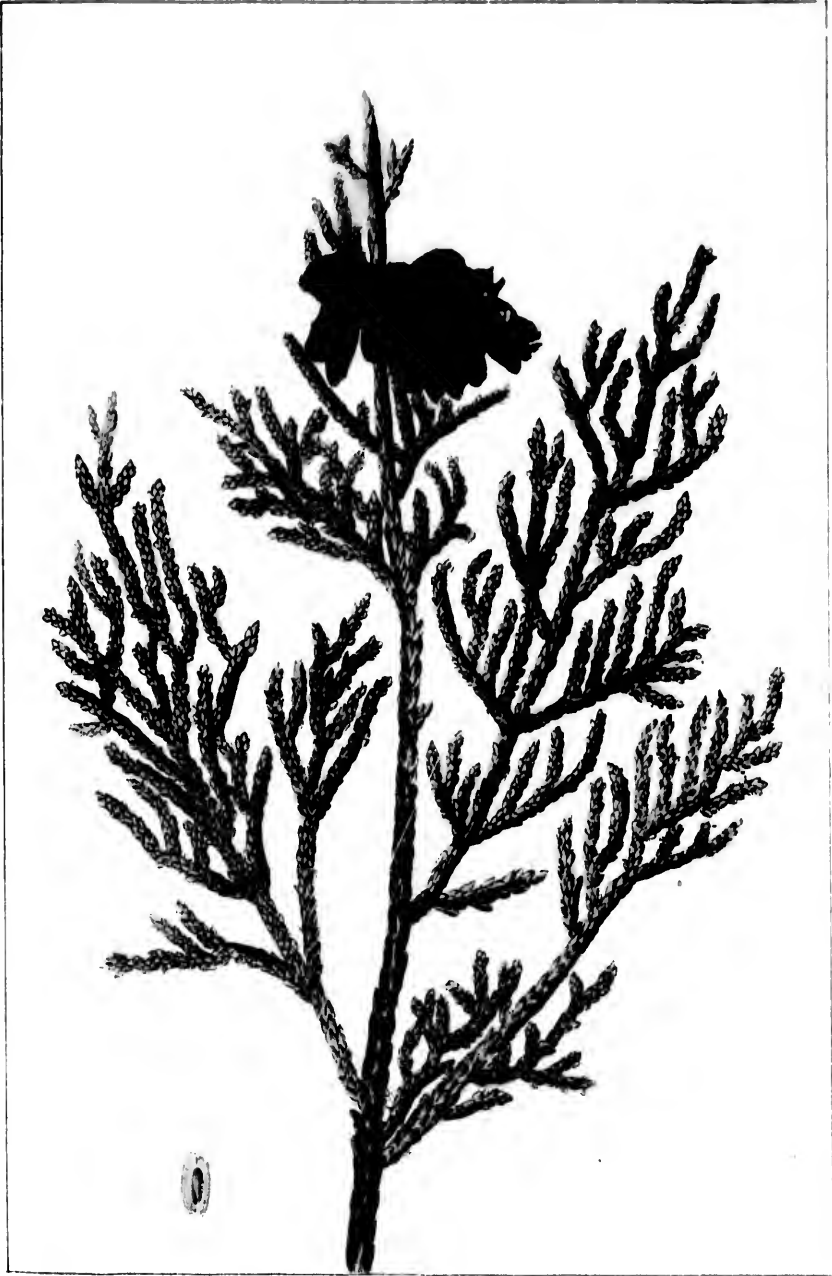
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Juniperus communis

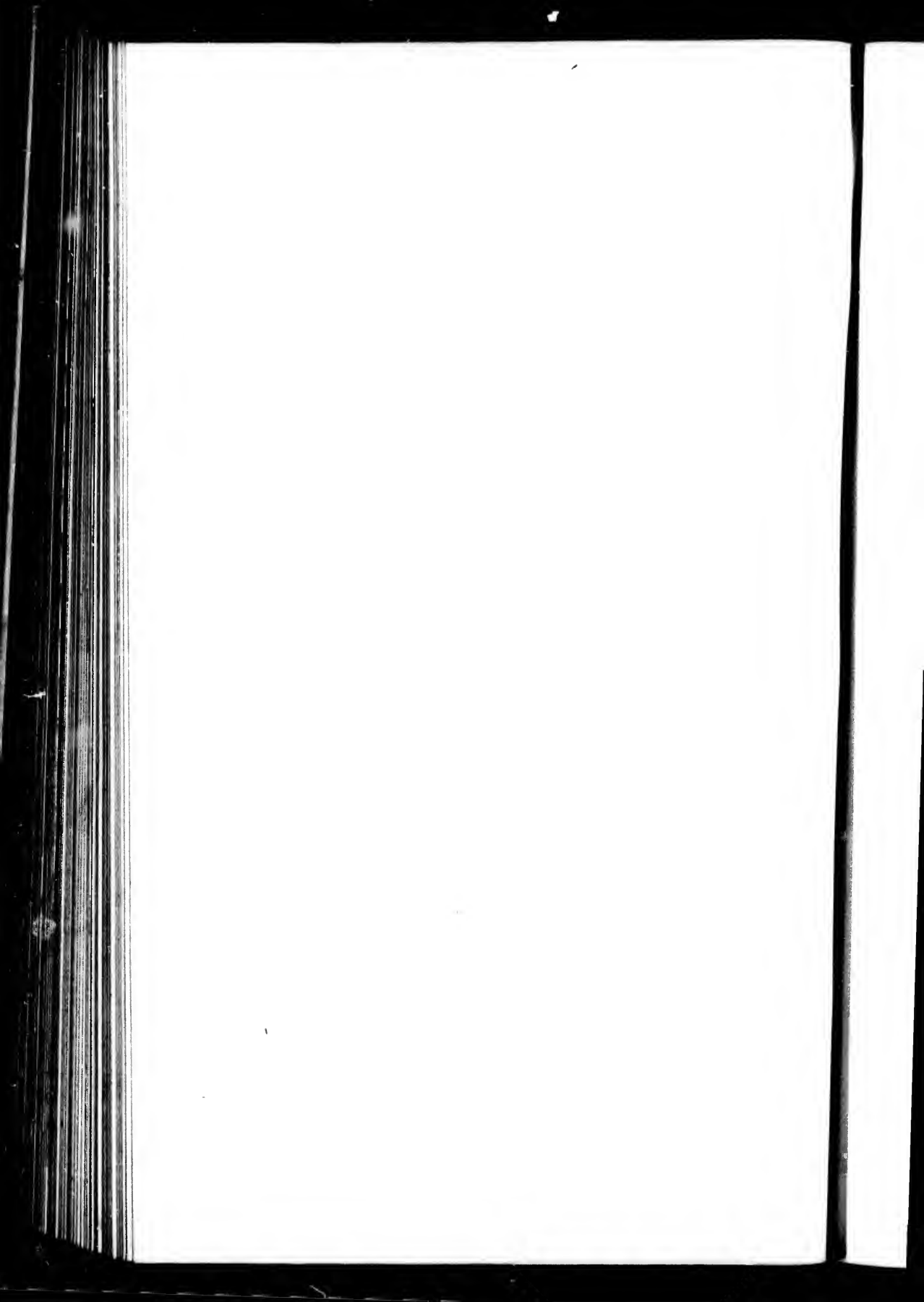
W. & A. G. Smith



Thuja Gigantea.

Gigantea Arborescens

Thuja gigantea



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 the 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 the 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.

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. 6, p. 249. LOUDON, Arboret. 4, 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 N. 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 4 rows, crowded together between the nodes, glabrous, entire, shining, and tubercled in the middle. The cones are solitary and scattered, oblong and nutant; the scales elliptic, obtuse, flat, obsolete 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.

NOOTKA CYPRESS.

Natural Order, CUPRESSINÆ, (Richard.) Linnæan Classification, MONOECIA MONADELPHIA.

CUPRESSUS NUTKATENSIS, *ramis suberectis tetragonis, foliis late-ovatis acuminatis quadrifariam imbricatis dorso carinatis et tuberculatis, glandulis magnitudine pisi majoris globosis ramos breves terminantibus, squamis umbonatis levibus.* LAMBERT, Pin. n. 60, Sine ic. HOOKER, Flor. Bor. Am. vol. 2, p. 165.

THUJA excelsa. BONGARD, Veget. de Sitcha, p. 46.

THIS species, which I did not meet with, was collected at Nutka on the north-west coast by *Menzies*, at Observatory Inlet by *Dr. Scouler*, and as far north as Sitcha by *Bongard*. The branches are sometimes a little compressed, nearly erect and tetragonal. The leaves broad ovate, acuminate, imbricated in 4 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.

PINES.

(LE PIN. Fr.)

*Natural Order, CONIFERÆ. (Jussieu.) Linnæan Classification, MONOECIA 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 afterwards produced from 2 to 5 in a common sphacelous or membranaceous scaly sheath. The aments or flowers are lateral and terminal, conglomerate; the fertile ones persistent and becoming woody cones.

* 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.

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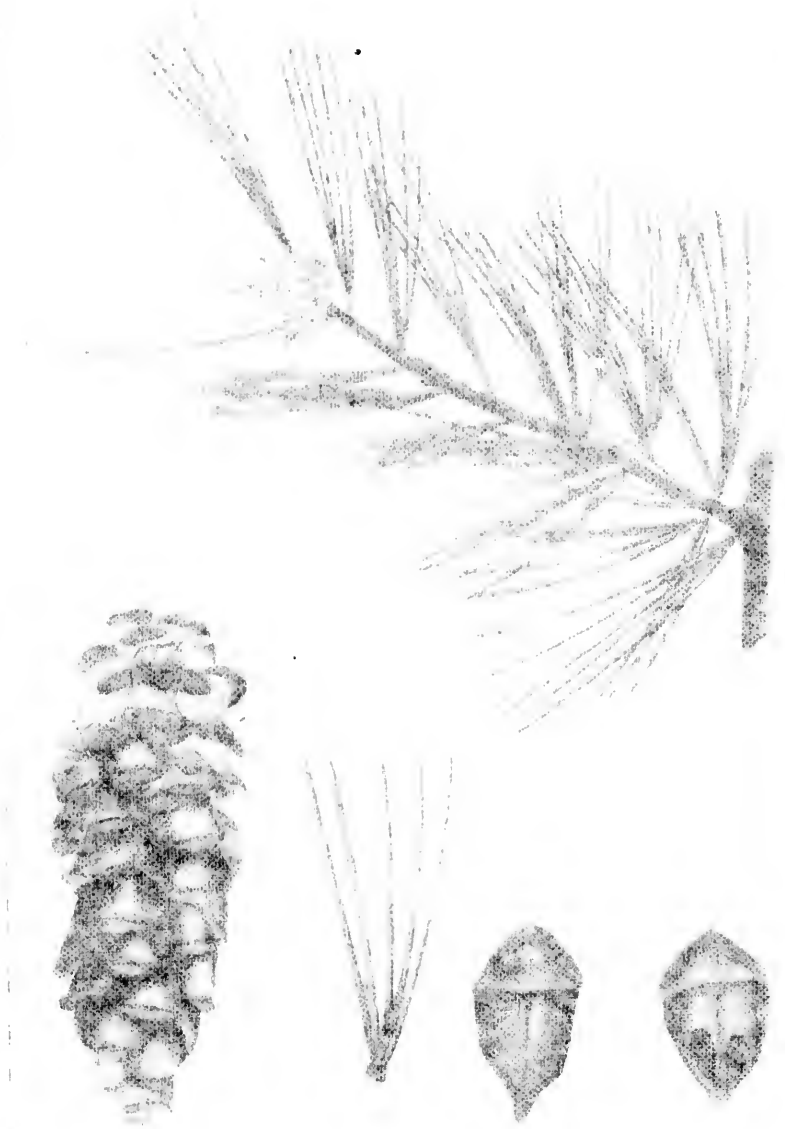
ain, in



Pinus flexilis.

Americana Cambria Pur.

Pine common of America.



18. Pine

AMERICAN CEMBRA PINE.

PINUS FLEXILIS, foliis quinis levibus, vagina abbreviata, comis ovatis, squamis crassis umbilicatis subcarinatis inermis elongatis gibbosis, nucibus duris, seminum alis oblitteratis, antherarum crista lacera acuminata parvula.

PINUS flexilis. TORREY and JAMES, in Long's Expedition Annal. Lyceum, N. York, vol. 2, p. 249.

PINUS Lambertiana, β . HOOK. Flor. Bor. Amer. vol. 2, 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 35 or 40 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 afterwards 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 Timpanagos.

The American Cembra forms a tree of moderate size, 40 to 50 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 their 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 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 sometime 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 120 feet, with a diameter of 3 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 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 Kastrofer. A tree with a trunk of the diameter of 19 inches, when cut down was found to have 353 concentric circles, (indicative of so many years growth.) The wood is very fragrant and retains its odour 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 50 and 60 feet high. The leaves are, however, shorter (2 or 3 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. 2, 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.

SABINE'S OR PRICKLY-CONED PINE.

PINUS SABINIANA, *foliis ternis prælongis acutis margine scabris, strobilis maximis recurvis ovatis aggregatis, squamis patentibus latissimis apicibus longe acuminatis incurvis spinescentibus, nucibus duris.*

PINUS Sabiniana. DOUGLAS, *Lin. Transact.* vol. 16, p. 749. LAMBERT'S *Pines*, (Ed. 2,) t. 80. LONDON, *Arboret.* vol. 4, p. 2246.

THIS splendid and useful species was discovered on the western flanks of the Cordilleras of California, by the late Mr. Douglas. It was found at a great elevation above the level of the sea, being only 1600 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.

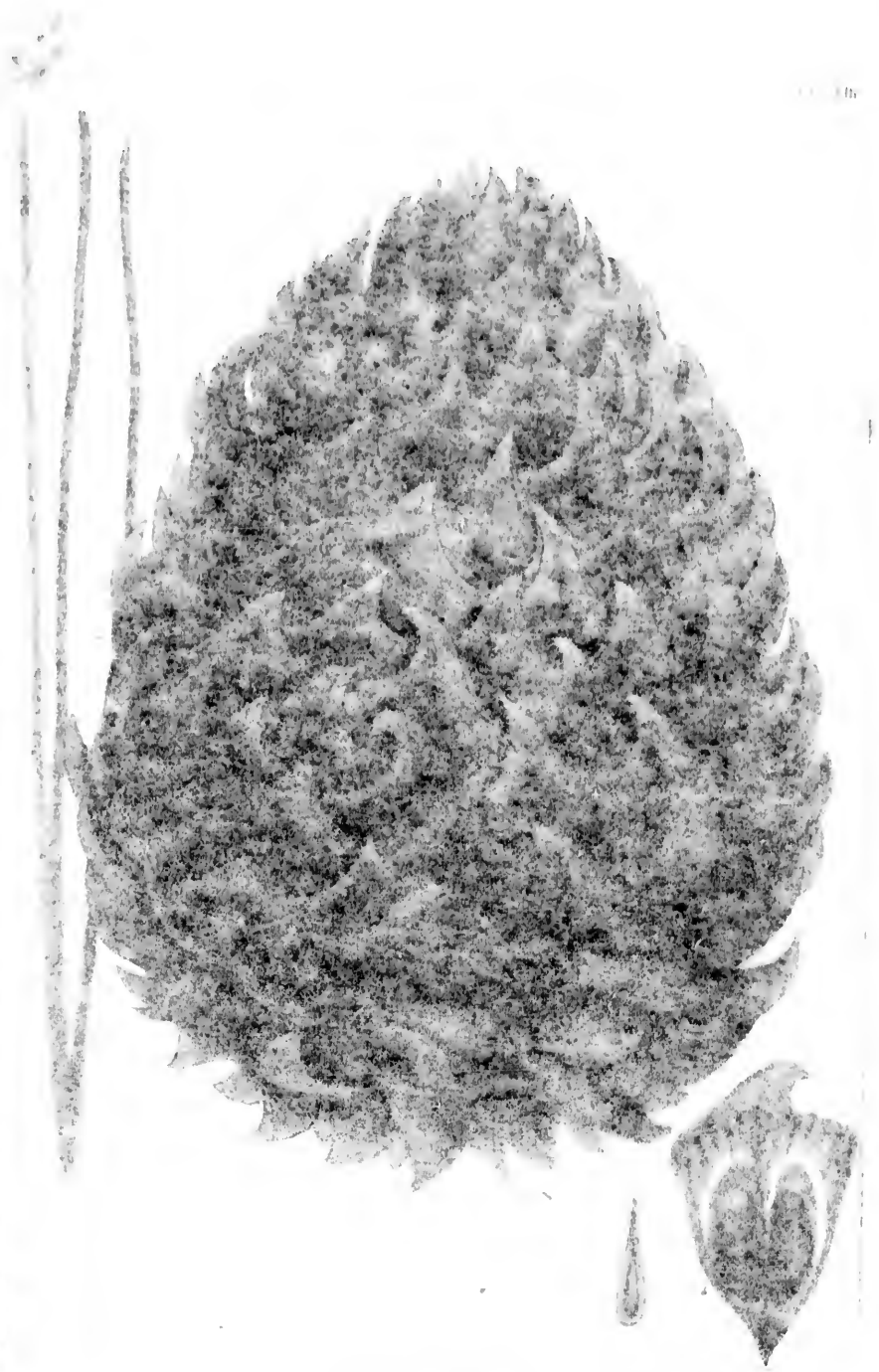
The stems of these Pines are of a very regular form, and grow straight and tapering to the height of 40 to 140 feet, and are 3 to 12 feet in circumference when standing apart, clothed with branches down to the ground. The largest and finest trees are seen in the Mountains of California.

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,

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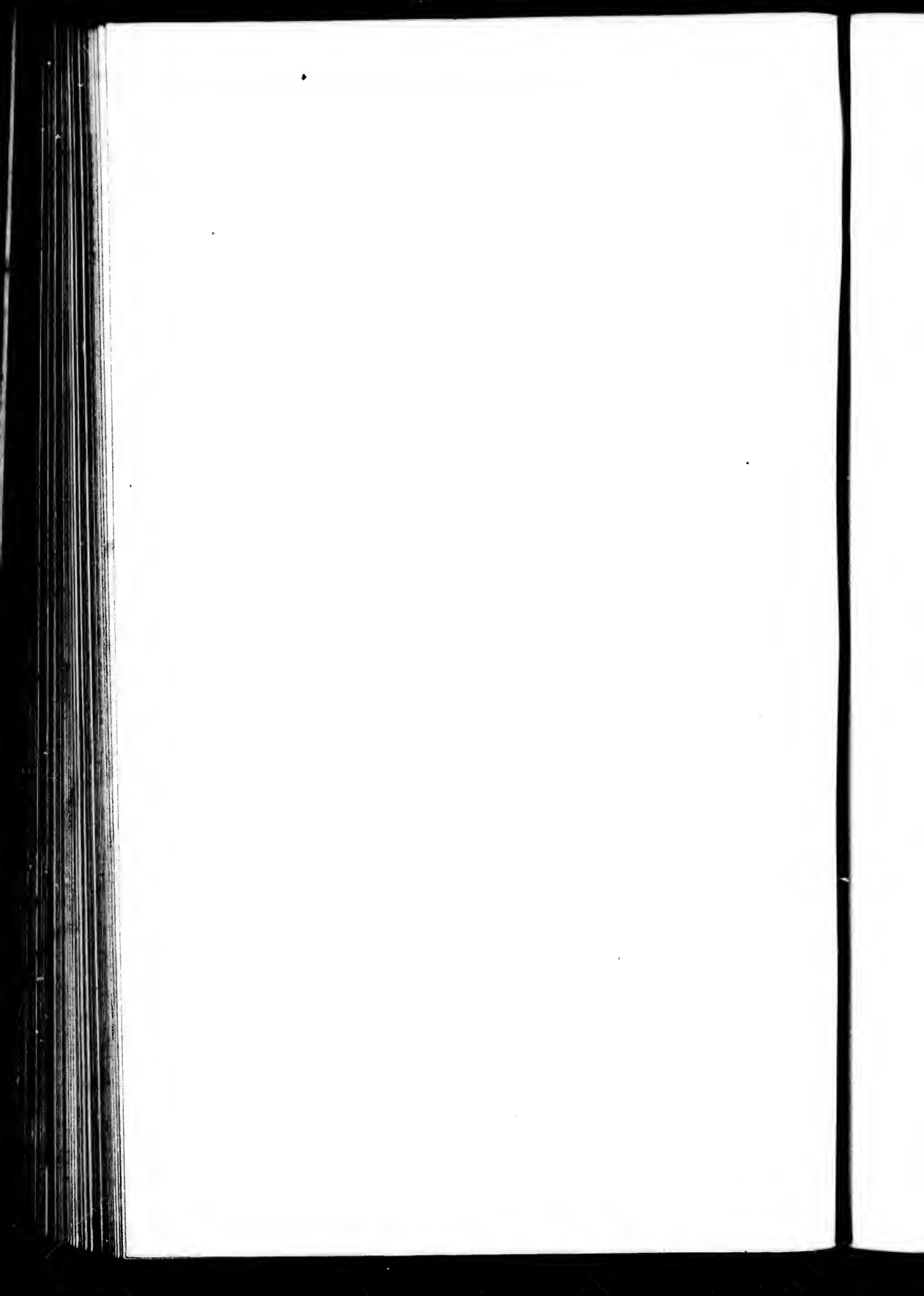
Prickly round linn. **FIBUS** *Prickly round linn.*



Prickly cone Pine

Pinus Sabiniana

Pinus sabiniana (Mill.) B.S.P.



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 3's rarely in 4's, and are 11 to 14 inches in length, serrulated on the margin, the sheath of the leaves $1\frac{1}{2}$ inches long. The cone very resinous, ovate, recurved, pressing on the branch for support, growing 3 to 9 in a verticillated cluster, and remaining on the tree for a number of years; 9 to 11 inches long and 16 to 18 inches round. The scales of the cone are spatulate, $2\frac{1}{4}$ inches long, with a strong, sharp, incurved 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 7 to 12.

It was named by Mr. Douglas in honour 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.

COULTER'S PINE.

PINUS COULTERI, foliis ternis prælongis compressis, vaginis filamentosolacris, strobilibus oblongis solitariis maximis, squamis cuneatis, apicibus elongatis incrassatis lanceolatis mucronatis ancipiti-compressis aduncis. DON in Lin. Trans. vol. 17, p. 440. LAMB. Pin., vol. 3, tab. 83. LOUDON, Arbor. Brit. vol. 4, p. 2250.

THIS magnificent species of Pine was discovered by Doctor 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 3 to 4000 feet above its level. It was accompanied by the *Pinus Lambertiana*.

The tree rises to the height of 80 or 100 feet with large permanently spreading branches, and the trunk is 3 or 4 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 4 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, 3 or 4 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.

SMALLER PRICKLY-CONED PINE.

PINUS MURICATA, *foliis ternis? strobilis inaequilateri-ovatis aggregatis, squamis cuneatis apice dilatatis umbilico-elevato mucronatis; bascos externae elongatis ancipiti-compressis recurvato-patentibus.* DON, in *Lin. Trans.* 17, p. 441. LAMBERT, *Pin.* 3, tab. 84. LOUDON, *Arbor.* 4, 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 3000 feet above the level of the sea, distant about 10 miles. The tree is straight and rather stunted, not exceeding 40 feet in height. The cones grow 2 or 3 together, and are about 2 inches long and 3 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 praelongis tortuosis, vaginis brevibus, antherarum crista rotundata integra, strobilis ovatis reflexis, squamis compressis subquadrangulatis apice spinulosis recurvatis.

PINUS ponderosa. DOUGLAS, MSS. LODDIG, Catal. ed. 1836. LONDON, Arboretum Britannicum, vol. 4, p. 2243, fig. 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 9 to 11 inches long, 3 in a sheath, which is from half an inch to 1 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 outwards; the scale is an inch long.

The trees I observed in California, growing in a poor soil, were not more than 12 to 20 feet high.

OREGON PITCH PINE.

PINUS INSIGNIS, foliis ternis elongatis tortuosis, strobilis ovatis acutis deflexis, squamis tuberculatis retusis inermibus inferioribus conicis reflexis.

PINUS insignis. DouG. MSS. Loudon, Arboretum Brit. 4, p. 2265, fig. 2171, 2172.

PINUS tuberculata. Don, Lin. Trans. vol. 17, p. 442. Lamb. Pin. 3, t. 85. Loudon, Arbor. 4, 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 3 to 4½ inches long. Cone 3½ to 4 inches long. In the young growing plant near London, 5 to 7 inches.

This is, I apprehend, the *Pinus resinosa* of Hooker, Flor. Bor. Am. 2, p. 161, as far as the locality of the north-west 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 3's.

I cannot perceive any specific distinction between the present and the cone described by Don of his *P. tuberculata*, figured by Loudon. 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 3's, slender and about

4 inches long, with the margin and inner ridge finely serrulated and grooved internally on either side the mid-rib. 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.

SPREADING-CONED PINE.

PINUS RADIATA, *foliis ternis, strobilis inaequilateri-ovatis squamis radiato-rimosis umbilico depresso truncatis; bascos externa triplo majoribus gibbosis subrecurvis.* DON, in *Lin. Trans.* vol. 17, p. 442. LAMBERT, *Pin.* 3, tab. 86. LOUDON *Arboretum* 4, 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 100 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.

Of the *PINUS CALIFORNIANA* of Loiseleur Deslongchamps in the *Nouveau Duhamel*, 5, p. 243, too little is known to consider it as a well defined species. As a tree it is probably identic with one or other of the preceding species, being observed in the neighbourhood of Monterey, and seeds were collected by the gardener Callignon in the expedition of La Peyrouse. The cone producing eatable seeds like the *Cembra*, is, however, a character wholly at variance with any species growing round Monterey.

TWISTED-BRANCHED PINE.

PINUS CONTORTA. Douglas. Loudon, *Arbor*, 4, p. 2292, fig. 2210 and 2211.

This plant is considered by Hooker, 2, p. 161, as a mere variety of *P. inops* with the leaves less rigid. Growing at Sitcha, 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 north-west coast; on Mount Rainier, near the snow, not exceeding 10 feet in height, and according to Hooker, the specimens exactly agree with the same species from the United States.

WHITE PINE.

PINUS STROBUS, foliis quinis gracilibus, vaginis nullis, strobilis elongatis subcylindraceis cernuis, squamis lacis planiusculis, antherarum crista minuta, setacea, bifida.

PINUS Strobis. LINN. Sp. pl. PURSH. Flor. Am. 2, p. 644. HOOKER, Flor. Bor. Am. 2, 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." LONDON, Arbor. 4, p. 2201, fig. 2208 and 2209. LAMBERT, Pin. vol. 2, p. 3, tab. 87.

RESPECTING the geographical limits of this species, Hooker adds in his Flora. From Nova Scotia and Canada, to the Saskatchewan 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, towards the north-west 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 the Oregon. In the vicinity of Portsmouth, I am informed by John Elwyn, Esq., a tree was cut down some years ago which measured 200 feet in height. Naugenheim also remarks, that from the size of two masts for 74 gun-ships, that he saw in the Plymouth dock-yards, which measured in the whole piece 108 feet each, that such a tree must have been 200 feet long, and 5 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 Nepal in India. That species, honoured with the native title of the "King of the Firs," attains to the height of 120 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 M'Culloch), 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." M'Culloch adds, that "many passages to the same effect might be produced from the

evidence of persons of the greatest experience in ship-building." (*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 37 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 weatherboarding 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 127 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*? ART. *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 above tide, is inferior to that from the hills at intermediate heights.

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. 15, p. 500. LAMB. Pin. (ed. 2d), vol. 1, t. 34. LAWSON'S Manual, p. 361. LOUDON Arboret. vol. 4, 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 100 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 towards 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 abundance of seed. The trees did not form dense forests, in the manner of the other pines of the north-west 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 20 to 60 feet. A specimen overturned by the winds was in length 215 feet, its circumference at 3 feet from the ground was 57 feet 9 inches, and at 134 feet from the ground, 17 feet 5 inches. The trunk presents an erect shaft, devoid of branches of from 100 to 170 feet elevation covered with a very smooth

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EXPERIMENTAL

The following experiments were conducted to determine the effect of the various factors mentioned above on the rate of polymerization.

1. Effect of Temperature

The effect of temperature on the rate of polymerization was studied by carrying out the reaction at various temperatures. The results are shown in Table I. It is seen that the rate of polymerization increases with increasing temperature. This is to be expected since the rate of reaction is generally increased by an increase in temperature. The activation energy of the reaction was calculated from the Arrhenius plot and found to be 15.0 kcal/mole.

The effect of the concentration of the various reactants on the rate of polymerization was also studied. It was found that the rate of polymerization is directly proportional to the concentration of the monomer and inversely proportional to the concentration of the initiator.



Pinus Lambertiana.

Gigante Pine

Pin gigante de Lambert.

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light brown bark. The pendulous branches form an open pyramidal head, like that of a fir-tree. The leaves are between 4 and 5 inches long and grow together, like the *strobis* in clusters of 5, with similar short, deciduous sheathes; they are rigid, of a bright-green colour, 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 11 inches in circumference at the thickest part, and vary from 12 to 16 inches in length! The scales are loosely imbricated, dilated and rounded above, and perfectly destitute of armature. The seeds are 8 lines long and 4 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 12 to 13.

The whole tree produces an abundance of pure amber coloured resin, which, when it exudes from trees which are partly burnt, by some chemical change, loses its usual flavour and acquires a sweet taste, in which state it is used by the natives as sugar to flavour 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 56 in the space of $4\frac{1}{2}$ inches on the external side.

It is allied to *P. strobis*, from which, however, it is essentially distinct, but almost equally hardy in cultivation.

PLATE CXIV.

Cone half of the natural size. a. The leaves.

BANKS' OR LABRADOR PINE.

PINUS BANKSIANA, *foliis brevibus geminatis rigulis divaricatis obliquis strobilibus recurvis tortis, squamis incrimibus*. LAMB. Pin. (ed. 2,) vol. 1, tab. 3. PURSH. Flor. Bor. Am. 2, p. 642. LOUDON, Arboretum, 4, p. 2190.

PINUS rupestris, (Gray Pine.) MICH. Sylva, tab. 136.

PINUS hulsonia. LAMARCK, Encyc. 5, p. 339.

PINUS sylvestris δ *divaricata*. SOLANDER in Ait. Kew, vol. 3, p. 366.

NOTWITHSTANDING the dwarf size of this species in many situations, Doctor 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 40 feet and upwards in favourable situations; but the diameter of its 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 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, towards 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.

* Narrative of a Journey to the Polar Seas in 1819 and 1822.

Doctor Engelmann of St. Louis, informs me, that this Pine accompanied by *P. strobus*, *P. variabilis* and *Abies canadensis* grows on the islands of Lako Michigan.

In the famous Pinetum at Dropmore, in 1837, according to Loudon, there was a pine of this species 27 feet high, with the diameter of the trunk 18 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 30 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 an 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, aculeis squamarum elongatis subulatis incurvis, inferioribus reflexis.*
 PURSH, Flor. Amer. Sept. vol. 2, p. 643. MICHAUX, tab. 140. LAMB.
 Pin. (ed. 2,) 1, tab. 17. LOUDON, Arboretum, 4, p. 2197, fig. 2079,
 and figs. 2077 and 2078, (excellent figures of the cone, &c.)

A tree 40 to 50 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 1000 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 introduced the species into England, (according to Loudon,) 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 Alleghanys, 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 34 feet, with a diameter of 1 foot 9 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 46 to 48 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 top-masts. 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.)

Natural Order, CONIFERÆ. (JUSSICU.) Linnæan Classification, MONOECIA 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 2 rows.

These are evergreen trees of Europe, Asia and America, of tall, erect and often pyramidal forms, clad with a profusion of accrose 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.

§ I. *ABIES proper.* Scales of the cone deciduous; anthers dehiscing transversely.

* From *abeo*, to rise, in allusion to their aspiring growth; or from *apios*, a pear tree, in reference to the form of their fruit.

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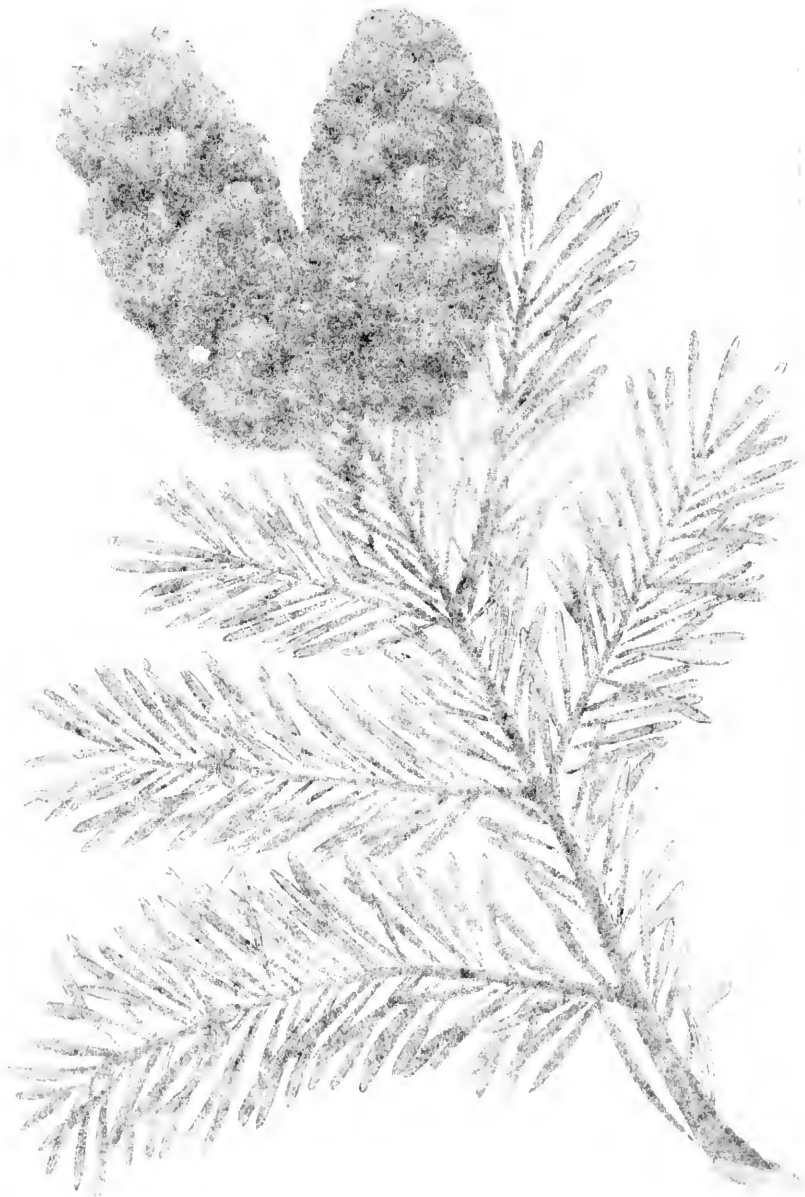
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Abies Douglasii

Douglas's fir

Douglas fir



Abies Balsamea

Mill. Bot. System.

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 $67\frac{1}{2}^{\circ}$, within 20 miles of the Arctic Sea, it attains the height of 20 feet or more. In its native forests it rarely exceeds 50 feet in height. There is, however, in Down in Ireland, (according to Loudon,) a tree 60 years planted, which measures 55 feet in height, and another in Galway, at Cool, is 56 feet high, with a diameter of $2\frac{1}{2}$ feet.

DOUGLAS'S SPRUCE FIR.

ABIES DOUGLASHI, (Sabine MSS.), *foliis linearibus obtusis subtus albidis linea media elevata marginibus reflexis, strobilis erectis ovatis, squamis paucis latissimis, bracteolis obovato-lanceolatis exsertis trifidis reflexis, lacinia media subulata lateralibus membranaceis crosis longicri.*

PINUS (ABIES) *Douglasii*. HOOKER, Flor. Bor. Am. 2, p. 162, tab. 183. LAMB. Pin. vol. 3, t. 90.

PINUS *taxifolia*. Parsh. Flor. Am. 2, p. 640. LAMB. Pin. (Ed. 2,) 2, tab. 47.

THIS plant, in the dense forests of the north-west 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 300 feet. The trunk measures from 6 to 15 feet in diameter. Of the prostrate stump lying at Fort George, near the mouth of the Oregon, noticed by Douglas, 150 feet still remained, without any branches, and it gave a circumference of 48 feet at 3 feet from the ground. Its ordinary height is 150 to 200 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 9 to 15 inches in thickness. The leaves strongly resemble those of the Balm of Gilead or Balsam Fir. The cones are about 3 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, 2-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

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Abies Menziesii.

Menzies' Spruce Fir

Saxif. de Menzies.

about that of the Common European Spruce. A plant
Droopmore and I collected in 1858 was dried, pressed,
and bore several seeds.

This species was first named by J. M. V. Murray
at Stockholm, Sweden, in 1858, and was first described
by Vancouver in 1798. It was first introduced into
this country by the late General W. B. Ewing, and
was first named by him *Abies balsamea*. The
name of *Pinus strobus* was given to it by the
various authors, and it was first introduced into
along the coast of the west from a latitude of 40° to 52°
and extends the principal part of all the gloomy forests
of this country 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 the
high alpine ravine, and in the lofty fens of Great
Toupanagos, reduced to an almost prostrate
50 feet elevation.

Pinus strobus

Pinus strobus

MINNESOTA SPECIES

ABIES-MEXICANA, *var.*

Abies balsamea (MILL.) B.S.P.

Abies balsamea (MILL.) B.S.P.

Abies balsamea

PINUS-MEXICANA, LAM.

p. 2221, t. 2234.



Abies Menziesii

Abies Menziesii

Abies Menziesii

about that of the Common European Spruce. A plant at Dropmore in England, in 10 years had attained 19 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 north-west 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 Timpanagos, reduced to an elegant spreading tree of 40 or 50 feet elevation.

PLATE CXV.

A branch of the natural size with the cone.

MENZIES'S SPRUCE FIR.

ABIES MENZIESII, ramis verrucosis, foliis planis acutis brevibus undique versis subtus argenteis, strobilibus cylindraccis, squamis scariosis cuneato-ovalibus parvulis margine laceris, bracteolis brevibus integris acuminatis.

PINUS Menziesii. LAMBERT, Pines, vol. 3, tab. 89. LONDON, Arbor. 4, 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, leaf-like, persistent, thin scales, irregularly torn on the edges, the bracteoles are not externally visible, small, and acuminate. 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 3 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, excavated 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 north-west 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 30 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 colour.

S. W. Roberts, Esq., Civil Engineer, writes to me, "some years ago I was the Resident Engineer of the Portage Rail Road over the Alleghany Mountain. When it was commenced in 1831, we cut a road, 120 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. Hem-

lock 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 Cycl. No. 3.

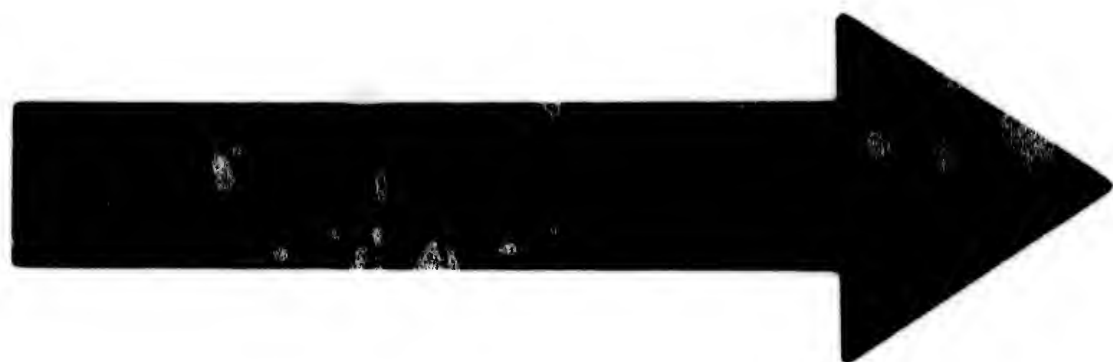
PINUS grandis. DOUGLAS, MSS. LAMB. Pin. vol. 3, tab. 94.

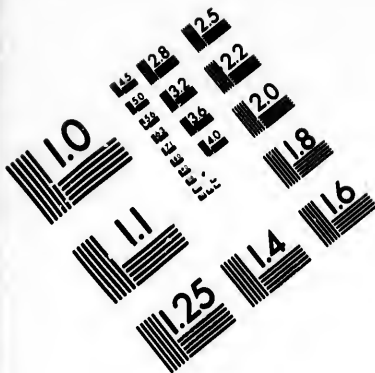
PICEA grandis. LOUDON, 4, p. 2341, fig. 2245 and 2246.

A TALL stately tree, akin to *A. balsamea*, and attaining a height of 170 to 200 feet. According to Douglas, a native of Northern California, in low moist valleys, but we found it abundant, and constituting considerable tracts, betwixt Fort Vancouver and the neighbouring saw-mill, 6 or 7 miles above the fort, where many logs had been cut down and sawn into planks, which were taken for sale to

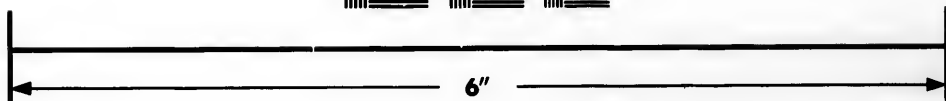
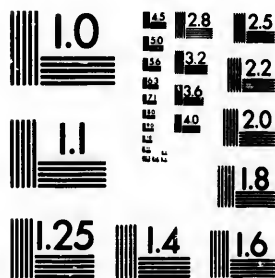
Oahu, one of the Sandwich islands. It also grew in the pine woods of Wappatoo island, in both which places it was frequently about 240 feet in height. The wood was found to be soft, white, and coarse-grained, yet very well suited for flooring and other purposes when better timber could not be had. This tree mostly presents a tall naked shaft of a 100 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 2 rows, linear, roundish at the point, and often notched, green above and silvery beneath, somewhat dilated towards 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 $3\frac{1}{2}$ inches long and 2 inches broad, of a brown colour; the scales transverse, very broad, deciduous, and quite entire. Bracteoles ovate-acuminate, irregularly notched along the margin, and much shorter than the scales.

The *Pinus amabilis* of Douglas, is probably a mere variety of the present. Loudon 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, 6 inches long and $2\frac{1}{2}$ 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.





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



**Photographic
Sciences
Corporation**

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DECORATED SILVER FIR.

ABIES NOBILIS, *foliis falcatis brevibus acutis subtus argenteis, strobilis erectis, ovato-cylindraceis elongatis, squamis latissimis, bracteolis dilatato-spathulatis deflexis squamas tegentibus, erosis medio subulato-acuminatis.*

PINUS nobilis. DOUGLAS, MSS. LAMB. Pin. vol. 2, last figure. HOOKER, Flor. Bor. Amer. 2, p. 162.

PICEA nobilis. LOUDON, Arboret. 4, p. 2343, 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 3 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, 6 to 7 inches long and 8 to 9 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, incurved and quite entire on the margin. The leaves are crowded in 2 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.*



Andromeda

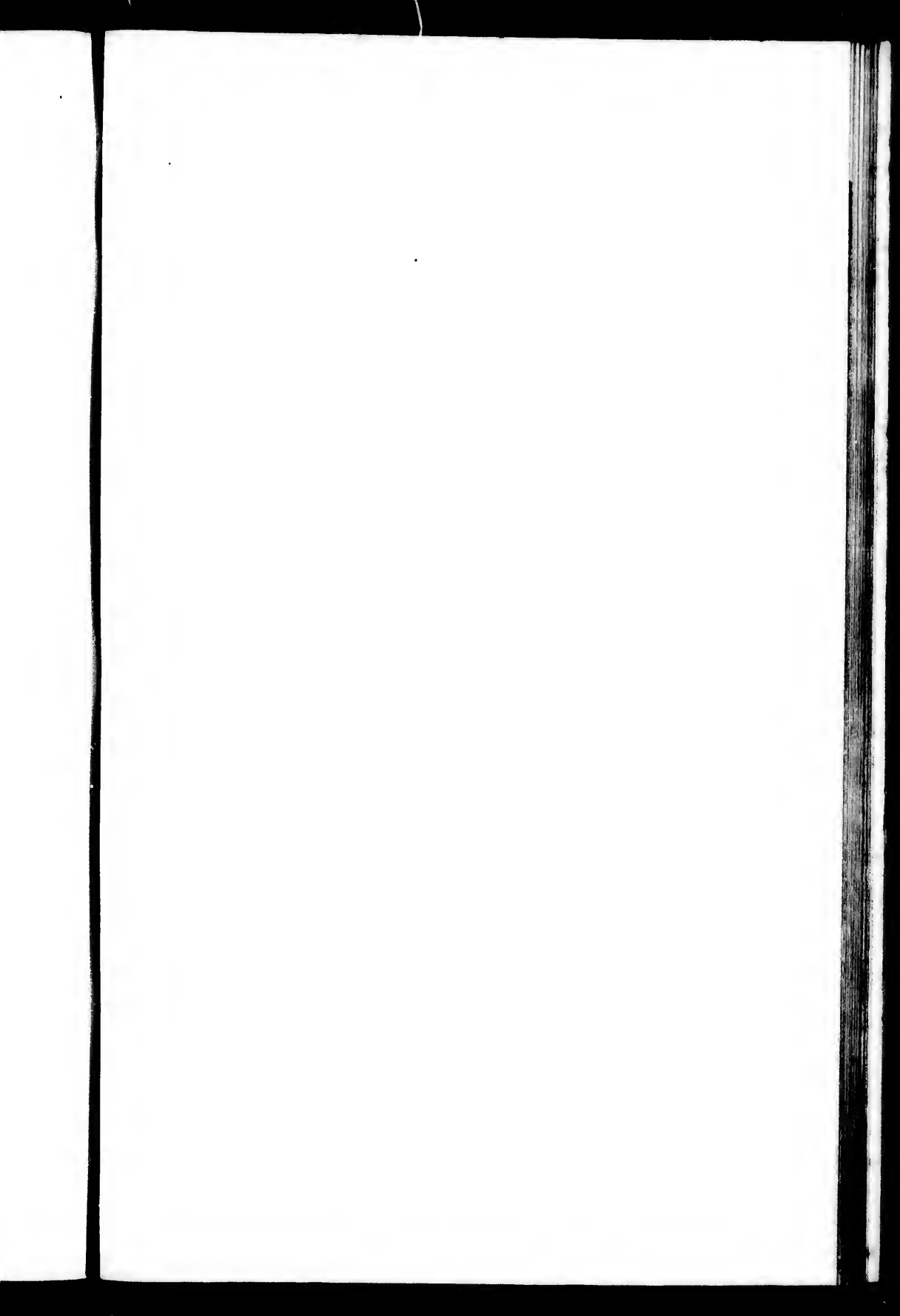
Andromeda



Abies Nobilis

Decorated Silver Fir

Sapin noble





Abies Bracteata

Lea's coned Silver Fir

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Alnus Bracteata

Alnus Bracteata

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Douglasii, 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. 17, p. 443. LAMBERT'S *Pines*, vol. 3, tab. 91. LOUDON, *Arboret.* 4, p. 2348, fig. 2256.

PINUS venusta. DOUGLAS, in *Compan. to Botan. Magaz.* 2, 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 1000 feet lower down than the situation of the *Pinus coulteri*. According to this gentleman, the nearly naked, slender trunk, rises to the height of 120 feet, as straight as an arrow, and not exceeding 2 feet in circumference. The upper third of the tree is clothed 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 sin-

gular 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 2 rows, linear mucronate, flat and rigid, 2 to 3 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, 4 inches long and 2 inches in diameter, scaly at the base. Scales of the cone kidney-shaped, roundish, concave, stalked, thick and indurated, pale-brown, incurved on the margin, crenulate and externally glaucous. The bractcoles wedge-shape, coriaceous and rigid, of the same colour as the scales but shorter, 3-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 not yet introduced into Europe.

PLATE CXVIII.

A twig with the cone reduced. *a.* The leaf. *b.* The bracte.

DOWNY-CONED SILVER FIR.

ABIES LASIOCARPA, *foliis obtusis prelongis concoloribus, strobilis? squamis latis subrotundatis extus dense fusco-pubescentibus, bracteolis late obovatis vix denticulatis squama subduplo-brevioribus apice mucronato-acuminatis.*

PINUS (ABIES) lasiocarpa. HOOKER, *Flor. Bor. Amer.* 2, p. 163.

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Abies Fraseri

Fraseri B.S.P. in Pin.

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This specimen was discovered in the vicinity of the falls of the Fraser, in the north-western part of the province, by Mr. Deane, in 1845. It is the only known or preserved specimen of the solitary species of the genus found in the mountains of the province, and is now in the collection of the British Museum.

FRASER'S REDWOOD

ABIES FRASERI (MILLER) B.S.P. (1845) *Abies* *Fraseri* (Mill.) B.S.P.

Abies, *Fraseri* (Mill.) B.S.P. (1845) *Abies* *Fraseri* (Mill.) B.S.P.

Pinus *Fraseri* (Mill.) B.S.P. (1845) *Pinus* *Fraseri* (Mill.) B.S.P.

Pinus, *Fraseri* (Mill.) B.S.P.

Pinus *Fraseri* (Mill.) B.S.P. (1845)

This species was first discovered in the mountains of the province, by Mr. Deane, in 1845. It is the only known or preserved specimen of the solitary species of the genus found in the mountains of the province, and is now in the collection of the British Museum.

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It is omitted by Deane, in his description of the species.



ADAMS, S. W. (1857) *Illustrations of the Pine Family*

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THIS remarkable species, as it regards the character of the scales of the cone, was, it appears, discovered on the north-west 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. Amer.* 2, p. 639. LAMB. *Pin.* (ed. 2d,) vol. 1, tab. 42.

PICEA Fraseri. LOUDON, *Arboretum*, 4, 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 Mr. Pursh, who first described it. It is a smaller tree than *A. balsamea*, or rather compact bush seldom exceeding 10 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 15 feet high, and had for 2 or 3 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, subfalcate, flat, emarginate, rarely entire, the margin and rib prominent and obtuse, beneath silvery and sometimes bisulcate, about half an inch long. Masculine aments terminal, crowded, oblong, subtended at base by numerous obovate fimbriate membranaceous caducous scales. Anthers 2-celled, opening longitudinally, with a small subreniform, entire, callous crest. Cones aggregated by 2 or 3 together, sessile, oblong, obtuse, cinereous, puberulous, about 2 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 Montezuanae*

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 prelongis acuminatis striatis, margine scabris intus carinatis concoloribus, amentis masculis fuscatis elongatis, antherarum crista rotundata convexa integriuscula maxima.*

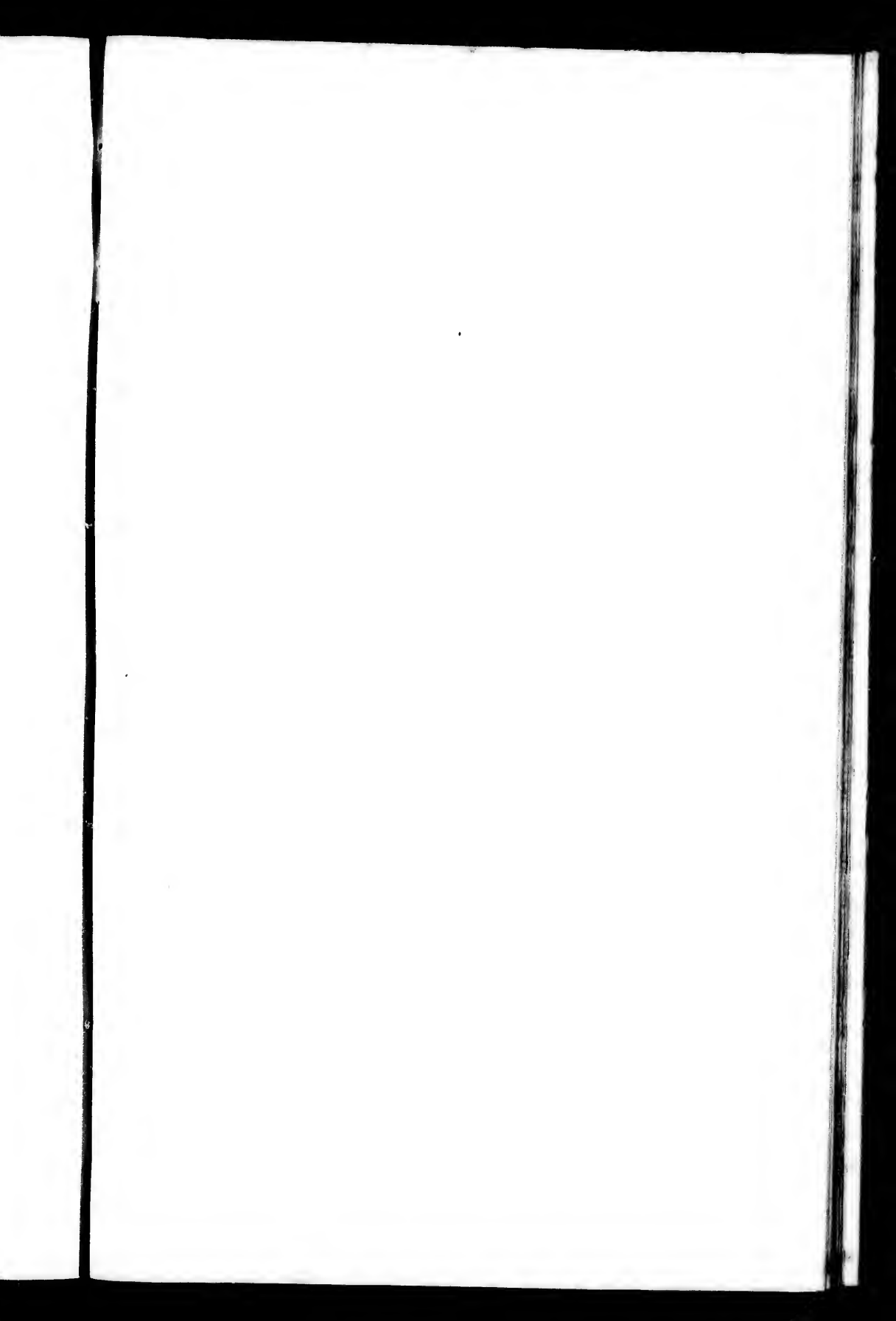
LEAVES always in 3's, 7 to 8 inches long, rigid and serrulated, with a longish rigid acuminate point, the keel shallow and also rough; sheath persistent, rather short, the outer stipular scales torn on the margins. Male aments about two inches long! the scale-like brown summits of the connectivum of 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 2-celled.

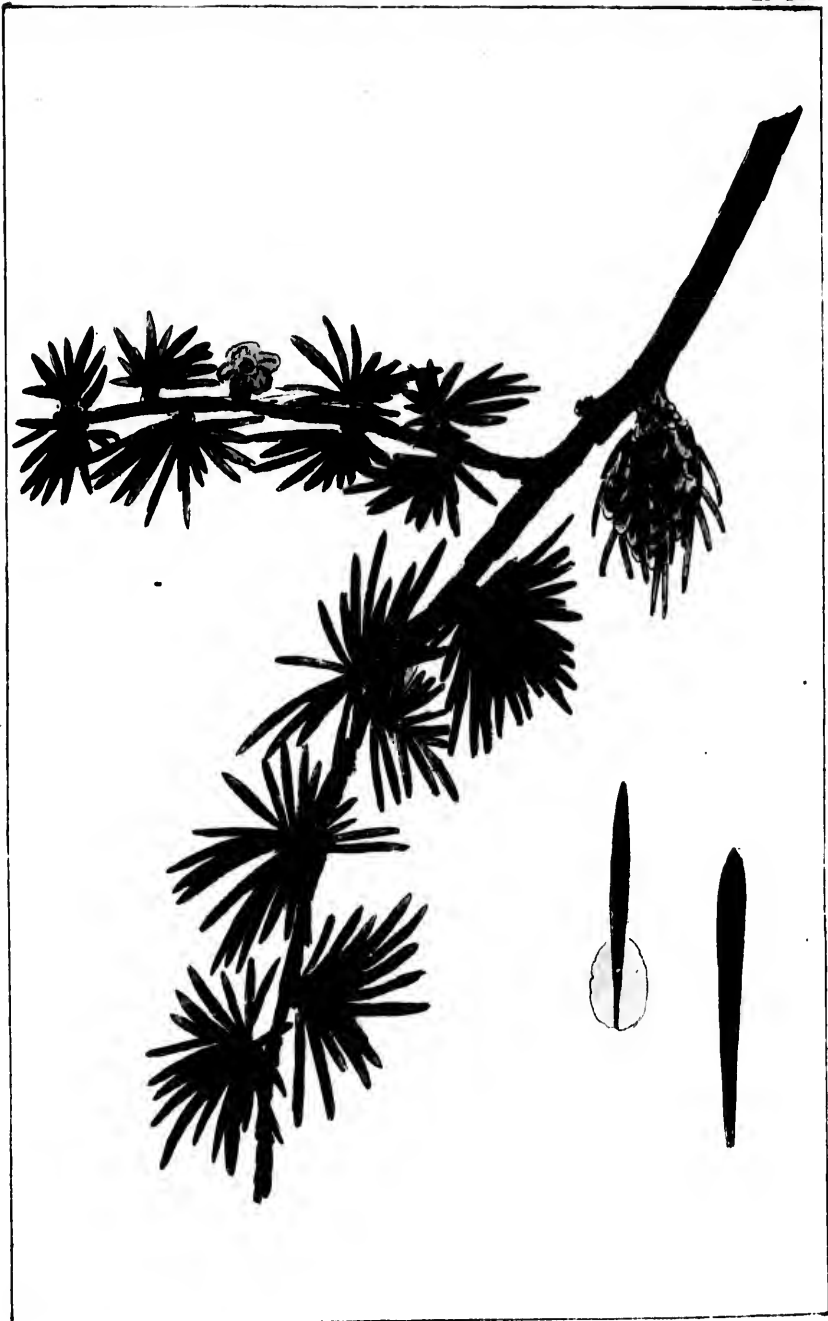
SINCLAIR'S PINE.

PINUS SINCLAIRII, *foliis ternis acicularibus elongatis gracilibus supra canaliculatis dorso convexis margine asperis, strobilis basi obliquis pedalis oblongis, squamis cuneatis elongatis, apicibus crassis elevato-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
VOL. III.—19

supposed *P. rigida* brought from California by Menzies, and forms a stately tree 70 or 80 feet high. The leaves are ternate or occasionally binate, 3 to 4 inches long, rigid, sharp but slender. The cone is about a foot long. The scales 2 to 3 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*.





Larix occidentalis.

Western Larch

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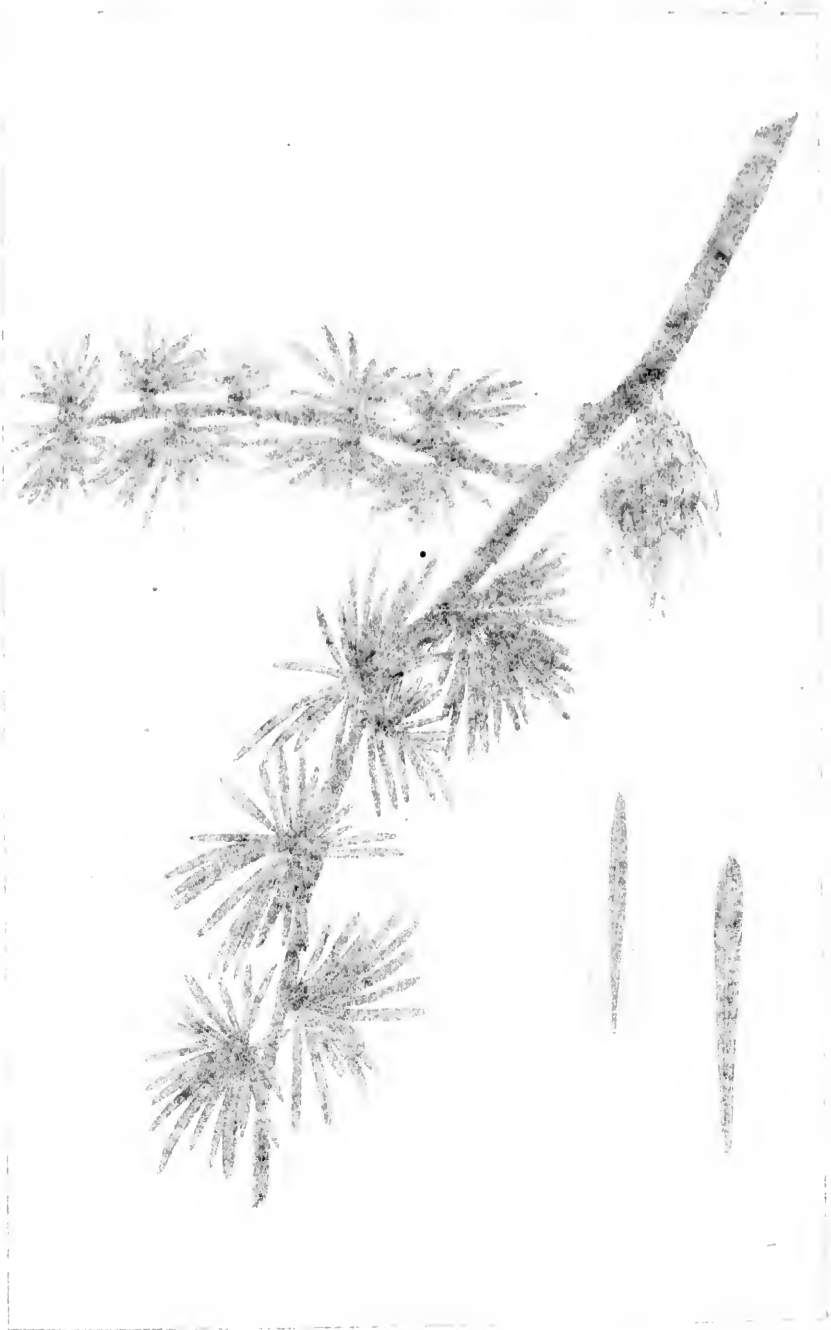
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Pinus resinosa

Fig. 1

Fig. 2

LARCH.

(LE MELEZE. Fr.)

Natural Order, CONIFERÆ. Linnæan Classification,
MONOECIA MONANDRIA.

LARIX.* (TOURNEFORT.)

The plants of this genus differ from the Pines and Firs in having deciduous clustered leaves. Anthers opening longitudinally. Bractes coloured 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 sublanccolatis integris longissime foliaceo-acuminatis squarrosis.

* Supposed to be from the Celtic *lar*, fat, in allusion to the abundance of resin which it affords.

WE met with this, apparently distinct species of Larch, in the coves of the Rocky Mountains on the western slope towards the Oregon. It resembles the European Larch, but the leaves are 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 40 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 60 to 130 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 colour, 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 10 years. The wood of the Larch, according to Hartig, weighs 68lb. 13oz. per cubic foot, when green, and 36lb. 6oz. 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 7 or 8 pounds for 40 or 50 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 bracte of the cone.

PISONIA.*

(PISONE. Fr.)

Natural Order, NYCTAGINEÆ. (JUSS.) *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* 6 to 8, 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.

PRICKLY PISONIA OR FINGRIGO.

(PISONE EPINEUSE. Fr.)

PISONIA ACULEATA, *spinis axillaribus, patentissimis; foliis ovatis, utrinque acutis, subacuminatis, glabriusculis; calycibus demum aculeatis glutinosis.*

PISONIA aculeata. LINN. Sp. pl. JACQ. Amer. p. 274. GÆRTNER. dc Fruct. cent. 5, 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.* BROWN, Jam. p. 258.

* Named by Plumier in honour of Piso, who wrote on the Natural History of Brazil.

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INDEX

General Index, xvii
Particular Index, xviii

1890

FRIGHTS INDEX

1890

General Index, xvii
Particular Index, xviii
1890

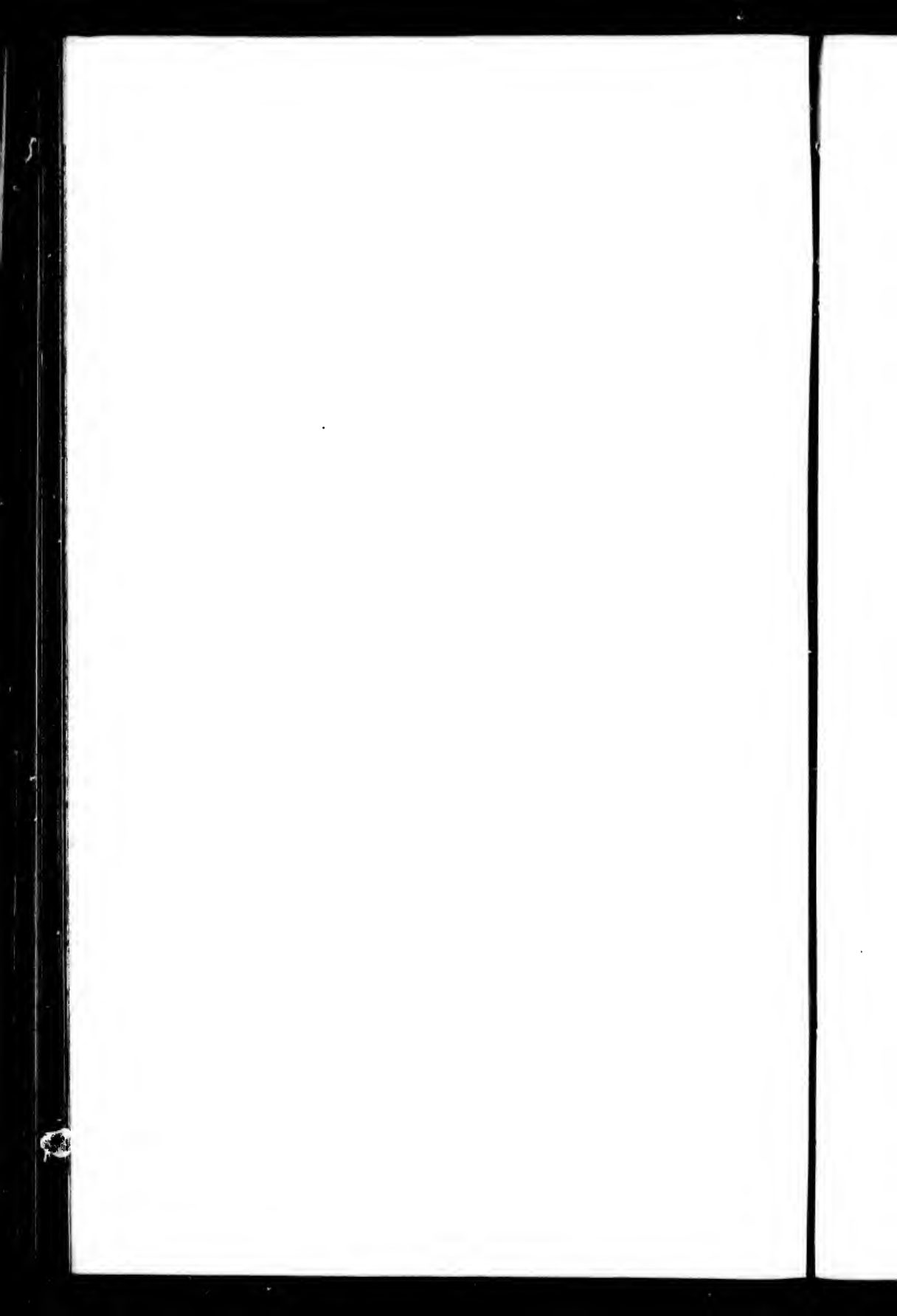
1890



Pisonia Aculeata.

Prickly Ironia

Pisona equinacea



- RHAMNUS *seu lycium*, *fngrigo 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. 2. 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 12 to 20 feet, with a diameter of 8 to 10 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 burry 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 acuminate and acute at the base, nearly opposite, $1\frac{1}{2}$ 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 towards the extremities of the branches, in rounded downy corymbs, they are small yellowish-green, furnished at the base with 2 or 3 small scale-like bractes, and have somewhat the scent of Elder flowers; the border is 5-cleft, the segments very spreading, short, oval, and acute. The stamens about 6.

The fruiting corymb becomes widely divaricate and dichotomous. The fruit is dry, club-shaped, pedunculated, having its 5 angles beset with rows of very glutinous asperities. The seeds are even, oval and oblong.

THE END.

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