

## PLATANACEÆ.

235.—*Platanus occidentalis*, Linnæus,

Spec. 1 ed. 999.—Du Roi, Harbk. ii, 134.—Marshall, Arbustum, 105.—Wangenheim, Amer. 31, t. 13, f. 31.—Walter, Fl. Caroliniana, 236.—Aiton, Hort. Kew. iii, 365; 2 ed. v, 305.—Mœnch, Meth. 358.—Abbot, Insects Georgia, ii, t. 55.—Michaux, Fl. Bor.-Am. ii, 163.—Lamarek, Dict. v, 438.—Nouveau Duhamel, ii, 6, t. 2.—Willdenow, Spec. iv, 474; Enum. 984; Berl. Baumz. 284.—Persoon, Syn. ii, 575.—Desfontaines Hist. Arb. ii, 545.—Schkuhr, Handb. iii, 274, t. 306.—Robin, Voyages, iii, 524.—Michaux f. Hist. Arb. Am. iii, 184, t. 3; N. American Sylva, 3 ed. ii, 48, t. 63.—Pursh, Fl. Am. Sept. ii, 635.—Barton, Prodr. Fl. Philadelph. 91; Compend. Fl. Philadelph. 176.—Eaton, Manual, 110; 6 ed. 267.—Nuttall, Genera, ii, 219.—Hayne, Dend. Fl. 171.—James in Long's Exped. i, 23.—Elliott, Sk. ii, 620.—Sprengel, Syst. iii, 865.—Watson, Dend. Brit. i, t. 100.—Torrey, Compend. Fl. N. States, 356; Fl. N. York, ii, 218; Bot. Mex. Boundary Survey, 205.—Audubon, Birds, t. 206.—London, Arboretum, iv, 2043, f. 1959 & t.—Eaton & Wright, Bot. 361.—Hooker, Fl. Bor.-Am. ii, 158.—Bigelow, Fl. Boston. 3 ed. 384.—Emerson, Trees Massachusetts, 227; 2 ed. i, 261 & t.—Scheele in Rœmer, Texas, 446.—Buckley in Am. Jour. Sci. 2 ser. xiii, 399.—Darlington, Fl. Cestrica, 3 ed. 282.—Darby, Bot. S. States, 509.—Agardh, Theor. & Syst. Pl. t. xiii, f. 1, 2.—Cooper in Smithsonian Rep. 1858, 254.—Hartig, Forst. 446, t. 54.—Chapman, Fl. S. States, 418.—Curtis in Rep. Geological Surv. N. Carolina, 76.—Lesquereux in Owen's 2d Rep. Arkansas, 386.—Wood, Cl. Book, 640; Bot. & Fl. 303.—Engelmann in Trans. Am. Phil. Soc. new ser. xii, 209.—A. De Candolle, Prodr. xvi<sup>2</sup>, 159.—Gray, Manual N. States, 5 ed. 447; Hall's Pl. Texas, 21.—Koch, Dendrologie, ii, 468.—Schnizlein, Icon. t. 97, f. 1-24.—Young, Bot. Texas, 498.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 121.—Vasey, Cat. Forest Trees, 22.—Ridgway in Proc. U. S. Nat. Mus. 1882, 73.—Bell in Geological Rep. Canada, 1879-'80, 55c.

*P. lobata*, Mœnch, Meth. 358.

*P. hybridas*, Brotero, Fl. Lus. ii, 487.

*P. vulgaris*, var. *angulosa*, Spach in Ann. Sci. Nat. 2 ser. xv, 293; Hist. Veg. xi, 79.

## SYCAMORE. BUTTON WOOD. BUTTON-BALL TREE. WATER BEECH.

Southern Maine and southeastern New Hampshire to northern Vermont and the northern shores of lakes Ontario and Erie, west to eastern Nebraska and Kansas, south to northern Florida, central Alabama and Mississippi, and the valley of the Nueces river, Texas, extending southwest to the valley of the Devil's river.

The largest tree of the Atlantic forests, often 30 to 40 meters in height, with a trunk 2.40 to 4.20 meters in diameter; generally along streams and river bottoms, in rich, moist soil; very common and reaching its greatest development in the bottom lands of the Ohio and Mississippi rivers; the large specimens generally hollow.

Wood heavy, hard, not strong, very close-grained, compact, difficult to split and work; layers of annual growth clearly marked by broad bands of small ducts; the numerous medullary rays very conspicuous, as in that of all the North American species; color, brown tinged with red, the sap-wood lighter; specific gravity, 0.5678; ash, 0.46; largely used for tobacco boxes (its principal use), ox-yokes, butchers' blocks, and, rarely, in the manufacture of cheap furniture.

236.—*Platanus racemosa*, Nuttall;

Audubon, Birds, t. 362; Sylva, i, 47, t. 15; 2 ed. i, 63, t. 15.—Bentham, Fl. Hartweg. 336.—Newberry in Pacific R. R. Rep. vi, 33, 89, t. 11, f. 10.—Cooper in Smithsonian Rep. 1858, 260.—Torrey, Bot. Mex. Boundary Survey, 204; Ives' Rep. 27; Bot. Wilkes Exped. 457.—A. De Candolle, Prodr. xvi<sup>2</sup>, 160.—Koch, Dendrologie, ii, 469.—Vasey, Cat. Forest Trees, 23.—Watson, Bot. California, ii, 66.

*P. occidentalis*, Hooker & Arnott, Bot. Beechey, 160, 380 [not Linnæus].

*P. Californica*, Bentham, Bot. Sulphur, 54.

*P. Mexicana*, Moricand, Pl. Rar. Amer. t. 13?—Torrey in Sitgreaves' Rep. 172; Pacific R. R. Rep. vii, 20.

## SYCAMORE. BUTTON WOOD.

California, valley of the Sacramento river, south through the interior valleys and coast ranges to the southern boundary of the state.

A large tree, 24 to 30 meters in height, with a trunk 0.90 to 1.20 meter in diameter; borders of streams, in rich soil.

Wood light, soft, not strong, very close-grained, compact, difficult to split; layers of annual growth clearly marked by narrow bands of small ducts; medullary rays numerous, conspicuous; color, light brown tinged with red, the sap-wood lighter; specific gravity, 0.4880; ash, 1.11.

237.—*Platanus Wrightii*, Watson,

Proc. Am. Acad. x, 349.—Vasey, Cat. Forest Trees, 23.—Rusby in Bull. Torrey Bot. Club, ix, 54.

*P. Mexicana*, Torrey in Emory's Rep. 151 [not Moricand].

*P. racemosa*, Watson, Pl. Wheeler, 16 [not Nuttall].—Rothrock in Wheeler's Rep. vi, 239.

## SYCAMORE.

Valleys of southwestern New Mexico to the valley of the San Pedro river, Arizona; southward into Mexico.

A tree sometimes 15 to 18 meters in height, with a trunk 0.45 to 0.60 meter in diameter; banks of streams and high mountain cañons.

Wood light, soft, weak, very close-grained, compact; layers of annual growth clearly marked by several rows of open ducts; medullary rays numerous, thin, very conspicuous; color, light brown tinged with red, the sap-wood lighter; specific gravity, 0.4736; ash, 1.35.

## JUGLANDACEÆ.

238.—*Juglans cinerea*, Linnæus,

Spec. 2 ed. 1415.—Jacquin, Icon. Rar. i, t. 193.—Wangenheim, Amer. 21, t. 9, f. 21.—Walter, Fl. Caroliniana, 235.—Aiton, Hort. Kew. iii, 361; 2 ed. v, 296.—Lamarck, Dict. iv, 503; Ill. iii, 365, t. 781, f. 7.—B. S. Barton, Coll. i, 22, 31; ii, 43.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 388.—Michaux, Fl. Bor.-Am. ii, 191.—Willdenow, Spec. iv, 456; Enum. 978; Berl. Baumz. 193.—Persoon, Syn. ii, 556.—Desfontaines, Hist. Arb. ii, 347.—Pursh, Fl. Am. Sept. ii, 636.—Barton, Prodr. Fl. Philadelph. 92.—Bigelow, Med. Bot. ii, 115, t. 32; Fl. Boston. 3 ed. 378.—Eaton, Manual, 108; 6 ed. 192.—Nuttall, Genera, ii, 220; Sylva, i, 41; 2 ed. i, 37.—Hayne, Dend. Fl. 163.—Elliott, Sk. ii, 622.—Sprengel, Syst. iii, 865.—Torrey, Compend. Fl. N. States, 357; Fl. N. York, ii, 180.—Rafinesque, Med. Bot. ii, 234.—Audubon, Birds, t. 142.—Beck, Bot. 335.—Spach, Hist. Veg. ii, 170.—Lindley, Fl. Med. 307.—London, Arboretum, iii, 1439, f. 1262.—Hooker, Fl. Bor.-Am. ii, 143.—Eaton & Wright, Bot. 287.—Emerson, Trees Massachusetts, 182; 2 ed. i, 207 & t.—Griffith, Med. Bot. 589.—Carson, Med. Bot. ii, 42, t. 86.—Parry in Owen's Rep. 618.—Darlington, Fl. Cestrica, 3 ed. 262.—Darby, Bot. S. States, 513.—Cooper in Smithsonian Rep. 1858, 254.—Chapman, Fl. S. States, 419.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 45.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 640; Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 16, t. 4, f. 45; Prodr. xvi<sup>2</sup>, 137.—Porcher, Resources S. Forests, 317.—Engelmann in Trans. Am. Phil. Soc. new ser. xii, 209.—Gray, Manual N. States, 5 ed. 447.—Koch, Dendrologie, i, 589.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 121.—Vasey, Cat. Forest Trees, 23.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Bentley & Trimen, Med. Pl. iv, 247, t. 247.—Beal in Am. Nat. xv, 36, f. 6.—Sears in Bull. Essex Inst. xiii, 178.—Bell in Geological Rep. Canada, 1878-'80, 53c.—Ridgway in Proc. U. S. Nat. Mus. 1882, 76.

*J. oblonga*, Miller, Diet. No. 3.—Du Roi, Harbk. i, 332.—Mœnch, Meth. 696.—Retzius, Obs. i, 10.

*J. oblonga alba*, Marshall, Arbustum, 67.

*J. cathartica*, Michaux f. Hist. Arb. Am. i, 165, t. 2; N. American Sylva, 3 ed. i, 109, t. 31.

*Carya cathartica*, Barton, Compend. Fl. Philadelph. ii, 178.

*Wallia cinerea*, Alefeld in Bonplandia, 1861, 334.

## BUTTERNUT. WHITE WALNUT.

Southern New Brunswick, valley of the Saint Lawrence river, Ontario and southern Michigan to northern Minnesota (lake Pokegoma, *Garrison*) and central Iowa, south to Delaware and along the Alleghany mountains to northern Georgia, central Alabama and Mississippi, northern Arkansas, and southeastern Kansas.

A tree 18 to 24 or, exceptionally, 30 to 35 meters (*Ridgway*) in height, with a trunk 0.60 to 0.90 meter in diameter; rich woodlands; rare at the south; most common and reaching its greatest development in the Ohio River basin.

Wood light, soft, not strong, rather coarse-grained, compact, easily worked, satiny, susceptible of a beautiful polish, containing numerous regularly-distributed, large, open ducts; medullary rays distant, thin, obscure; color, bright light brown, turning dark with exposure, the sap-wood lighter; specific gravity, 0.4086; ash, 0.51; largely used for interior finish, cabinet work, etc.

The inner bark, especially that of the root, is employed medicinally as a mild cathartic (*Am. Jour. Pharm.* 1874, 169.—*U. S. Dispensatory*, 14 ed. 526.—*Nat. Dispensatory*, 2 ed. 794), and furnishes a yellow dye.

239.—*Juglans nigra*, Linnaeus,

Spec. 1 ed. 997.—Jacquin, Icon. Rar. i, t. 191.—Wangenheim, Amer. 20, t. 8, f. 20.—Walter, Fl. Caroliniana, 235.—Aiton, Hort. Kew, iii, 360; 2 ed. v, 296.—Mönch, Meth. 696.—Lamarck, Diet. iv, 502; Ill. iii, 365, t. 781, f. 6.—Abbot, Insects Georgia, i, t. 83.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 338.—Michaux, Fl. Bor.-Am. ii, 191.—Willdenow, Spec. iv, 456; Enum. 978; Berl. Baumz. 193.—Smith in Rees' Cycl. xx, No. 3.—Persoon, Syn. ii, 566.—Desfontaines, Hist. Arb. ii, 347.—Nouveau Duhamel, iv, 179, t. 48.—Michaux f. Hist. Arb. Am. i, 158, t. 1; N. American Sylva, 3 ed. i, 140, t. 30.—Pursh, Fl. Am. Sept. ii, 636.—Barton, Prodr. Fl. Philadelph. 92; Compend. Fl. Philadelph. ii, 177.—Eaton, Manual, 108; 6 ed. 192.—Nuttall, Genera, ii, 220; Sylva, i, 41; 2 ed. i, 57.—Hayne, Dend. Fl. 163.—Elliott, Sk. ii, 622.—Sprengel, Syst. iii, 865.—Torrey, Compend. Fl. N. States, 357; Fl. N. York, ii, 179.—Watson, Dend. Brit. ii, t. 158.—Audubon, Birds, t. 84, 156.—Rafinesque, Med. Bot. ii, 233.—Beck, Bot. 335.—Spach, Hist. Veg. ii, 168.—Loudon, Arboretum, iii, 1435, f. 1260 & t.—Eaton & Wright, Bot. 237.—Emerson, Trees Massachusetts, 185; 2 ed. i, 211 & t.—Griffith, Med. Bot. 589.—Parry in Owen's Rep. 618.—Darlington, Fl. Cestrica, 3 ed. 262.—Darby, Bot. S. States, 513.—Cooper in Smithsonian Rep. 1858, 254.—Chapman, Fl. S. States, 419.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 45.—Lesqueroux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 640; Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 34, t. 1, f. 1, 8-10; Prodr. xvi<sup>2</sup>, 137.—Engelmann in Trans. Am. Phil. Soc. new ser. xii, 209.—Porcher, Resources S. Forests, 318.—Gray, Manual N. States, 5 ed. 447.—Koch, Dendrologie, i, 587.—Schnizlein, Icon. t. 244, f. 1, 8, 12, 13.—Young, Bot. Texas, 500.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 121.—Vasey, Cat. Forest Trees, 23.—Guibourt, Hist. Drogues, 7 ed. ii, 302.—Beal in Am. Nat. xv, 36, f. 5.—Sears in Bull. Essex Inst. xiii, 178.—Bell in Geological Rep. Canada, 1879-'80, 53.—Ridgway in Proc. U. S. Nat. Mus. 1882, 76.—Nicholson in London Gard. Chronicle, 1882, 780.—Watson in Proc. Am. Acad. xviii, 155.

*J. nigra oblonga*, Marshall, Arbustum, 67.

*Wallia nigra*, Alefeld in Bonplandia, 1861, 334.

## BLACK WALNUT.

Western Massachusetts, west along the southern shores of lake Erie through southern Michigan to southern Minnesota, eastern Nebraska, and eastern Kansas, south to the Chattahoochee region of northern Florida, central Alabama and Mississippi, and the valley of the San Antonio river, Texas.

A large tree, often 30 to 45 meters in height, with a trunk 1.80 to 3 meters in diameter; rich bottom lands and hillsides; most common and reaching its greatest development on the western slopes of the southern Alleghany mountains and in the rich bottoms of southwestern Arkansas and the Indian territory; less common east of the Alleghany mountains, and now everywhere scarce.

Wood heavy, hard, strong, rather coarse-grained, liable to check if not carefully seasoned, easily worked, susceptible of a beautiful polish, durable in contact with the soil, containing numerous large, regularly-distributed, open ducts; medullary rays numerous, thin, not conspicuous; color, rich dark brown, the thin sap-wood much lighter; specific gravity, 0.6115; ash, 0.79; more generally used in cabinet-making, interior finish, and for gun stocks than that of any other North American tree.

240.—*Juglans rupestris*, Engelmann;

Sitgreaves' Rep. 171, t. 15.—Torrey, Bot. Mex. Boundary Survey, 205; Ives' Rep. 27.—Cooper in Smithsonian Rep. 1858, 260.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 28, t. 2, f. 11; Prodr. xvi<sup>2</sup>, 138.—Vasey, Cat. Forest Trees, 24.—Watson, Bot. California, ii, 93; Proc. Am. Acad. xviii, 155.—Rusby in Bull. Torrey Bot. Club. ix, 54.

*J. rupestris*, var. *major*, Torrey in Sitgreaves' Rep. 171, t. 16; Bot. Mex. Boundary Survey, 205; Pacific R. R. Rep. vii, 20.—C. De Candolle, Prodr. xvi<sup>2</sup>, 138.—Hemsley, Bot. Am.-Cent. iii, 164.

*J. Californica*, Watson in Proc. Am. Acad. x, 349; Bot. California, ii, 93.—Vasey, Cat. Forest Trees, 24.—Rothrock in Wheeler's Rep. vi, 249.

## WALNUT.

Valley of the Colorado river (near Austin), west through western Texas, southern New Mexico, and Arizona from 5,000 to 7,000 feet elevation, and in the California Coast ranges from the San Bernardino mountains to the neighborhood of San Francisco bay and the valley of the Sacramento river.

A tree rarely 15 to 22 meters in height, with a trunk 0.30 to 0.90 meter in diameter, reaching its greatest development in the neighborhood of San Francisco bay; in Texas generally reduced to a low, much-branched shrub; borders of streams and mountain cañons, in rich soil.

Wood heavy, hard, not strong, coarse-grained, checking in drying, susceptible of a good polish, containing numerous regularly-distributed, large, open ducts; medullary rays distant, thin, obscure; color, rich dark brown, the sap-wood lighter; specific gravity, 0.6554; ash, 1.01.

The small nuts sweet and edible.

241.—*Carya olivæformis*, Nuttall,

Genera, ii, 221.—Sprengel, Syst. ii, 849.—Eaton, Manual, 6 ed. 83.—Spach, Hist. Veg. ii, 173.—Penn. Cycl. vi, 331.—London, Arboretum, iii, 1441, f. 1263.—Eaton & Wright, Bot. 183.—Scheele in Roemer, Texas, 447.—Belg. Hort. vi, 223, t. 45, f. 2.—Torrey, Bot. Mex. Boundary Survey 205.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 418.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 641; Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 36, t. 1, f. 3, t. 5, f. 59; Prodr. xvi<sup>2</sup>, 144.—Porcher, Resources S. Forests, 333.—Gray, Manual N. States, 5 ed. 448.—Young, Bot. Texas, 499.—Vasey, Cat. Forest Trees, 24.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Ridgway in Proc. U. S. Nat. Mus. 1882, 77.—Hemsley, Bot. Am.-Cent. iii, 163.—Watson in Proc. Am. Acad. xviii, 155.

*Juglans Pecan*, Marshall, Arbustum, 69.—Walter, Fl. Caroliniana, 236.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 392.

*Juglans Illinoensis*, Wangenheim, Amer. 54, t. 18, f. 43.

*Juglans angustifolia*, Aiton, Hort. Kew. iii, 361; 2 ed. v, 296.

*Juglans rubra*, Gärtner, Fruct. ii, 51, t. 89, f. 1.—Lamarck, Ill. iii, 365, t. 781, f. 4.

*Juglans cylindrica*, Lamarck, Dict. iv, 505; Ill. iii, 365, t. 781, f. 5.—Nouveau Duhamel, iv, 179.

*Juglans olivæformis*, Michaux, Fl. Bor.-Am. ii, 192.—Willdenow, Spec. iv, 457; Enum. 979; Berl. Baumz. 194.—Persoon, Syn. ii, 566.—Desfontaines, Hist. Arb. ii, 348.—Michaux f. Hist. Arb. Am. i, 175, t. 3; N. American Sylva, 3 ed. i, 114, t. 32.—Muhlenberg, Cat. 88.—Aiton, Hort. Kew. 2 ed. v, 296.—Pursh, Fl. Am. Sept. ii, 636.—Hayne, Dend. Fl. 163.—Regel, Gartenflora, xviii, 89.

*C. angustifolia*, Nuttall, Sylva, i, 41; 2 ed. i, 57.

?*C. tetraptera*, Liebmann in Dansk. Vidensk. Selsk. Forhand. 1850, 80.

*Hickorea* species, LeConte in Proc. Philadelphia Acad. vi, 402.

*C. Illinoensis*, Koch, Dendrologie, i, 593.

## PECAN. ILLINOIS NUT.

Near Davenport, Iowa (*C. C. Parry*), southern Illinois, and Indiana, northwestern Kentucky, south and southwest through Missouri and Arkansas to eastern Kansas, the Indian territory, and through western Louisiana and Texas to the valley of the Coucho river.

A tree 30 to 52 meters in height, with a trunk 0.90 to 1.80 meter in diameter; borders of streams in low, rich soil; very common and reaching its greatest development in the bottom lands of Arkansas and the Indian territory; the largest species of the genus and the largest and most important tree of western Texas.

Wood heavy, hard, not strong, brittle, close-grained, compact; layers of annual growth marked by one or two rows of large open ducts; medullary rays numerous, thin; color, light brown tinged with red; the sap-wood lighter brown; specific gravity, 0.7180; ash, 1.13; less valuable than the wood of the other species and hardly used except for fuel.

The sweet, edible nuts are collected in great quantities, affording an important article of commerce.

242.—*Carya alba*, Nuttall,

Genera, ii, 221.—Elliott, Sk. ii, 624.—Watson, Dend. Brit. ii, t. 148.—Sprengel, Syst. ii, 849.—Torrey, Compend. Fl. N. States, 357; Fl. N. York, 181.—Beck, Bot. 336.—Eaton, Manual, 6 ed. 83.—Spach, Hist. Veg. ii, 174.—Penn. Cycl. vi, 332.—London, Arboretum, iii, 1446, f. 1269 & t.—Eaton & Wright, Bot. 183.—Hooker, Fl. Bor.-Am. ii, 143.—Emerson, Trees Massachusetts, 191; 2 ed. i, 217 & t.—Darlington, Fl. Cestrica, 3 ed. 263.—Darby, Bot. S. States, 513.—Belg. Hort. vi, 223, t. 48, f. 8.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 418.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 43.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 641; Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 36, t. 2, f. 13, 14, 18, t. 3, f. 24, t. 4, f. 44, 46; Prodr. xvi<sup>2</sup>, 142.—Gray, Manual N. States, 5 ed. 448.—Young, Bot. Texas, 499.—Vasey, Cat. Forest Trees, 24.—Aldrich in Am. Nat. xv, 227.—Sears in Bull. Essex Inst. xiii, 179.—Ridgway in Proc. U. S. Nat. Mus. 1882, 72.—Bell in Geological Rep. Canada, 1879-'80, 55<sup>c</sup>.

*Juglans ovata*, Miller, Dict.

*Juglans alba ovata*, Marshall, Arbustum, 69.

*Juglans ovalis*, Wangenheim, Amer. 24, t. 10, f. 23.

*Juglans compressa*, Gärtner, Fruct. ii, 50, t. 89, f. 1.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 300.—Willdenow, Spec. iv, 458; Enum. 979; Berl. Baumz. 195.—Persoon, Syn. ii, 566.—Desfontaines, Hist. Arb. ii, 347.—Aiton, Hort. Kew. 2 ed. v, 297.—Hayne, Dend. Fl. 164.—Lamarck, Ill. iii, 365, t. 781, f. 3.

?*Juglans exaltata*, Bartram, Travels, 2 ed. 38.

*Juglans squamosa*, Lamarck, Dict. iv, 504.—Desfontaines, Hist. Arb. ii, 348.—Michaux f. Hist. Arb. Am. i, 190, t. 7; N. American Sylva, 3 ed. i, 123, t. 36.—Barton, Prodr. Fl. Philadelph. 92; Compend. Fl. Philadelph. ii, 179.—Bigelow, Fl. Boston. 3 ed. 380.

*Juglans alba*, Michaux, Fl. Bor. Am. ii 193 [not Linnæus].—Pursh, Fl. Am. Sept. ii, 637.—Eaton, Manual, 108.

*C. microcarpa*, Nuttall, Genera, ii, 221; Sylva, i, 38, t. 13; 2 ed. i, 55, t. 13.—Sprengel, Syst. ii, 849.—Penn. Cycl. vi, 332.—London, Arboretum, iii, 1451.—Darlington, Fl. Cestrica, 3 ed. 264.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 419.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 44.—Wood, Cl. Book, 642; Bot. & Fl. 304.—C. De Candolle, Prodr. xvi<sup>2</sup>, 143.—Gray, Manual N. States, 5 ed. 448.—Koch, Dendrologie, i, 596.—Young, Bot. Texas, 499.—Vasey, Cat. Forest Trees, 24.—Ridgway in Proc. U. S. Nat. Mus. 1882, 77.

## SHELL-BARK HICKORY. SHAG-BARK HICKORY.

Valley of the Saint Lawrence river, along the northern shores of lakes Ontario and Erie to southern Michigan and southeastern Minnesota, south to the Chattahoochee region of western Florida, central Alabama and Mississippi, and west to eastern Kansas, the Indian territory, and eastern Texas.

A large tree of the first economic value, 24 to 30 or, exceptionally, 30 to 45 meters in height (*Ridgway*), with a trunk 0.90 to 1.20 meter in diameter; rich hillsides and sandy ridges; common and reaching its greatest development west of the Alleghany mountains; varying greatly in the size and shape of the fruit. A form with small, thin-shelled nuts (*C. microcarpa*, Nuttall l. c.) is not rare from Delaware southward, and in Michigan.

Wood heavy, very hard and strong, tough, close-grained, compact, flexible; layers of annual growth clearly marked with one to three rows of large open ducts; medullary rays numerous, thin; color, brown, the thin and more valuable sap-wood nearly white; specific gravity, 0.8372; ash, 0.73; largely used in the manufacture of agricultural implements, carriages, ax handles, baskets, etc.

The sweet and edible nuts afford an important article of commerce.

243.—*Carya sulcata*, Nuttall,

Genera, ii, 221.—Elliott, Sk. ii, 624.—Sprengel, Syst. ii, 849.—Torrey, Compend. Fl. N. States, 357.—Beck, Bot. 336.—Eaton, Manual, 6 ed. 83.—Spach, Hist. Veg. ii, 174.—Penn. Cycl. vi, 332.—London, Arboretum, iii, 1448, f. 1271.—Eaton & Wright, Bot. 183.—Darby, Bot. S. States, 513.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 418.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 43.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 641; Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 36, t. 5, f. 51, 52; Prodr. xvi<sup>2</sup>, 143.—Gray, Manual N. States, 5 ed. 449.—Young, Bot. Texas, 499.—Vasey, Cat. Forest Trees, 24.—Ridgway in Proc. U. S. Nat. Mus. 1882, 78.

*Juglans sulcata*, Willdenow, Berl. Baumz. 1 ed. 154, t. 7; Spec. iv, 457.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 391.—Persoon, Syn. ii, 566.—Desfontaines, Hist. Arb. ii, 348.—Pursh, Fl. Am. Sept. ii, 637.

*Juglans mucronata*, Michaux, Fl. Bor.-Am. ii, 192.

*Juglans laciniosa*, Michaux f. Hist. Arb. Am. i, 199, t. 8; N. American Sylva, 3 ed. i, 128, t. 37.—Barton, Prodr. Fl. Philadelph. 92.—Poirot, Suppl. iv, 112.—Audubon, Birds, t. 101.

*C. cordiformis*, Koch, Dendrologie, i, 597.

## BIG SHELL-BARK. BOTTOM SHELL-BARK.

Chester county, Pennsylvania, west to southern Indiana and Illinois, eastern Kansas, and the Indian territory.

A tree 24 to 30 or, exceptionally, 37 (*Ridgway*) meters in height, with a trunk 0.60 to 1.20 meter in diameter; bottom lands, in low, rich soil; rare and local; most common and reaching its greatest development along the streams of southern Arkansas and the Indian territory.

Wood heavy, very hard, strong and tough, very close-grained, compact, flexible; layers of annual growth marked by one or two rows of large open ducts; medullary rays numerous, obscure; color, dark brown, the sap-wood nearly white; specific gravity, 0.8108; ash, 0.90; used for the same purposes as that of the shell-bark hickory.

The large nuts sweet and edible.

244.—*Carya tomentosa*, Nuttall,

Genera, ii, 221.—Barton, Compend. Fl. Philadelph. ii, 179.—Elliott, Sk. ii, 625.—Sprengel, Syst. ii, 849.—Torrey, Compend. Fl. N. States, 357; Fl. N. York, ii, 182.—Beck, Bot. 336.—Eaton, Manual, 6 ed. 83.—Spach, Hist. Veg. ii, 176.—Penn. Cycl. vi, 332.—London, Arboretum, iii, 1444, f. 1267.—Eaton & Wright, Bot. 183.—Emerson, Trees Massachusetts, 194, t. 13; 2 ed. i, 222 & t.—Darlington, Fl. Cestrica, 3 ed. 263.—Darby, Bot. S. States, 513.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 419.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 43.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 641; Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 36; Prodr. xvi<sup>2</sup>, 143.—Gray, Manual N. States, 5 ed. 449.—Young, Bot. Texas, 499.—Vasey, Cat. Forest Trees, 24.—Ridgway in Proc. U. S. Nat. Mus. 1882, 78.

*Juglans alba*, Linnæus, Spec. 1 ed. 997.—Du Roi, Harbk. i, 333.—Kalm in Act. Holm. 1769, 117.—Wangenheim, Amer. 23, t. 10, f. 2.—Walter, Fl. Caroliniana, 235.—Aiton, Hort. Kew. iii, 360; 2 ed. v, 296.—Gærtner, Fruct. ii, 50, t. 89, f. 1.—Mench, Meth. 696.—Abbot, Insects Georgia, i, t. 29.—Lamarck, Dict. iv, 503; Ill. iii, 364, t. 781, f. 2.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 389.—Smith in Rees' Cycl. xx, No. 2.—Willdenow, Spec. iv, 457; Berl. Baumz. 154.—Desfontaines, Hist. Arb. ii, 347.—Bigelow, Fl. Boston. 3 ed. 379.

*Juglans tomentosa*, Lamarek, Dict. iv, 504.—Michaux, Fl. Bor.-Am. ii, 192.—Michaux f. Hist. Arb. Am. i, 184, t. 6; N. American Sylva, 3 ed. i, 120, t. 35.—Pursh, Fl. Am. Sept. ii, 637.—Barton, Prodr. Fl. Philadelph. 92.

*C. tomentosa*, var. *maxima*, Nuttall, Genera, ii, 221; Sylva, i, 40; 2 ed. i, 56.—Sweet, Hort. Brit. ed. 1830.—Beck, Bot. 336.—Loudon, Arboretum, iii, 1445.—C. De Candolle, Prodr. xvi<sup>2</sup>, 143.

*C. alba*, Koch, Dendrologie, i, 596 [not Nuttall].

MOCKER NUT. BLACK HICKORY. BULL NUT. BIG-BUD HICKORY. WHITE-HEART HICKORY. KING NUT.

Valley of the Saint Lawrence river, northern shores of lakes Ontario and Erie to eastern Nebraska, eastern Kansas, and the Indian territory, south to cape Canaveral and Tampa bay, Florida, and the valley of the Brazos river, Texas.

A tree 24 to 30 or, exceptionally, 33 (*Ridgway*) meters in height, with a trunk 0.90 to 1.20 meter in diameter; generally on rich upland hillsides—less commonly in low river bottom lands; very common in the Gulf states, and throughout the south the most widely-distributed species of the genus.

Wood heavy, very hard, strong, tough, very close-grained, checking in drying, flexible, containing few large, regularly-distributed, open ducts; medullary rays numerous, thin, obscure; color, rich dark brown, the thick sap-wood nearly white; specific gravity, 0.8216; ash, 1.06; used for the same purposes as that of the shell-bark hickory.

#### 245.—*Carya porcina*, Nuttall,

Genera, ii, 222.—Barton, Compend. Fl. Philadelph. ii, 180.—Elliott, Sk. ii, 627.—Watson, Dend. Brit. ii, t. 167.—Sprengel, Syst. ii, 849.—Torrey, Compend. Fl. N. States, 358.—Beck, Bot. 336.—Eaton, Manual, 6 ed. 83.—Spach, Hist. Veg. ii, 178.—Penn. Cycl. vi, 332.—Darlington, Fl. Cestrica, 2 ed. 546.—Loudon, Arboretum, iii, 1449, f. 1272–1274.—Eaton & Wright, Bot. 183.—Spach, Hist. Veg. ii, 178.—Emerson, Trees Massachusetts, 197, t. 14; 2 ed. i, 224 & t.—Wood, Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 36, t. 1, f. 5, t. 5, f. 54; Prodr. xvi<sup>2</sup>, 143.—Porcher, Resources S. Forests, 332.—Gray, Manual N. States, 5 ed. 449; Hall's Pl. Texas, 21.—Vasey, Cat. Forest Trees, 24.—Ridgway in Proc. U. S. Nat. Mus. 1882, 78.

*Juglans glabra*, Miller, Dict. No. 5.—Wangenheim, Amer. 25, t. 10, f. 24.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 391.—Willdenow, Spec. iv, 458; Berl. Baumz. 196.—Persoon, Syn. ii, 566.—Aiton, Hort. Kew. 2 ed. v, 297.—Eaton, Manual, 108.—Hayne, Dend. Fl. 164.

*Juglans alba acuminata*, Marshall, Arbustum, 68.

*Juglans obcordata*, Lamarek Dict. iv, 504.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 391.—Willdenow, Spec. iv, 458.—Persoon, Syn. 566.

*Juglans porcina*, Michaux f. Hist. Arb. Am. i, 206, t. 9; N. American Sylva, 3 ed. i, 132, t. 38.—Pursh, Fl. Am. Sept. ii, 638.—Barton, Prodr. Fl. Philadelph. 92.—Audubon, Birds, t. 91.

*Juglans pyriformis*, Muhlenberg, Cat. 92.

*Juglans porcina*, var. *obcordata*, Pursh, Fl. Am. Sept. ii, 638.—Barton, Compend. Fl. Philadelph. ii, 180.—Watson, Dend. Brit. ii, 167.

*Juglans porcina*, var. *pisiformis*, Pursh, Fl. Am. Sept. ii, 638.—Barton, Compend. Fl. Philadelph. ii, 180.

*C. glabra*, Torrey, Fl. N. York, ii, 182, t. 101.—Gray, Manual N. States, 1 ed. 412.—Darlington, Fl. Cestrica, 3 ed. 264.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 419.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 44.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Koch, Dendrologie, i, 594.—Young, Bot. Texas, 499.

*C. amara*, var. *porcina*, Darby, Bot. S. States, 513.

PIG NUT. BROWN HICKORY. BLACK HICKORY. SWITCH-BUD HICKORY.

Southern Maine to southern Ontario, southern Michigan and Minnesota, eastern Nebraska, eastern Kansas, and the Indian territory, south to cape Canaveral and Pease creek, Florida, and the valley of the Nueces river, Texas.

A tree 24 to 30 or, exceptionally, 40 (*Ridgway*) meters in height, with a trunk 0.90 to 1.50 meter in diameter; dry hills and uplands; common.

Wood heavy, hard, very strong and tough, flexible, close-grained, checking in drying, containing many large open ducts; color, dark or light brown, the thick sap-wood lighter, often nearly white; specific gravity, 0.8217; ash, 0.99; used for the same purposes as that of the shell-bark hickory.

246.—*Carya amara*, Nuttall,

Genera, ii, 222.—Barton, Compend. Fl. Philadelph. ii, 180.—Elliott, Sk. ii, 626.—Sprengel, Syst. ii, 849.—Torrey, Compend. Fl. N. States, 358; Fl. N. York, ii, 183.—Beck, Bot. 336.—Spach, Hist. Veg. ii, 177.—Penn. Cycl. vi, 332.—Loudon, Arboretum, iii, 1443, f. 1264.—Hooker, Fl. Bor.-Am. ii, 144.—Emerson, Trees Massachusetts, 199, t. 15; 2 ed. i, 226 & t.—Darlington, Fl. Cestrica, 3 ed. 264.—Darby, Bot. S. States, 513.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 419.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 44.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 641; Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 36, t. 1, f. 2, t. 5, f. 53-55; Prodr. xvi<sup>2</sup>, 144.—Gray, Manual N. States, 5 ed. 449; Hall's Pl. Texas, 21.—Koch, Dendrologie, i, 592.—Young, Bot. Texas, 500.—Vasey, Cat. Forest Trees, 24.—Sears in Bull. Essex Inst. xiii, 178.—Bell in Geological Rep. Canada, 1879-'80, 52c.—Ridgway in Proc. U. S. Nat. Mus. 1882, 77.

*Juglans alba minima*, Marshall, Arbustum, 68.

*Juglans cordiformis*, Wangenheim, Amer. 25, t. 10, f. 25.

*Juglans angustifolia*, Lamarck, Dict. iv, 504 [not Aiton].

*Juglans amara*, Michaux f. Hist. Arb. Am. i, 177, t. 4; 3 ed. i, 116, t. 33.—Pursh, Fl. Am. Sept. ii, 638.

*Hickorius amara*, Rafinesque, Fl. Ludoviciana, 109.

## BITTER NUT. SWAMP HICKORY.

Southern Maine to the valley of the Saint Lawrence river, west through Ontario, central Michigan and Minnesota to eastern Nebraska, eastern Kansas, and the Indian territory, south to the Chattahoochee region of western Florida and the valley of the Trinity river, Texas.

A tree 18 to 24 meters in height, with a trunk 0.60 to 0.90 meter in diameter; borders of streams and swamps, in low ground, or often on dry, rich uplands.

Wood heavy, very hard, strong, tough, close-grained, checking in drying; layers of annual growth marked by several rows of large open ducts; medullary rays numerous, obscure; color, dark brown, the thick sap-wood light brown, or often nearly white; specific gravity, 0.7552; ash, 1.03; largely used for hoops, ox-yokes, etc.

247.—*Carya myristicæformis*, Nuttall,

Genera, ii, 222.—Elliott, Sk. ii, 626.—Sprengel, Syst. ii, 849.—Eaton, Manual, 6 ed. 83.—Spach, Hist. Veg. ii, 179.—Penn. Cycl. v, 332.—Loudon, Arboretum, iii, 1451, f. 1275.—Eaton & Wright, Bot. 1833.—Chapman, Fl. S. States, 419.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 36, t. 6, f. 58; Prodr. xvi<sup>2</sup>, 145.—Koch, Dendrologie, i, 595.—Young, Bot. Texas, 500.—Vasey, Cat. Forest Trees, 24.—Ravenel in Bull. Torrey Bot. Club, vi, 81.

*Juglans myristicæformis*, Michaux f. Hist. Arb. Am. i, 211, t. 10; N. American Sylva, 3 ed. i, 135, t. 39.—Pursh, Fl. Am. Sept. ii, 638.—Poiret, Suppl. iv, 112.—Rafinesque, Fl. Ludoviciana, 161.

*C. amara*, var. *myristicæformis*, Cooper in Smithsonian Rep. 1858, 255.

## NUTMEG HICKORY.

South Carolina, "Goose creek" (*Michaux*), "Berkeley district" (*Ravenel*); Arkansas, valley of the Arkansas river (Pine Bluff, *Letterman*), south to the Red River valley.

A tree 24 to 30 meters in height, with a trunk 0.60 to 0.90 meter in diameter; sandy ridges along the borders of streams and swamps; rare and very local in South Carolina; more common and reaching its greatest development in southern Arkansas.

Wood heavy, hard, very strong and tough, close-grained, compact, containing numerous small open ducts, layers of annual growth marked by one or two rows of larger ducts; medullary rays numerous, thin, not conspicuous; color, light brown, the sap-wood lighter; specific gravity, 0.8016; ash, 1.06.

248.—*Carya aquatica*, Nuttall,

Genera, ii, 222.—Elliott, Sk. ii, 627.—Sprengel, Syst. ii, 849.—Eaton, Manual, 6 ed. 83.—Spach, Hist. Veg. ii, 179.—Penn. Cycl. vi, 332.—Loudon, Arboretum, iii, 1444, f. 1265, 1266.—Eaton & Wright, Bot. 1833.—Scheele in Roemer, Texas, 447.—Darby, Bot. S. States, 514.—Chapman, Fl. S. States, 419.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 44.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 641; Bot. & Fl. 304.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 36, t. 1, f. 4, t. 5, f. 56, 57; Prodr. xvi<sup>2</sup>, 144.—Koch, Dendrologie, i, 593.—Young, Bot. Texas, 500.—Vasey, Cat. Forest Trees, 24.

*Juglans aquatica*, Michaux f. Hist. Arb. Am. i, 182, t. 5; N. American Sylva, 3 ed. i, 119, t. 34.—Pursh, Fl. Am. Sept. ii, 638.—Poiret, Suppl. iv, 112.

*Hicorius integrifolia*, Rafinesque, Fl. Ludoviciana, 109.

*C. integrifolia*, Sprengel, Syst. ii, 849.—Loudon, Arboretum, iii, 1451.

## WATER HICKORY. SWAMP HICKORY. BITTER PECAN.

North Carolina, in the lower districts, south to cape Malabar and the Caloosa river, Florida (in Florida not detected within 8 or 10 miles of the coast), through the Gulf states to western Louisiana, northeastern Arkansas, and the valley of the Brazos river, Texas.

A tree 18 to 21 meters in height, with a trunk 0.60 to 0.90 meter in diameter, or generally much smaller; low river swamps; most common and reaching its greatest development in the bottom lands of the lower Mississippi and Yazoo rivers.

Wood heavy, soft, strong, rather brittle, very close-grained, compact, containing few scattered, open ducts; layers of annual growth less clearly marked than in the other species of the genus; medullary rays numerous, thin; color, dark brown, the sap-wood light, often nearly white; specific gravity, 0.7407; ash, 1.27; used for fencing, fuel, etc.

## MYRICACEÆ.

249.—*Myrica cerifera*, Linnæus,

*Spec.* 1 ed. 1024.—Kalm, Travels, English ed. i, 92.—Marshall, Arbustum, 94.—Lamarek, Dict. ii, 592; III. iii, 402, t. 809, f. 1.—Gartner, Fruct. i, 190, t. 39, f. 7.—Walter, Fl. Caroliniana, 242.—Aiton, Hort. Kew. iii, 396; 2 ed. v, 379.—Mönch, Meth. 362.—B. S. Barton, Coll. ii, 4.—Nouveau Duhamel, ii, 190.—Schkuhr, Handb. iii, 465, t. 322.—Michaux, Fl. Bor.-Am. ii, 227.—Willdenow, Spec. iv, 745; Enum. 1011; Berl. Baumz. 254.—Persoon, Syn. ii, 614.—Desfontaines, Hist. Arb. ii, 472.—Titford, Hort. Bot. Am. 100.—Pursh, Fl. Am. Sept. ii, 620.—Nuttall, Genera, ii, 235; Trans. Am. Phil. Soc. 2 ser. v, 167.—Bigelow, Med. Bot. iii, 32, t. 43; Fl. Boston. 3 ed. 394.—Hayne, Dend. Fl. 197.—Elliott, Sk. ii, 678.—Sprengel, Syst. i, 493.—Torrey, Compend. Fl. N. States, 372; Fl. N. York, ii, 197.—Rafinesque, Med. Bot. ii, 244.—Eaton, Manual, 6 ed. 231.—Beck, Bot. 324.—Loudon, Arboretum, iv, 2057, f. 1968.—Lindley, Fl. Med. 305.—Dietrich, Syn. i, 551.—Eaton & Wright, Bot. 324.—Spach, Hist. Veg. xi, 263.—Emerson, Trees Massachusetts, 224; 2 ed. i, 256 & t.—Darby, Bot. S. States, 507.—Chapman, Fl. S. States, 426.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 106.—Lesquereux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 650; Bot. & Fl. 309.—Poreher, Resources S. Forests, 312.—C. De Candolle in Ann. Sci. Nat. 4 ser. xviii, 21, t. 3, f. 32; Prodr. xvi<sup>2</sup>, 148.—Lawson in Trans. Bot. Soc. Edinburgh, viii, 108.—Gray, Manual N. States, 5 ed. 457.—Koech, Dendrologie, ii, 663.—Young, Bot. Texas, 511.—Vasey, Cat. Forest Trees, 28.

*M. Pennsylvanica*, Lamarek, Dict. ii, 592.—Desfontaines, Hist. Arb. ii, 472.—Nouveau Duhamel, ii, 190, t. 55.—Pursh, Fl. Am. Sept. ii, 620.—Sprengel, Syst. i, 493.—Eaton, Manual, 6 ed. 232.—Eaton & Wright, Bot. 325.—Spach, Hist. Veg. xi, 262.

*M. Carolinensis*, Miller, Dict. No. 3.—Wangenheim, Amer. 102.—Willdenow, Spec. iv, 746; Enum. 1011.—Aiton, Hort. Kew. 2 ed. v, 379.—Pursh, Fl. Am. Sept. ii, 620.—Nuttall, Genera, ii, 235.—Elliott, Sk. ii, 678.—Eaton, Manual, 6 ed. 232.—Eaton & Wright, Bot. 324.—Darby, Bot. S. States, 507.

*M. cerifera humilis*, Marshall, Arbustum, 95.

*M. cerifera*, var. *latifolia*, Aiton, Hort. Kew. iii, 396.

*M. cerifera*, var. *media*, Michaux, Fl. Bor.-Am. ii, 227.—Chapman, Fl. S. States, 427.

*M. cerifera*, var. *arborescens*, Michaux, Fl. Bor.-Am. ii, 227.

*M. cerifera*, var. *pumila*, Michaux, Fl. Bor.-Am. ii, 227.—Pursh, Fl. Am. Sept. ii, 620.—Chapman, Fl. S. States, 427.

*M. cerifera*, var. *angustifolia*, C. De Candolle, Prodr. xvi<sup>2</sup>, 148.

*M. cerifera sempervirens*, Hort.

## BAYBERRY. WAX MYRTLE.

Shores of lake Erie; Maine, and south near the coast to the Florida keys and southern Alabama.

A tree sometimes 12 meters in height, with a trunk 0.30 to 0.45 meter in diameter, or, except in the southern states, a low, much-branched shrub; usually on sandy beaches and dry hillsides, reaching its greatest development in the bottoms and rich hummocks of the Georgia and Florida coasts.

Wood light, soft, strong, brittle, very close-grained, compact; medullary rays numerous, thin; color, dark brown, the sap-wood lighter; specific gravity, 0.5637; ash, 0.51.

The leaves and stimulant and astringent bark of the roots sometimes employed by herbalists (*Am. Jour. Pharm.* 1863, 193.—*U. S. Dispensatory*, 14 ed. 257, 1706.—*Nat. Dispensatory*, 2 ed. 944). The wax which covers the small globular fruit, formerly largely collected and made into candles, and now, under the name of myrtle-wax, a popular remedy in the treatment of dysentery.

250.—*Myrica Californica*, Chamisso,

Linnaea, vi, 535.—Bentham, Pl. Hartweg, 336; Bot. Sulphur, 55.—Hooker, Fl. Bor.-Am. ii, 160.—Hooker & Arnott, Bot. Beechey, 390.—Lindley in Jour. London Hort. Soc. vii, 282.—Torrey in Pacific R. R. Rep. iv, 137; Bot. Wilkes Exped. 465.—Newberry in Pacific R. R. Rep. vi, 89.—Cooper in Pacific R. R. Rep. xii, 68.—C. De Candolle, Prodr. xvi, 153.—Gray in Proc. Am. Acad. vii, 401.—Vasey, Cat. Forest Trees, 28.—Hall in Coulter's Bot. Gazette, ii, 91.—Watson, Bot. California, ii, 81.

? *M. Xalapensis*, Hooker & Arnott, Bot. Beechey, 160.

Cape Poulweather, Oregon, south near the coast to the bay of Monterey, California.

A small evergreen tree, rarely exceeding 9 meters in height, with a trunk 0.30 to 0.45 meter in diameter, or toward its northern limits reduced to a low shrub; sandy beaches and gravelly hillsides.

Wood heavy, very hard, strong, brittle, very close-grained, compact; medullary rays numerous, thin, conspicuous; color, light rose, the sap-wood lighter; specific gravity, 0.6703; ash, 0.33.

## C U P U L I F E R Æ .

251.—*Quercus alba*, Linnaeus,

Spec. 1 ed. 936.—Du Roi, Harbk. ii, 270, t. 5, f. 5.—Lamarek, Diet. i, 720.—Marshall, Arbustum, 119.—Wangenheim, Amer. 12, t. 3, f. 6.—Walter, Fl. Caroliniana, 235.—Aiton, Hort. Kew. iii, 358; 2 ed. v, 293.—Abbot, Insects Georgia, ii, t. 80, 87.—Michaux, Fl. Bor.-Am. ii, 195.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 395.—Willdenow, Spec. iv, 448; Enum. 977; Berl. Baumz. 346.—Persoon, Syn. ii, 570.—Desfontaines, Hist. Arb. ii, 508.—Michaux f. Hist. Arb. Am. ii, 13, t. 1; N. American Sylva, 3 ed. i, 22, t. 1.—Pursh, Fl. Am. Sept. ii, 633.—Barton, Prodr. Pl. Philadelph. 91; Compend. Pl. Philadelph. ii, 17.—Eaton, Manual, 108; 6 ed. 293.—Nuttall, Genera, ii, 215; Sylva, i, 14; 2 ed. i, 24.—Nouveau Duhamel, vii, 175.—Hayne, Dend. Fl. 158.—Elliott, Sk. ii, 607.—Sprungel, Syst. iii, 864.—Torrey, Compend. Fl. N. States, 359; Fl. N. York, ii, 192.—Audubon, Birds, t. 107, 147.—Beck, Bot. 330.—London, Arboretum, iii, 1864, f. 1723-1726 & t.—Hooker, Fl. Bor.-Am. ii, 158.—Eaton & Wright, Bot. 385.—Bigelow, Fl. Boston, 3 ed. 375.—Spach, Hist. Veg. xi, 155.—Emerson, Trees Massachusetts, 127, t. 1; 2 ed. i, 145 & t.—Griffith, Med. Bot. 585.—Penn. Cycl. xix, 216.—Richardson, Arctic Exped. 437.—Durlington, Fl. Cedrica, 3 ed. 206.—Darby, Bot. S. States, 511.—Cooper in Smithsonian Rep. 1858, 255.—Brendel in Trans. Illinois Ag. Soc. iii, 613, t. 1.—Chapman, Fl. S. States, 423.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 31.—Lasgoreux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 645; Bot. & Fl. 306.—Pursh, Resources S. Forests, 257.—A. De Candolle, Prodr. xvi, 22.—Orsted in Suorskitt. Aftryk. af Nat. For. Vidon-Meddelt. Nos. 1-6, 1866, 66.—Lichmann, Chânes Am. Trop. t. xxxiii, 29, 30, 58, 59.—Gray, Manual N. States, 6 ed. 450; Hall's Pl. Texas, 21.—Kuch, Dendrologie, ii, 50.—Young, Bot. Texas, 505.—Vasey, Cat. Forest Trees, 25.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Sears in Bull. Essex Inst. xiii, 179.—Britton in Bull. Torrey Bot. Club, viii, 120.—Bell in Geological Rep. Canada, 1870-'80, 52.—Ridgway in Proc. U. S. Nat. Mus. 78.

? *Q. sinuata*, Walter, Fl. Caroliniana, 235.

*Q. alba*, var. *pinnatifida*, Michaux, Hist. Chânes Am. No. 4, t. 5, f. 1; Fl. Bor.-Am. ii, 195.—Loudon, Arboretum, iii, 1864.

*Q. alba*, var. *repanda*, Michaux, Hist. Chânes Am. No. 4, t. 5, f. 2.—Pursh, Fl. Am. Sept. ii, 633.—Hayne, Dend. Fl. 159.—London, Arboretum, iii, 1864.

*Q. alba*, var. *pinnatifido-sinuata*, Hayne, Dend. Fl. 158.

*Q. alba*, var. *sinuata*, Hayne, Dend. Fl. 159.

*Q. alba*, var. *microcarpa*, A. De Candolle, Prodr. xvi, 22.

## WHITE OAK.

Northern Maine, valley of the Saint Lawrence river, Ontario, lower peninsula of Michigan to southeastern Minnesota, south to the Saint John's river and Tampa bay, Florida, west to the valley of Nodaway river, Missouri, western Arkansas, and the valley of the Brazos river, Texas.

A large tree of the first economic value, 24 to 45 meters in height, with a trunk 1.20 to 2.40 meters in diameter; all soils; very common and reaching its greatest development along the western slopes of the Alleghany mountains and in the valley of the Ohio river and its tributaries, here often forming more than half the forest growth.

Wood strong, very heavy, hard, tough, close-grained, liable to check unless carefully seasoned, durable in contact with the soil; layers of annual growth strongly marked by several rows of large open ducts; medullary rays broad, prominent; color, brown, the sap-wood lighter brown; specific gravity, 0.7470; ash, 0.41; largely used in ship-building, construction of all sorts, cooperage, in the manufacture of carriages, agricultural implements, and baskets, and for railway ties, fencing, interior finish, cabinet-making, fuel, etc.

A decoction of the astringent inner bark is employed medicinally in cases of hemorrhage, dysentery, etc. (*U. S. Dispensatory*, 14 ed. 755.—*Nat. Dispensatory*, 2 ed. 1196).

252.—*Quercus lobata*, Née,

Ann. Cienc. Nat. iii, 278.—Smith in Rees' Cycl. xxx, No. 77.—Persoon, Syn. ii, 571.—Nouveau Duhamel, vii, 180.—Poirot, Suppl. ii, 224.—Bentham, Pl. Hartweg. 337.—Liebmann in Dansk. Vidensk. Selsk. Forhandl. 1854, 14; Chênes Am. Trop. 23, t. 42, f. 1-3.—Torrey, Bot. Mex. Boundary Survey, 205; Bot. Wilkes Exped. 461, t. 15.—A. De Candolle, Prodr. xvi<sup>2</sup>, 24.—Koch, Dendrologie, ii<sup>2</sup>, 53.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 388; Wheeler's Rep. vi, 374; Bot. California, ii, 95.

*Q. Hindsii*, Bentham, Bot. Sulphur, 55.—Endlicher, Genera, Suppl. iv. 24.—Walpers, Ann. i, 635.—Torrey in Pacific R. R. Rep. iv, 138; v, 365.—Newberry in Pacific R. R. Rep. vi, 29, 89, t. 1, f. 7.—Cooper in Smithsonian Rep. 1858, 261.—Bolander in Proc. California Acad. iii, 230.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. 1866, Nos. 1-6, 66.—Liebmann, Chênes Am. Trop. t. 42, f. 4.—R. Brown Campst. Horæ Sylvanæ, 52, f. 1-3.

*Q. longiglandata*, Torrey in Fremont's Geographical Mem. California, 15, 17.

*Q. Ransomi*, Kellogg in Proc. California Acad. i, 25.

## WHITE OAK. WEEPING OAK.

California, west of the Sierra Nevadas from the valley of the upper Sacramento river south through the foothills and interior valleys to the San Bernardino mountains.

The largest of the Pacific oaks, often 30 meters in height, with a trunk 0.90 to 2.40 meters in diameter; very common through the central part of the state.

Wood moderately hard, fine-grained, compact; layers of annual growth marked by few large open ducts and containing few smaller ducts arranged in lines parallel to the broad, conspicuous medullary rays; color, light brown, the sap-wood lighter; specific gravity, 0.7409; ash, 0.30; of little economic value, and only used for fuel.

253.—*Quercus Garryana*, Douglas;

Hooker, Fl. Bor.-Am. ii, 159.—Hooker & Arnott, Bot. Beechey, 391.—Nuttall, Sylva, i, 1, t. 1; 2 ed. i, 14, t. 1.—Torrey in Pacific R. R. Rep. iv, 133; Bot. Wilkes Exped. 462.—Newberry in Pacific R. R. Rep. vi, 89.—Cooper in Smithsonian Rep. 1858, 260; Pacific R. R. Rep. xii<sup>2</sup>, 28, 68; Am. Nat. iii, 407.—Lyll in Jour. Linnaean Soc. vii, 131, 144.—A. De Candolle, Prodr. xvi<sup>2</sup>, 24.—Bolander in Proc. California Acad. iii, 229.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. 1866, Nos. 1-6, 66.—Rothrock in Smithsonian Rep. 1858, 435.—Liebmann, Chênes Am. Trop. t. 40, f. 3.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 389; Bot. California, ii, 95.—Macoun in Geological Rep. Canada, 1875-'76, 210.—G. M. Dawson in Canadian Nat. new ser. ix, 330.

*Q. Newi*, Liebmann in Dansk. Vidensk. Selsk. Forhandl. 1854, 173; Chênes Am. Trop. 23, t. xli, f. 1, 2.

*Q. Douglasii*, var. ?*Newi*, A. De Candolle, Prodr. xvi<sup>2</sup>, 24.

*Q. Ørstediana*, R. Brown Campst. in Ann. & Mag. Nat. Hist. April, 1871, 2.

*Q. Jacobi*, R. Brown Campst. in Ann. & Mag. Nat. Hist. April, 1871, 7.

## WHITE OAK.

Vancouver's island, shores of Puget sound, south through western Washington territory, Oregon, and California to San Francisco bay; in Washington territory and Oregon extending to the eastern slopes of the Cascade mountains.

A tree 21 to 30 meters in height, with a trunk 0.60 to 0.90 meter in diameter, or at high elevations reduced to a low shrub; dry, gravelly soil; common.

Wood strong, hard, that of the young trees tough, close-grained, compact; layers of annual growth marked by one to three rows of open ducts; medullary rays, varying greatly in width, often conspicuous; color, light brown or yellow, the sap-wood lighter, often nearly white; specific gravity, 0.7453; ash, 0.39; somewhat used for carriage and cooperage stock, in cabinet-making, ship-building, and very largely for fuel; the best substitute for eastern white oak produced in the Pacific forests.

254.—*Quercus obtusiloba*, Michaux,

Hist. Chênes Am. No. 1, t. 1; Fl. Bor.-Am. ii, 194.—Smith in Rees' Cycl. xxx, No. 78.—Michaux f. Hist. Arb. Am. ii, 36, t. 4; N. American Sylva, 3 ed. i, 36, t. 5.—Pursh, Fl. Am. Sept. ii, 632.—Nuttall, Genera, ii, 215.—Barton, Compend. Fl. Philadelph. ii, 171.—Elliott, Sk. ii, 606.—Torrey, Compend. Fl. N. States, 359; Fl. N. York, ii, 190.—Beck, Bot. 329.—Eaton, Manual, 6 ed. 293.—Loudon, Arboretum, iii, 1870, f. 1732 & t.—Hooker, Fl. Bor.-Am. ii, 158.—Eaton & Wright, Bot. 384.—Scheele in Rømer, Texas, 446.—Darlington, Fl. Cestrica, 3 ed. 265.—Darby, Bot. S. States, 511.—Cooper in Smithsonian Rep. 1858, 255.—Brendel in Trans. Illinois Ag. Soc. iii, 615, t. 11.—Chapman, Fl. S. States, 423.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 32.—Lesqueroux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 645; Bot. & Fl. 306.—Engelmann in Trans. Am. Phil. Soc. new ser. xii, 209.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. 1866, Nos. 1-6, 66.—Liebmann, Chênes Am. Trop. t. H, t. 33, f. 60.—Gray, Manual N. States, 5 ed. 451; Hall's, Pl. Texas, 21.—Young, Bot. Texas, 505.

- Q. alba minor*, Marshall, Arbustum, 120.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 395.
- Q. stellata*, Wangenheim, Amer. 78, t. 6, f. 15.—Abbot, Insects Georgia, ii, t. 77.—Willdenow, Spec. iv, 452; Enum, 977; Berl. Baumz. 349.—Persoon, Syn. ii, 570.—Aiton, Hort. Kew. 2 ed. v, 294.—Nouveau Duhamel, vii, 180.—Hayne, Dend. Fl. 161.—Nuttall, Sylva, i, 13; 2 ed. i, 23.—Spach, Hist. Veg. xi, 156.—Emerson, Trees Massachusetts, 133, t. 3; 2 ed. i, 151 & t.—A. De Candolle, Prodr. xvi<sup>2</sup>, 22.—Koch, Dendrologie, iii, 52.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 389.—Ridgway in Proc. U. S. Nat. Mus. 1882, 84.—Watson in Proc. Am. Acad. xviii, 156.
- ? *Q. villosa*, Walter, Fl. Caroliniana, 235.
- Q. lobulata*, Abbot, Insects Georgia, i, 47.
- ? *Q. Drummondii*, Liebmann in Dansk. Vidensk. Selsk. Forhandl. 1854, 170.—A. De Candolle, Prodr. xvi<sup>2</sup>, 24.
- Q. obtusiloba*, var. *parvifolia*, Chapman, Fl. S. States, 423.
- Q. stellata*, var. *Floridana*, A. De Candolle, Prodr. xvi<sup>2</sup>, 22.

## POST OAK. IRON OAK.

Martha's Vineyard, Massachusetts, south to northern Florida, west through southern Ontario and Michigan to eastern Nebraska, Kansas, the Indian territory, and extending to the one hundredth meridian in central Texas.

A tree rarely exceeding 24 meters in height, with a trunk 0.90 to 1.50 meter in diameter, or on the Florida coast reduced to a low shrub (var. *parvifolia*, etc.); dry, gravelly uplands, clay barrens, or in the southwest on Cretaceous formations; the most common and widely-distributed oak of the Gulf states west of the Mississippi river, forming the principal growth of the Texas "cross-timbers."

Wood heavy, hard, close-grained, compact, checking badly in drying, very durable in contact with the soil; layers of annual growth marked by one to three rows of not large open ducts; medullary rays numerous, conspicuous; color, dark or light brown, the sap-wood lighter; specific gravity, 0.8367; ash, 0.79; largely used, especially in the southwest, for fencing, railway ties, and fuel, and somewhat for carriage stock, cooperage, construction, etc.

255.—*Quercus undulata*, var. *Gambelii*, Engelmann,

Wheeler's Rep. vi, 249.

- Q. Gambelii*, Nuttall in Jour. Philadelphia Acad. new ser. i, 179.—Torrey in Sitgreaves' Rep. 172, t. 18; Bot. Mex. Boundary Survey, 205.—Cooper in Smithsonian Rep. 1858, 260.—Liebmann, Chênes Am. Trop. 22, t. 40, f. 1.—Hemsley, Bot. Am.-Cent. iii, 171.
- Q. alba*, var. ? *Gunnisonii*, Torrey in Pacific R. R. Rep. ii, 130.—Watson in King's Rep. v, 321.—Porter in Hayden's Rep. 1871, 493.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 127.—Macoun in Geological Rep. Canada, 1875-'76, 209.
- Q. Douglasii*, var. *Gambelii*, A. De Candolle, Prodr. xvi<sup>2</sup>, 23.
- Q. stellata*, var. *Utahensis*, A. De Candolle, Prodr. xvi<sup>2</sup>, 22.
- ? *Q. Emoryi*, Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 127 [not Torrey].

## SCRUB OAK.

Near the mouth of the Pecos river (*Havard*), through the mountains of western Texas, and New Mexico to the Santa Catalina (*Lemmon, Pringle*) and San Francisco mountains, Arizona, eastern slopes of the Rocky mountains of Colorado north to the valley of the Platte river, and through the Wahsatch mountains of Utah.

A small tree, rarely 15 meters in height, with a trunk sometimes 0.60 meter in diameter, or often a low shrub spreading from underground shoots and forming dense thickets, reaching its greatest development on the high mountains of southern New Mexico and Arizona; the large specimens generally hollow and defective.

Wood heavy, hard, strong, that of young trees quite tough, close-grained, checking badly in drying; layers of annual growth marked by few not large open ducts; medullary rays numerous, conspicuous; color, rich dark brown, the sap-wood lighter; specific gravity, 0.8407; ash, 0.99; largely used for fuel, and in Utah the bark in tanning.

256.—*Quercus macrocarpa*, Michaux,

Hist. Chênes Am. No. 2, t. 2, 3; Fl. Bor.-Am. ii, 194.—Willdenow, Spec. iv, 453; Enum. 977; Berl. Baumz. 350.—Smith in Rees' Cycl. xxx, No. 80.—Persoon, Syn. ii, 570.—Poirét, Suppl. ii, 224.—Michaux f. Hist. Arb. Am. ii, 34, t. 3; N. American Sylva, 3 ed. i, 35, t. 4.—Pursh, Fl. Am. Sept. ii, 632.—Nuttall, Genera, ii, 215.—Nouveau Duhamel, vii, 182.—Hayne, Dend. Fl. 161.—Sprengel, Syst. iii, 863.—Torrey, Compend. Fl. N. States, 359; Nicollet's Rep. 160; Fl. N. York, ii, 191, t. 108.—Beck, Bot. 330.—Eaton, Manual, 6 ed. 293.—London, Arboretum, iii, 1869, f. 1731 & t.—Eaton & Wright, Bot. 385.—Spach, Hist. Veg. xi, 159.—Emerson, Trees Massachusetts, 132, t. 2; 2 ed. i, 149 & t.—Scheele in Rœmer, Texas, 446.—Richardson, Arctic Exped. 437.—Cooper in Smithsonian Rep. 1858, 255.—Brendel in Trans. Illinois Ag. Soc. 131, t. 5, f. 21.—Chapman, Fl. S. States, 423.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 645; Bot. & Fl. 306.—Engelmann in Trans. Am. Phil. Soc. new ser. xii, 209; Trans. St. Louis Acad. iii, 389.—A. De Candolle, Prodr. xvi<sup>2</sup>, 20.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 67.—Liebmann, Chênes Am. Trop. t. G, t. 33, f. 27, 28.—Gray, Manual N. States, 5 ed. 451.—Koch, Dendrologie, ii<sup>2</sup>, 51.—Young, Bot. Texas, 506.—Winchell in Ludlow's Rep. Black Hills, 68.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 121.—Vasey, Cat. Forest Trees, 24.—Broadhead in Coulter's Bot. Gazette, iii, 60.—J. F. James in Jour. Cincinnati Soc. Nat. Hist. iv, 1 & t.—Ridgway in Proc. U. S. Nat. Mus. 1882, 81.—Bell in Geological Rep. Canada, 1879-'80, 49c.—Watson in Proc. Am. Acad. xviii, 156.

*Q. olivæformis*, Michaux f. Hist. Arb. Am. ii, 32, t. 2; N. American Sylva, 3 ed. i, 33, t. 3.—Smith in Rees' Cycl. xxx, No. 91.—Pursh, Fl. Am. Sept. ii, 632.—Nuttall, Genera, ii, 215; Sylva, i, 14; 2 ed. i, 24.—Nouveau Duhamel, vii, 181.—Sprengel, Syst. iii, 864.—Torrey, Compend. Fl. N. States, 359.—Fl. N. York, ii, 191.—Beck, Bot. 330.—Eaton, Manual, 6 ed. 293.—London, Arboretum, iii, 1869, f. 1730.—Eaton & Wright, Bot. 385.—Spach, Hist. Veg. xi, 159.—Gray, Manual N. States, 1 ed. 414.—A. De Candolle, Prodr. xvi<sup>2</sup>, 20.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 67.—Engelmann in Trans. St. Louis Acad. iii, 391.

*Q. obtusiloba*, var. *depressa*, Nuttall, Genera, ii, 215.

*Q. macrocarpa*, var. *olivæformis*, Gray, Manual N. States, 2 ed. 404; 5 ed. 451.

*Q. macrocarpa*, var. *abbreviata*, A. De Candolle, Prodr. xvi<sup>2</sup>, 20.

*Q. macrocarpa*, var. *minor*, A. De Candolle, Prodr. xvi<sup>2</sup>, 20.

*Q. stellata*, var. *depressa*, A. De Candolle, Prodr. xvi<sup>2</sup>, 23.

## BURR OAK. MOSSY-CUP OAK. OVER-CUP OAK.

Nova Scotia, New Brunswick, northern shores of lake Huron to lake Winnipeg, south to the valley of the Penobscot river, Maine (*C. D. Hamlin*), and along the shores of lake Champlain and the valley of the Ware river, Massachusetts, to Lancaster county, Pennsylvania, west to the eastern foot-hills of the Rocky mountains of Montana, central Nebraska and Kansas, southwest to the Indian territory and the valley of the Nueces river, Texas.

A large tree of the first economic value, 24 to 30 or, exceptionally, 50 meters in height, with a trunk 1.20 to 2.10 meters in diameter; rich bottoms and prairies; in the prairie region the principal growth of the "oak openings", and extending farther west and northwest than any oak of the Atlantic forests.

Wood heavy, strong, hard, tough, close-grained, compact, more durable in contact with the soil than that of other American oaks; layers of annual growth marked by one to three rows of small open ducts; medullary rays often broad and conspicuous; color, dark or rich light brown, the sap-wood much lighter; specific gravity, 0.7453; ash, 0.71; generally confounded with the less valuable white oak (*Q. alba*), and employed for the same purposes.

257.—*Quercus lyrata*, Walter,

Fl. Caroliniana, 235.—Abbot, Insects Georgia, ii, f. 83.—Michaux, Hist. Chênes Am. No. 3, t. 4; Fl. Bor.-Am. ii, 195.—Willdenow, Spec. iv, 453.—Smith in Rees' Cycl. xxx, No. 79.—Persoon, Syn. ii, 570.—Poirét, Suppl. ii, 224.—Michaux f. Hist. Arb. Am. ii, 42, t. 5; N. American Sylva, 3 ed. i, 39, t. 6.—Aiton, Hort. Kew. 2 ed. v, 295.—Pursh, Fl. Am. Sept. ii, 632.—Nouveau Duhamel, vii, 181.—Nuttall, Genera, ii, 215.—Elliott, Sk. ii, 607.—Sprengel, Syst. xi, 156.—Eaton, Manual, 6 ed. 295.—London, Arboretum, iii, 1871, f. 1733, 1734.—Eaton & Wright, Bot. 386.—Spach, Hist. Veg. xi, 156.—Darby, Bot. S. States, 511.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 423.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 33.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Bot. & Fl. 306.—A. De Candolle, Prodr. xvi<sup>2</sup>, 19.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 66.—Koch, Dendrologie, ii<sup>2</sup>, 53.—Gray, Hall's Pl. Texas, 21.—Young, Bot. Texas, 506.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 389.—Ridgway in Proc. U. S. Nat. Mus. 1882, 80.

## OVER-CUP OAK. SWAMP POST OAK. WATER WHITE OAK.

North Carolina, south near the coast to the Chattahoochee region of northern Florida, west through Alabama, Mississippi, and Louisiana to the valley of the Trinity river, Texas, and through Arkansas and southeastern Missouri (Allenton, *Letterman*) to middle Tennessee, southern Indiana and Illinois.

A tree 24 to 30 meters in height, with a trunk 0.60 to 0.90 meter in diameter; deep, often submerged, river swamps; rare in the Atlantic states; more common and reaching its greatest development in the valley of the Red river and the adjacent portions of Arkansas and Texas.

Wood heavy, hard, strong, tough, very durable in contact with the ground, close-grained, inclined to check in drying; layers of annual growth marked by one to three rows of large open ducts; medullary rays broad, numerous, conspicuous; color, rich dark brown, the sap-wood much lighter; specific gravity, 0.8313; ash, 0.65; used for the same purposes as that of the white oak (*Q. alba*).

258.—*Quercus bicolor*, Willdenow,

Neue Schriften Gesell. Nat. Fr. Berlin, iii, 396; Spec. iv, 440.—Smith in Rees' Cycl. xxx, No. 50.—Persoon, Syn. ii, 569.—Poiret, Suppl. ii, 219.—Pursh, Fl. Am. Sept. ii, 633.—Eaton, Manual, 107; 6 ed. 294.—Barton, Compend. Fl. Philadelph. ii, 172.—Nuttall, Genera, ii, 215; Sylva, i, 13; 2 ed. i, 23.—Nouveau Duhamel, vii, 165.—Sprengel, Syst. iii, 860.—Torrey, Compend. Fl. N. States, 359; Fl. N. York, ii, 192.—Beck, Bot. 331.—Bigelow, Fl. Boston. 3 ed. 375.—Eaton & Wright, Bot. 385.—Emerson, Trees Massachusetts, 135, t. 4; 2 ed. i, 153 & t.—Buckley in Am. Jour. Sci. 2 ser. xiii, 397.—Darlington, Fl. Cestrica, 3 ed. 206.—Lesquereux in Owen's 2d Rep. Arkansas, 357.—Wood, Cl. Book, 646; Bot. & Fl. 306.—A. De Candolle, Prodr. xvi<sup>2</sup>, 20.—Ørsted in Saerskitt. Aftryk. af. Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 67.—Gray, Manual N. States, 5 ed. 451.—Koch, Dendrologie, ii<sup>2</sup>, 47.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 389.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Sears in Bull. Essex Inst. xiii, 179.—Bell in Geological Rep. Canada, 1879-80, 55c.—Ridgway in Proc. U. S. Nat. Mus. 1882, 79.

? *Q. Prinus platanoides*, Lamarek, Dict. i, 21.

*Q. alba palustris*, Marshall, Arbustum, 120.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 395.

*Q. Prinus tomentosa*, Michaux, Hist. Chênes Am. No. 5, t. 9, f. 2; Fl. Bor.-Am. ii, 196.—Loudon, Arboretum, iii, 1876, f. 1730.

*Q. Prinus*, var. *discolor*, Michaux f. Hist. Arb. Am. ii, 46, t. 6; N. American Sylva, 3 ed. i, 41, t. 7.—Cooper in Smithsonian Rep. 1858, 255.—Brendel in Trans. Illinois Ag. Soc. iii, 617, t. 3.—Chapman, Fl. S. States, 424.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 34.

*Q. bicolor*, var. *mollis*, Nuttall, Genera, ii, 215.—Torrey, Compend. Fl. N. States, 359.

*Q. Prinus*, var. *bicolor*, Spach, Hist. Veg. xi, 158.

? *Q. bicolor*, var. *platanoides*, A. De Candolle, Prodr. xvi<sup>2</sup>, 21.

## SWAMP WHITE OAK.

Southern Maine, valley of the upper Saint Lawrence river, Ontario, southern peninsula of Michigan to southeastern Iowa and western Missouri, south to Delaware, and along the Alleghany mountains to northern Georgia, northern Kentucky, and northern Arkansas.

A large tree, 24 to 36 meters in height, with a trunk 1.20 to 2.40 or, exceptionally, over 3 meters ("Wadsworth Oak", Geneseo, New York) in diameter; borders of streams and swamps, in deep alluvial soil; common and reaching its greatest development in the region south of the great lakes.

Wood heavy, hard, strong, tough, close-grained, inclined to check in seasoning; layers of annual growth marked by one to three rows of large open ducts; medullary rays broad and conspicuous; color, light brown, the sap-wood hardly distinguishable; specific gravity, 0.7662; ash, 0.58; used for the same purposes as that of the white oak (*Q. alba*).

259.—*Quercus Michauxii*, Nuttall,

Genera, ii, 215 (excl. syn.).—Elliott, Sk. ii, 609.—Sprengel, Syst. iii, 860.—Eaton, Manual, 6 ed. 295.—Eaton & Wright, Bot. 386.—Darby, Bot. S. States, 511.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 382.—Ward in Bull. U. S. Nat. Mus. No. 22, 113.—Ridgway in Proc. U. S. Nat. Mus. 1882, 81.

*Q. Prinus palustris*, Michaux, Hist. Chênes Am. No. 5, t. 6; Fl. Bor.-Am. ii, 196.—Michaux f. Hist. Arb. Am. ii, 51, t. 7; N. American Sylva, 3 ed. i, 44, t. 8.—Barton, Prodr. Fl. Philadelph. 91.—Loudon, Arboretum, iii, 1872, f. 1735 & t.

*Q. Prinus*, var. *Michauxii*, Chapman, Fl. S. States, 424.

*Q. Prinus*, Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 33, in part.

*Q. bicolor*, var. *Michauxii*, Engelmann in Trans. St. Louis Acad. iii, 390.

## BASKET OAK. COW OAK.

New Castle county, Delaware, south through the lower and middle districts to northern Florida, through the Gulf states to the valley of the Trinity river, Texas, and through Arkansas and southwestern Missouri to central Tennessee and Kentucky, and the valley of the lower Wabash river.

A tree 24 to 36 meters in height, with a trunk 1.20 to 2.10 meters in diameter; borders of streams and deep, often submerged, swamps; the common and most valuable white oak of the Gulf states, reaching its greatest development in the rich bottom lands of southeastern Arkansas and Louisiana.

Wood heavy, hard, very strong, tough, close-grained, compact, very durable in contact with the soil, easily split; layers of annual growth marked by few rather large open ducts; medullary rays broad, conspicuous; color, light brown, the sap-wood darker; specific gravity, 0.8039; ash, 0.45; largely used in the manufacture of agricultural implements, wheel stocks, baskets, for which it is unsurpassed, for cooperage, fencing, construction, and fuel.

The large, sweet, edible acorns eagerly devoured by cattle and other animals.

260.—*Quercus Prinus*, Linnæus,

Spec. 1 ed. 995.—Du Roi, Harbk. ii, 276, t. 6, f. 3.—Lamarck, Dict. i, 720.—Marshall, Arbustum, 125.—Wangenheim, Amer. I5, t. 4, f. 8.—Aiton, Hort. Kew. iii, 356; 2 ed. v, 290.—Moench, Meth. 348.—Albot, Insects Georgia, ii, t. 82.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 397.—Michaux, Fl. Bor.-Am. ii, 195.—Willdenow, Spec. iv, 439; Enum. 975; Berl. Baumz. 339.—Smith in Rees' Cycl. xxx, No. 47.—Persoon, Syn. ii, 568.—Desfontaines, Hist. Arb. ii, 509.—Pursh, Fl. Am. Sept. ii, 633.—Barton, Compend. Fl. Philadelph. ii, 171.—Nuttall, Genera, ii, 215.—Nouveau Duhamel, vii, 164.—Hayne, Dend. Fl. 155.—Elliott, Sk. ii, 608.—Sprengel, Syst. iii, 859.—Torrey, Compend. Fl. N. States, 359.—Audubon, Birds, t. 50, 131.—Beck, Bot. 331.—Eaton, Manual, 6 ed. 294.—Loudon, Arboretum, iii, 1872.—Eaton & Wright, Bot. 385.—Spach, Hist. Veg. xi, 157.—Penn. Cycl. xix, 216.—Darlington, Fl. Cestrica, 3 ed. 267.—Darby, Bot. S. States, 511.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 424.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 645; Bot. & Fl. 306.—Porcher, Resources S. Forests, 264.—A. De Candolle, Prodr. xvi<sup>3</sup>, 21.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 67.—Gray, Manual N. States, 5 ed. 451.—Young, Bot. Texas, 506.—Koch, Dendrologie, ii<sup>3</sup>, 48.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 390.

*Q. Prinus*, var. *monticola*, Michaux, Hist. Chênes Am. No. 5, t. 7; Fl. Bor.-Am. ii, 196.—Michaux f. Hist. Arb. Am. ii, 55, t. 8; N. American Sylva, 3 ed. i, 46, t. 9.—Barton, Prodr. Fl. Philadelph. 91.—Loudon, Arboretum, iii, 1873, f. 1736.—Spach, Hist. Veg. xi, 158.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 424.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 34.—Wood, Cl. Book, 646.—A. De Candolle, Prodr. xvi<sup>3</sup>, 21.—Gray, Manual N. States, 5 ed. 451.—Vasey, Cat. Forest Trees, 25.—Bailey in Am. Nat. xiv, 892, f. 1-4.

*Q. montana*, Willdenow, Spec. iv, 440; Enum. 975; Berl. Baumz. 340.—Persoon, Syn. ii, 569.—Smith in Rees' Cycl. xxx, No. 49.—Pursh, Fl. Am. Sept. ii, 634.—Eaton, Manual, 107, 6 ed. 294.—Barton, Compend. Fl. Philadelph. ii, 172.—Nuttall, Genera, ii, 216.—Nouveau Duhamel, vii, 165, t. 47, f. 2.—Hayne, Dend. Fl. 156.—Elliott, Sk. ii, 609.—Sprengel, Syst. iii, 860.—Torrey, Compend. Fl. N. States, 354; Fl. N. York, ii, 192.—Beck, Bot. 331.—Bigelow, Fl. Boston. 3 ed. 377.—Eaton & Wright, Bot. 385.—Emerson, Trees Massachusetts, 138, t. 6; 2 ed. i, 156 & t.—Gray, Manual N. States, 1 ed. 414.—Darlington, Fl. Cestrica, 3 ed. 266.—Darby, Bot. S. States, 511.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Porcher, Resources S. Forests, 263.—Burgess in Coulter's Bot. Gazette, vii, 95.

*Q. Prinus*, var. *lata*, Aiton, Hort. Kew. 2 ed. v, 290.

*Q. Castanea*, Emerson, Trees Massachusetts, 137, t. 5; 2 ed. i, 155 & t. [not Muhlenberg & Willdenow].

## CHESTNUT OAK. ROCK CHESTNUT OAK.

Blue hills, eastern Massachusetts, west to the shores of lake Champlain, shores of Quinté bay, Ontario (*Macoun*), and the valley of the Genesee river, New York, south to Delaware, and through the Alleghany Mountain region to northern Alabama, extending west to central Kentucky and Tennessee.

A tree 24 to 30 meters in height, with a trunk 0.90 to 1.20 meter in diameter; rocky banks and hillsides; very common and reaching its greatest development in the southern Alleghany region, here often forming a large portion of the forest growth.

Wood heavy, hard, strong, rather tough, close-grained, inclined to check in drying, durable in contact with the soil, containing few open ducts; medullary rays very broad, conspicuous; color, dark brown, the sap-wood lighter; specific gravity, 0.7499; ash, 0.77; largely used in fencing, for railway ties, etc.

The bark, rich in tannin, is largely used in preference to that of other North American white oaks in tanning leather.

261.—*Quercus prinoides*, Willdenow,

Neue Schriften Gesell. Nat. Fr. Berlin, iii, 397; Spec. iv, 440.—Persoon, Syn. ii, 569.—Poiret, Suppl. ii, 219.—Nouveau Duhamel, vii, 166.—Torrey, Fl. N. York, ii, 193, t. 109.—Gray, Manual N. States, 1 ed. 415.—Darlington, Fl. Cestrica, 3 ed. 267.—Chapman, Fl. S. States, 424.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 35.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 646.—Koch, Dendrologie, ii<sup>3</sup>, 49.—Young, Bot. Texas, 506.—Engelmann in Trans. St. Louis Acad. iii, 391.

*Q. Prinus humilis*, Marshall, Arbustum, 125.—Gray, Manual N. States, 5 ed. 452.

*Q. Castanea*, Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 396 [not Née].—Willdenow, Spec. iv, 441; Enum. 976; Berl. Baumz. 341.—Persoon, Syn. ii, 569.—Pursh, Fl. Am. Sept. ii, 634.—Smith in Rees' Cycl. xxx, No. 51.—Poiret, Suppl. ii, 219.—Eaton, Manual, 107; 6 ed. 294.—Barton, Compend. Fl. Philadelph. ii, 172.—Nuttall, Genera, ii, 216.—Hayne, Dend. Fl. 156.—Elliott, Sk. ii, 610.—Sprengel, Syst. iii, 860.—Torrey, Compend. Fl. N. States, 354; Fl. N. York, ii, 193.—Beck, Bot. 331.—Eaton & Wright, Bot. 385.—Gray, Manual N. States, 1 ed. 415.—Darlington, Fl. Cestrica, 3 ed. 267.—Darby, Bot. S. States, 511.—Brendel in Trans. Illinois Ag. Soc. iii, 619, t. 4.—Chapman, Fl. S. States, 424.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 34.—Lesquereux in Owen's 2d Rep. Arkansas, 387.—Wood, Cl. Book, 646.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 68.—Liebmann, Chênes Am. Trop. t. H, K. & 33, f. 31, 32.—Young, Bot. Texas, 506.

*Q. Prinus*, var. *acuminata*, Michaux, Hist. Chênes Am. No. 5, t. 8; Fl. Bor.-Am. ii, 196.—Michaux f. Hist. Arb. Am. ii, 61, t. 9; N. American Sylva, 3 ed. i, 49, t. 10.—Nouveau Duhamel, vii, 167.—Loudon, Arboretum, iii, 1875, f. 1637.—Cooper in Smithsonian Rep. 1858, 255.—Wood, Bot. & Fl. 306.—Gray, Manual N. States, 5 ed. 451.—Vasey, Cat. Forest Trees, 25.

*Q. Prinus pumila*, Michaux, Hist. Chênes Am. No. 5, t. 9, f. 1; Fl. Bor.-Am. ii, 196.—Loudon, Arboretum, iii, 1875, f. 1738.

- Q. Prinus Chinquapin*, Michaux f. Hist. Arb. Am. ii, 65, t. 10; N. American Sylva, 3 ed. i, 50, t. 11.—A. De Candolle, Prodr. xvi<sup>2</sup>, 21.
- Q. Chinquapin*, Pursh, Fl. Am. Sept. ii, 634.—Smith in Rees' Cycl. xxx, No. 48.—Nuttall, Genera, ii, 216.—Elliott, Sk. ii, 611.—Torrey, Compend. Fl. N. States, 354.—Beck, Bot. 331.—Eaton, Manual, 6 ed. 294.—Darlington, Fl. Cestrica, 2 ed. 536.—Eaton & Wright, Bot. 385.—Bigelow, Fl. Boston. 3 ed. 377.—Emerson, Trees Massachusetts, 140; 2 ed. i, 156 & t.—Darby, Bot. S. States, 511.
- Q. Prinus*, var. *oblongata*, Aiton, Hort. Kew. v, 290.
- Q. Prinus*, var. *prinoïdes*, Wood, Bot. & Fl. 306.
- Q. Muhlenbergii*, Engelmann in Trans. St. Louis Acad. iii, 591.—G. D. Butler in Coulter's Bot. Gazette, iii, 77.—Ridgway in Proc. U. S. Nat. Mus. 1882, 82.

## YELLOW OAK. CHESTNUT OAK. CHINQUAPIN OAK.

Eastern Massachusetts, shores of lake Champlain, west along the northern shores of lakes Ontario and Erie, through southern Michigan to eastern Nebraska, eastern Kansas, and the Indian territory; south to Delaware and through the Alleghany region to northern Alabama and Mississippi, southwest to the Guadalupe mountains, western Texas (*Havard*).

A tree 24 to 30 or, exceptionally, 39 meters (*Ridgway*) in height, with a trunk 0.60 to 0.90 meter in diameter (*Q. Muhlenbergii*), or often, especially toward the eastern and western limits of its range, reduced to a low, slender shrub (*Q. prinoïdes*); dry hillsides and low, rich bottoms; rare, except as a shrub, east of the Alleghany mountains; very common in the Mississippi River basin, and reaching its greatest development in southern Arkansas.

Wood heavy, hard, very strong, close-grained, checking badly in drying, very durable in contact with the soil; layers of annual growth marked by rows of small open ducts; medullary rays broad, conspicuous; color, dark brown, the sap-wood much lighter; specific gravity, 0.8605; ash, 1.14; used for cooperage, wheel stock, fencing, railway ties, etc.

The small acorns sweet and edible.

NOTE.—Differences in the size and habit of individuals of this species, thus enlarged, seem to be dependent upon soil and climate, numerous intermediate forms connecting the extremes of eastern Massachusetts and the Mississippi valley.

262.—*Quercus Douglasii*, Hooker & Arnott,

Bot. Beechey, 391.—Hooker, Icon. iv, t. 382, 383.—Bentham, Pl. Hartweg. 337; Bot. Sulphur, 55.—Nuttall, Sylva, i, 10, t. 4; 2 ed. i, 20, t. 4.—Torrey in Pacific R. R. Rep. v, 365; Bot. Wilkes Exped. 462.—Cooper in Smithsonian Rep. 1858, 260.—A. De Candolle, Prodr. xvi<sup>2</sup>, 23.—Bolander in Proc. California Acad. iii, 230.—Orsted in Saerskitt. Aftryk. af. Nat. For. Viden. Meddelt. Nos. 1-6, 66.—Liebmann, Chênes Am. Trop. t. 41, f. 3, 4.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 392; Bot. California, ii, 95.—Hall in Coulter's Bot. Gazette, ii, 91.

*Q. oblongifolia*, var. *brevilobata*, Torrey in Bot. Wilkes Exped. 460.

## MOUNTAIN WHITE OAK. BLUE OAK.

California, from about latitude 39°, south along the western foot-hills of the Sierra Nevadas below 4,000 feet elevation, and through the Coast ranges to the San Gabriel mountains.

A tree 18 to 24 meters in height, with a trunk 0.60 to 1.20 meter in diameter; common on the low foot-hills of the sierras.

Wood very hard, heavy, strong, brittle, inclined to check in drying; layers of annual growth marked by several rows of small open ducts and containing many scattered groups of smaller ducts; medullary rays numerous, varying greatly in width; color, dark brown, becoming nearly black with exposure, the thick sap-wood light brown; specific gravity, 0.8928; ash, 0.84.

263.—*Quercus oblongifolia*, Torrey,

Sitgreaves' Rep. 173; Bot. Mex. Boundary Survey, 206; Ives' Rep. 28.—Cooper in Smithsonian Rep. 1858, 261.—A. De Candolle, Prodr. xvi<sup>2</sup>, 36.—Watson, Pl. Wheeler, 17.—Vasey, Cat. Forest Trees, 26.—Engelmann in Trans. St. Louis Acad. iii, 393; Bot. California, ii, 96.

*Q. undulata*, var. *oblongata*, Engelmann in Wheeler's Rep. vi, 250.

## WHITE OAK.

California, foot-hills of the San Gabriel mountains, and in San Diego county (here occupying a narrow belt, 30 miles in width some 30 miles from the coast, *Parish Brothers*); foot-hills of the mountain ranges of southern Arizona and New Mexico; southward into Mexico.

A small evergreen tree, 12 to 15 meters in height, with a trunk 0.45 to 0.60 meter in diameter; the large specimens generally hollow and defective.

Wood very heavy, hard, strong, brittle, very close-grained, checking badly in drying; layers of annual growth hardly distinguishable, containing few small open ducts arranged in many groups parallel to the broad and very conspicuous medullary rays; color, very dark brown or almost black, the thick sap-wood brown; specific gravity, 0.9441; ash, 2.61; of little economic value except as fuel.

264.—*Quercus grisea*, Liebmann,

Dansk. Vidensk. Selsk. Forhandl. 1854, 13; Chênes Am. Trop. t. 46, f. 1, 2.—A. De Candolle, Prodr. xvi<sup>2</sup>, 35.—Ørsted in Saerskitt. Aftryk. af. Nat. For. Viden. Meddeit. Nos. 1-6, 1866, 69.—Rusby in Bull. Torrey Bot. Club, ix, 78.—Watson in Proc. Am. Acad. xviii, 156.

*Q. pungens*, Liebmann in Dansk. Vidensk. Selsk. Forhandl. 1854, 13; Chênes Am. Trop. 22, t. 45, f. 1-3.—A. De Candolle, Prodr. xvi<sup>2</sup>, 36.—Ørsted in Saerskitt. Aftryk. af. Nat. For. Viden. Meddeit. Nos. 1-6, 69.—Rusby in Bull. Torrey Bot. Club ix, 78.

*Q. undulata*, var. *grisea*, Engelmann in Trans. St. Louis Acad. iii, 382; Wheeler's Rep. vi, 250.

*Q. undulata*, var. *pungens*, Engelmann in Trans. St. Louis Acad. iii, 392; Wheeler's Rep. vi, 250; Bot. California, ii, 96.—Palmer in Am. Nat. xii, 596.

*Q. undulata*, var. *Wrightii*, Engelmann in Trans. St. Louis Acad. iii, 382, 392.

## WHITE OAK.

Mountains of southern Colorado and western Texas (*Havard*), southern New Mexico and Arizona from 5,000 to 10,000 feet elevation, west to the Colorado desert of California; southward into northern Mexico.

A tree 15 to 24 meters in height, with a trunk rarely exceeding 0.60 meter in diameter, or reduced to a low, much-branched shrub; a polymorphous species, varying greatly in habit and in the shape and texture of the leaves, but apparently well characterized by its connate cotyledons; the large specimens generally hollow and defective.

Wood very heavy, strong, hard, close-grained, checking badly in drying; layers of annual growth marked by one or two rows of small open ducts, these connected by rows of similar ducts parallel to the numerous conspicuous medullary rays; color, very dark brown, the thick sap-wood much lighter; specific gravity, 1.0092; ash, 1.82.

265.—*Quercus reticulata*, Humboldt & Bonpland,

Pl. Æquin. ii, 40, t. 86.—Poiret, Suppl. v, 609.—Sprengel, Syst. iii, 860.—Loudon, Arboretum, iii, 1944, f. 1865.—Michaux f. N. American Sylva, 3 ed. i, 90.—A. De Candolle, Prodr. xvi<sup>2</sup>, 33.—Ørsted in Saerskitt. Aftryk. af. Nat. For. Viden. Meddeit. Nos. 1-6, 67.—Liebmann, Chênes Am. Trop. t. H, t. 34, f. 10-16, t. 35, f. 15-22.—Vasey, Cat. Forest Trees, 26.—Engelmann in Trans. St. Louis Acad. iii, 383; Wheeler's Rep. vi, 250.—Hemsley, Bot. Am.-Cent. iii, 176.—Watson in Proc. Am. Acad. xviii, 156. ?

*Q. spicata*, Humboldt & Bonpland, Pl. Æquin. ii, 46, t. 89.—Bentham, Pl. Hartweg. No. 429.

*Q. decipiens*, Martens & Galeotti in Bull. Brux. v, 10.

? *Q. reticulata*, var. *Greggii*, A. De Candolle, Prodr. xvi<sup>2</sup>, 34.—Hemsley, Bot. Am.-Cent. iii, 176.

Southeastern Arizona, San Francisco and Santa Rita mountains from 7,000 to 10,000 feet elevation; southward into northern Mexico.

A small tree, 9 to 12 meters in height, with a trunk 0.30 to 0.45 meter in diameter; dry, gravelly slopes.

Wood very heavy, hard, close-grained, checking badly in drying, containing many small, scattered, open ducts; medullary rays numerous, very broad; color, dark brown, the sap-wood lighter; specific gravity, 0.9479; ash, 0.52.

266.—*Quercus Durandii*, Buckley,

Proc. Philadelphia Acad. 1860, 445; 1881, 121.—Gray, Hall's Pl. Texas, 21.—Young, Bot. Texas, 507.—Vasey, Cat. Forest Trees, 26.—Watson in Proc. Am. Acad. xviii, 156.

*Q. obtusifolia*, var. ? *breviloba*, Torrey, Bot. Mex. Boundary Survey, 206.

*Q. annulata*, Buckley in Proc. Philadelphia Acad. 1860, 445.

*Q. San-Sabeana*, Buckley in Young, Bot. Texas, 507.

*Q. undulata*, Engelmann in Trans. St. Louis Acad. iii, 392, in part [not Torrey].

Alabama, Wilcox county (*Buckley*), valley of the Little Cahaba river, Bibb county (*Mohr*); Shreveport, Louisiana?, (*Buckley*); Texas, Dallas (*Reverchon*), valley of the Colorado river (*Buckley, Mohr, Sargent*), west and south.

A tree 21 to 24 meters in height, with a trunk 0.60 to 1.20 meter in diameter; rich bottom lands or dry *mesas* and limestone hills, then reduced to a low shrub, forming dense, impenetrable thickets of great extent (*Q. San-Sabeana*); rare and local in Alabama; the common and most valuable white oak of western Texas.

Wood very heavy and hard, strong, brittle, close-grained, inclined to check in drying; layers of annual growth marked by few large open ducts; medullary rays numerous, conspicuous; color, brown, the sap-wood lighter; specific gravity, 0.9507; ash, 1.78; used for the same purposes as that of the white oak (*Q. alba*).

267.—*Quercus virens*, Aiton,

Hort. Kew. iii, 356; 2 ed. v, 287.—Bartram, Travels, 2 ed. 82.—Michaux, Hist. Chênes Am. No. 6, t. 10, 11; Fl. Bor.-Am. ii, 196.—Willdenow, Spec. iv, 425; Enum. 974.—Robin, Voyages, iii, 264.—Smith in Rees' Cycl. xxx, No. 5.—Persoon, Syn. ii, 567.—Desfontaines, Hist. Arb. ii, 507.—Poiret, Suppl. ii, 213.—Michaux f. Hist. Arb. Am. ii, 67, t. 11; N. American Sylva, 3 ed. i, 52, t. 12.—Pursh, Fl. Am. Sept. ii, 626.—Nuttall, Genera, ii, 214; Sylva, i, 16; 2 ed. i, 28.—Nouveau Duhamel, vii, 151.—Elliott, Sk. ii, 595.—Sprengel, Syst. iii, 858.—Cobbett, Woodlands, 446.—Eaton, Manual. 6 ed. 294.—Loudon, Arboretum, iii, 1918, f. 1802, 1803 & t.—Eaton & Wright, Bot. 385.—Spach, Hist. Veg. xi, 177.—Engelmann & Gray in Jour. Boston Soc. Nat. Hist. v, 234.—Scheele in Rœmer, Texas, 446; Appx. 147.—Penn. Cycl. xix, 216.—Darby, Bot. S. States, 510.—Torrey, Bot. Mex. Boundary Survey, 206.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 421.—Curtis in Rep. Geological Surv. N. Carolina, 35.—Wood, Cl. Book, 643; Bot. & Fl. 305.—Porcher, Resources S. Forests, 263.—A. De Candolle, Prodr. xvi<sup>2</sup>, 37.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 69.—Gray, Manual N. States, 5 ed. 452; Hall's Pl. Texas, 21.—Liebmann, Chênes Am. Trop. t. 33, f. 50-57.—Young, Bot. Texas, 503.—Vasey, Cat. Forest Trees, 26.—Engelmann in Trans. St. Louis Acad. iii, 383; iv, 191.—Hemsley, Bot. Am.-Cent. iii, 178.—Watson in Proc. Am. Acad. xviii, 155.

*Q. Virginiana*, Miller, Dict. 7 ed. No. 17.—Koch, Dendrologie, ii<sup>2</sup>, 57.

*Q. Phellos*, var. *sempervirens*, Marshall, Arbustum, 124.

*Q. sempervirens*, Walter, Fl. Caroliniana, 234.

*Q. oleoides*, Chamisso & Schlechtendal in Linnæa, v, 79.—Martens & Galeotti in Bull. Brux. x, No. 3.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 69.

*Q. retusa*, Liebmann in Dansk. Vidensk. Selsk. Forhandl. 1854, 187.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 69.

## LIVE OAK.

Mob Jack bay, Virginia, south along the coast to bay Biscayne and cape Romano, Florida, along the Gulf coast to Mexico, extending through western Texas to the valley of the Red river, the Apache and Gaudalupe mountains and the mountains of northern Mexico south of the Rio Grande at 6,000 to 8,000 feet elevation (*Havard*); in Costa Rica (*Q. retusa*).

An evergreen tree of great economic value, 15 to 18 meters in height, with a trunk 1.50 to 2.10 meters in diameter, or in the interior of Texas much smaller, often shrubby; on the coast, rich hummocks and ridges, a few feet above water-level; common and reaching its greatest development in the south Atlantic states.

Wood very heavy, hard, strong, tough, very close-grained, compact, difficult to work, susceptible of a beautiful polish; layers of annual growth obscure, often hardly distinguishable, containing many small open ducts arranged in short broken rows parallel to the broad, conspicuous medullary rays; color, light brown or yellow, the sap-wood nearly white; specific gravity, 0.9501; ash, 1.14; formerly very largely and now occasionally used in ship-building.

268.—*Quercus chrysolepis*, Liebmann,

Dansk. Vidensk. Selsk. Forhandl. 1854, 173; Chênes Am. Trop. 23, t. 47.—Torrey, Bot. Mex. Boundary Survey, 206; Bot. Wilkes Exped. 458.—Cooper in Smithsonian Rep. 1858, 260.—Kellogg in Proc. California Acad. ii, 45.—A. De Candolle, Prodr. xvi<sup>2</sup>, 37.—Bolander in Proc. California Acad. iii, 231.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 69.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 383, 393; Wheeler's Rep. vi, 374; Bot. California, ii, 97.—Watson in Proc. Am. Acad. xi, 119.—Palmer in Am. Nat. xii, 596.

*Q. fulvescens*, Kellogg in Proc. California Acad. i, 67, 71.—Newberry in Pacific R. R. Rep. vi, 27, 89.

*Q. crassipocula*, Torrey in Pacific R. R. Rep. iv, 137; v, 365, t. 9.

? *Q. oblongifolia*, R. Brown Campst. in Ann. & Mag. Nat. Hist. April, 1871, 4 [not Torrey].

## LIVE OAK. MAUL OAK. VALPARAISO OAK.

Cow Creek valley, Oregon, south through the California Coast ranges and along the western slopes of the Sierra Nevada and San Bernardino mountains between 3,000 and 8,000 feet elevation, and south into Lower California; southeastern Arizona, San Francisco (*Greene*) and Santa Catalina mountains (*Pringle*).

An evergreen tree of great economic value, 18 to 27 meters in height, with a trunk sometimes 1.50 meter in diameter, or at high elevations reduced to a low, narrow-leaved shrub (var. *vaccinifolia*, *Engelmann in Trans. St. Louis Acad.* iii, 393; *Bot. California*, ii, 97.—*Q. vaccinifolia*, *Kellogg in Trans. California Acad.* ii, 96).

Wood heavy, very strong and hard, tough, close-grained, compact, difficult to work, containing many rather small open ducts arranged in wide bands parallel to the broad, conspicuous medullary rays; color, light brown, the sap-wood darker; specific gravity, 0.8493; ash, 0.60; somewhat used in the manufacture of agricultural implements, wagons, etc.; the most valuable oak of the Pacific forests.

269.—*Quercus Emoryi*, Torrey,

Emory's Rep. 151, t. 9; Bot. Mex. Boundary Survey, 206; Pacific R. R. Rep. iv, 138; Ives' Rep. 28.—Watson in Pl. Wheeler, 17.—Vasey, Cat. Forest Trees, 26.—Engelmann in Trans. St. Louis Acad. iii, 382, 387, 394; Wheeler's Rep. vi, 250.—Palmer in Am. Nat. xii, 596.—Hemsley, Bot. Am.-Cent. iii, 170.

*Q. hastata*, Liebmann in Dansk. Vidensk. Selsk. Forhandl. 1854, 13; Chênes Am. Trop. 22.—A. De Candolle, Prodr. xvi<sup>2</sup>, 36.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 69.

## BLACK OAK.

Bexar and Comal counties, Texas, through the mountain ranges of western Texas, of southern New Mexico, and of eastern and southern Arizona.

A tree 12 to 15 meters in height, with a trunk 0.30 to 0.90 meter in diameter, or toward its eastern limits in Texas reduced to a low shrub; common and reaching its greatest development in southwestern New Mexico and southern Arizona between 5,000 and 7,000 feet elevation near streams in open cañons; dry, gravelly soil, the large specimens hollow and defective.

Wood very heavy, not hard, strong, brittle, close-grained, compact; layers of annual growth marked by several rows of small open ducts, these connected by narrow groups of similar ducts parallel to the broad, conspicuous medullary rays; color, dark brown or almost black, the thick sap-wood bright brown tinged with red; specific gravity, 0.9263; ash, 2.36.

270.—*Quercus agrifolia*, Née,

Ann. Cienc. Nat. iii, 271.—Fischer, Misc. Hisp. i, 108.—Willdenow, Spec. iv, 431.—Persoon, Syn. ii, 568.—Smith in Rees' Cycl. xxx, No. 29.—Pursh, Fl. Am. Sept. ii, 627.—Nuttall, Genera, ii, 214; Sylva, i, 5, t. 2; 2 ed. i, 16, t. 2.—Nouveau Duhamel, vii, 156.—Sprengel, Syst. iii, 859.—Eaton, Manual, 6 ed. 292.—Loudon, Arboretum, iii, 1894.—Bentham, Pl. Hartweg. 337; Bot. Sulphur, 55.—Eaton & Wright, Bot. 384.—Hooker, Icon. iv, t. 377.—Hooker & Arnott, Bot. Beechey, 391.—Jour. Hort. Soc. London, vi, 157 & t.—Carrière in Fl. des Serres, vii, 137 & f.—Torrey in Sitgreaves' Rep. 173; Pacific R. R. Rep. iv, 138; v, 365; vii, 20; Bot. Mex. Boundary Survey, 206; Ives' Rep. 28; Bot. Wilkes Exped. 460.—Paxton's Brit. Flower Gard. ii, 44.—Newberry in Pacific R. R. Rep. vi, 32, f. 9.—Bolander in Proc. California Acad. iii, 229.—A. De Candolle, Prodr. xvi<sup>2</sup>, 37.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 69.—Liebmann, Chênes Am. Trop. t. 44.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 383; Wheeler's Rep. vi, 374; Bot. California, ii, 98.—Hemsley, Bot. Am.-Cent. iii, 167.

*Q. oxyadenia*, Torrey in Sitgreaves' Rep. 172, t. 17.—Cooper in Smithsonian Rep. 1858, 261.

*Q. acutigliandis*, Kellogg in Proc. California Acad. i, 25.

## ENCENO. COAST LIVE OAK.

California, Mendocino county, south through the Coast Range valleys to Lower California.

A large evergreen tree, 24 to 30 meters in height, with a trunk 1.20 to 2.10 meters in diameter, or, rarely, reduced to a low shrub (var. *frutescens*, Engelmann in *Bot. California*, ii, 98); rare at the north; common south of San Francisco bay, and the largest and most generally distributed oak in the extreme southwestern part of the state; dry slopes and ridges.

Wood heavy, hard, strong, brittle, close-grained, compact; layers of annual growth hardly distinguishable, containing many large open ducts arranged in several rows parallel to the broad, conspicuous medullary rays; color, light brown or red, the sap-wood darker brown; specific gravity, 0.8253; ash, 1.28; of little value except as fuel.

271.—*Quercus Wislizeni*, A. DeCandolle,

Prodr. xvi<sup>s</sup>, 67.—Ørsted in *Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 73.*—Vasey, *Cat. Forest Trees*, 27.—Engelmann in *Trans. St. Louis Acad.* iii, 385, 396; *Bot. California*, ii, 98.

*Q. Morehus*, Kellogg in *Proc. California Acad.* ii, 36.

## LIVE OAK.

California, mount Shasta region, south along the western slopes of the Sierra Nevadas to Tulare county, and in the Coast ranges south to the Santa Lucia mountains.

An evergreen tree, 15 to 18 meters in height, with a trunk 0.90 to 1.80 meter in diameter, or toward its northeastern limits reduced to a shrub 0.90 to 3 meters in height (var. *frutescens*, Engelmann in *Bot. California*, ii, 99); not common.

Wood heavy, very hard, strong, close-grained, compact, containing numerous large open ducts arranged in irregular bands parallel to the broad, conspicuous medullary rays; color, light brown tinged with red, the sap-wood lighter; specific gravity, 0.7855; ash, 1.02.

272.—*Quercus rubra*, Linnæus,

Spec. 1 ed. 996.—Du Roi, *Harbk.* ii, 265.—Lamarck, *Dict.* i, 720.—Walter, *Fl. Caroliniana*, 234.—Aiton, *Hort. Kew.* iii, 357; 2 ed. v, 292.—Möench, *Meth.* 348.—Abbot, *Insects Georgia*, ii, t. 103.—Michaux, *Hist. Chênes* No. 2, t. 35, 36; *Fl. Bor.-Am.* ii, 200.—Willdenow, *Spec.* iv, 445; *Enum.* 976; *Berl. Baumz.* 342.—Smith in *Rees' Cycl.* xxx, No. 60.—Persoon, *Syn.* ii, 569.—Desfontaines, *Hist. Arb.* ii, 511.—Michaux f. *Hist. Arb. Am.* ii, 126, t. 26; *N. American Sylva*, 3 ed. i, 84, t. 28.—Pursh, *Fl. Am. Sept.* ii, 630.—Eaton, *Manual*, 108; 6 ed. 293.—Nuttall, *Genera*, ii, 214.—Barton, *Compend. Fl. Philadelph.* ii, 169.—Nouveau Duhamel, vii, 170.—Hayne, *Dend. Fl.* 157.—Elliott, *Sk.* ii, 602.—Sprengel, *Syst.* iii, 863.—Torrey, *Compend. Fl. N. States*, 358; *Nicollet's Rep.* 160; *Fl. N. York*, 189, t. 106.—Book, *Bot.* 329.—London, *Arboretum*, iii, 1877, f. 1740-1744 & t.—Hooker, *Fl. Bor.-Am.* ii, 158.—Bigelow, *Fl. Boston.* 3 ed. 376.—Eaton & Wright, *Bot.* 384.—Spach, *Hist. Veg.* xi, 165.—Emerson, *Trees Massachusetts*, 48, t. 10; 2 ed. i, 163 & t.—Scheele in *Reamer, Texas*, 446.—Penn. *Cycl.* xix, 216.—Darlington, *Fl. Cestricea*, 3 ed. 269.—Darby, *Bot. S. States*, 510.—Cooper in *Smithsonian Rep.* 1858, 255.—Brendel in *Trans. Illinois Ag. Soc.* iii, 369, t. 9.—Chapman, *Fl. S. States*, 422.—Curtis in *Rep. Geological Surv. N. Carolina*, 1860, iii, 41.—Lesquereux in *Owen's 2d Rep. Arkansas*, 388.—Wood, *Cl. Book*, 644; *Bot. & Fl.* 306.—Porcher, *Resources S. Forests*, 262.—Engelmann in *Trans. Am. Phil. Soc. new ser.* v, 209; *Trans. St. Louis Acad.* iii, 394.—A. De Candolle, *Prodr.* xvi<sup>s</sup>, 60.—Ørsted in *Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 72.*—Gray, *Manual N. States*, 5 ed. 454; *Hall's Pl. Texas*, 21.—Liebmann, *Chênes Am. Trop.* t. A, B.—Koch, *Dendrologie*, ii<sup>s</sup>, 70.—Young, *Bot. Texas*, 504.—Hayden in *Warren's Rep. Nebraska & Dakota*, 2 ed. 121.—Vasey, *Cat. Forest Trees*, 26.—Macoun in *Geological Rep. Canada*, 1875-'76, 209.—Sears in *Bull. Essex Inst.* xiii, 179.—Ridgway in *Proc. U. S. Nat. Mus.* 1882, 83.—Bell in *Geological Rep. Canada*, 1879-'80, 51<sup>c</sup>.

*Q. rubra maxima*, Marshall, *Arbustum*, 122.—Muhlenberg & Willdenow in *Neue Schriften Gesell. Nat. Fr. Berlin*, iii, 395.

*Q. rubra*, var. *latifolia*, Lamarck, *Dict.* i, 720.—Aiton, *Hort. Kew.* 2 ed. v, 292.—London, *Arboretum*, iii, 1877.

*Q. rubra*, var. *montana*, Aiton, *Hort. Kew.* 2 ed. v, 292.—London, *Arboretum*, iii, 1877.

*Q. ambigua*, Michaux f. *Hist. Arb. Am.* ii, 120, t. 24; *N. American Sylva*, 3 ed. i, 81, t. 26 [not HBK.].—Pursh, *Fl. Am. Sept.* ii, 630.—Nuttall, *Genera*, ii, 214.—Eaton, *Manual*, 6 ed. 293.—London, *Arboretum*, iii, 1881, f. 1749 & t.—Eaton & Wright, *Bot.* 384.

*Q. coccinea*, var. *rubra*, Spach, *Hist. Veg.* xi, 165.

*Q. coccinea*, var. *ambigua*, Gray, *Manual N. States*, 5 ed. 454.

*Q. rubra*, var. *runcinata*, A. De Candolle, *Prodr.* xvi<sup>s</sup>, 60.—Engelmann in *Trans. St. Louis Acad.* iii, 542.

## RED OAK. BLACK OAK.

Nova Scotia, southern New Brunswick to eastern Minnesota, western Iowa, eastern Kansas, and the Indian territory, south to northern Florida, southern Alabama and Mississippi, and the valley of the San Antonio river, Texas.

A large tree, 24 to 30 or, exceptionally, 45 meters (*Ridgway*) in height, with a trunk 1.20 to 2.10 meters in diameter; very common, especially at the north, in all soils and extending farther north than any Atlantic oak.

Wood heavy, hard, strong, coarse-grained, inclined to check in drying; layers of annual growth marked by several rows of very large open ducts; medullary rays few, conspicuous; color, light brown or red, the sap-wood somewhat darker; specific gravity, 0.6540; ash, 0.26; now largely used for clapboards, cooperage, and somewhat for interior finish, in the manufacture of chairs, etc.

Var. *Texana*, Buckley,

Proc. Philadelphia Acad. 1881, 123.—Engelmann in Coulter's Bot. Gazette, vii, 14.

*Q. palustris*, Torrey & Gray in Pacific R. R. Rep. ii, 175 [not Du Roi].

*Q. coccinea*, var. *microcarpa*, Torrey, Bot. Mex. Boundary Survey, 206.

*Q. Texana*, Buckley in Proc. Philadelphia Acad. 1860, 445.—Young, Bot. Texas, 507.

## RED OAK.

Western Texas, valley of the Colorado river with the species and replacing it south and west, extending to the valley of the Nueces river and the Limpia mountains (*Haward*).

A tree 21 to 24 meters in height, with a trunk rarely exceeding 0.60 meter in diameter.

Wood heavier, harder, much closer-grained than the species, not checking in drying; layers of annual growth marked with fewer and smaller open ducts; specific gravity, 0.9080; ash, 0.85.

273.—*Quercus coccinea*, Wangenheim,

Amer. 44, t. 4. f. 9.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 398.—Michaux, Hist. Chênes Am. No. 18, t. 31, 32; Fl. Bor.-Am. ii, 199.—Willdenow, Spec. iv, 445; Enum. 976; Berl. Baumz. 343.—Smith in Rees' Cycl. xxx, 61.—Persoon, Syn. ii, 569.—Desfontaines, Hist. Arb. ii, 511.—Poiret, Suppl. ii, 221.—Michaux f. Hist. Arb. Am. ii, 116, t. 23; N. American Sylva, 3 ed. i, 79, t. 25.—Aiton, Hort. Kew. 2 ed. v, 292.—Pursh, Fl. Am. Sept. ii, 630.—Eaton, Manual, 108; 6 ed. 292.—Nuttall, Genera, ii, 214.—Barton, Compend. Fl. Philadelph. ii, 169.—Nouveau Duhamel, vii, 171.—Hayne, Dend. Fl. 157.—Elliott, Sk. ii, 602.—Sprengel, Syst. iii, 863.—Torrey, Compend. Fl. N. States, 358; Fl. N. York, ii, 189.—Beck, Bot. 329.—Loudon, Arboretum, iii, 1879, f. 1746-1748 & t.—Eaton & Wright, Bot. 384.—Bigelow, Fl. Boston. 3 ed. 376.—Spach, Hist. Veg. xi, 165.—Emerson, Trees Massachusetts, 144, t. 9; 2 ed. i, 163 & t.—Scheele in Rœmer, Texas, 446.—Penn. Cycl. xix, 216.—Darlington, Fl. Cestrica, 3 ed. 268.—Darby, Bot. S. States, 510.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 422.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 40.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 645; Bot. & Fl. 306.—A. De Candolle, Prodr. xvi<sup>2</sup>, 61.—Orsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 72.—Gray, Manual N. States, 5 ed. 453.—Liebmann, Chênes Am. Trop. t. B.—Koeh, Dendrologie, ii<sup>2</sup>, 69.—Young, Bot. Texas, 504.—Vasey, Cat. Forest Trees, 26.—Engelmann in Trans. St. Louis Acad. iii, 385, 394.—Ridgway in Proc. U. S. Nat. Mus. 1882, 80.—Watson in Proc. Am. Acad. xviii, 156.

*Q. rubra*,  $\beta$ . Linnæus, Spec. 1 ed. 996.—Aiton, Hort. Kew. iii, 357.

## SCARLET OAK.

Southern Maine to northern New York, Ontario, northern Michigan and Minnesota, eastern Iowa and northeastern Missouri, south to Delaware and southern Tennessee, and through the Alleghany region to northern Florida.

A tree 24 to 30 or, exceptionally, 54 meters (*Ridgway*) in height, with a trunk rarely exceeding 0.60 to 1.20 meter in diameter; at the east in dry, sandy soil or, less commonly, in rich, deep soil; in the northwestern prairie region with *Q. macrocarpa* forming the oak-opening growth; not common and reaching its greatest development in the basin of the lower Ohio river.

Wood heavy, hard, strong, coarse-grained; layers of annual growth strongly marked by several rows of large open ducts; medullary rays thin, conspicuous; color, light brown or red, the sap-wood rather darker; specific gravity, 0.7405; ash, 0.19; if used at all, confounded with that of *Q. rubra*.

274.—*Quercus tinctoria*, Bartram,

Travels, 2 ed. 37.—Abbot, Insects Georgia, ii, t. 56.—Michaux, Hist. Chênes Am. No. 13, t. 24, 25; Fl. Bor.-Am. ii, 198.—Willdenow, Spec. iv, 444; Enum. 976; Berl. Baumz. 344.—Desfontaines, Hist. Arb. ii, 509.—Poiret, Suppl. ii, 221.—Michaux f. Hist. Arb. Am. ii, 110, t. 22; N. American Sylva, 3 ed. i, 76, t. 24.—Aiton, Hort. Kew. 2 ed. v, 291.—Pursh, Fl. Am. Sept. ii, 629.—Smith in Rees' Cycl. xxx, No. 58.—Barton, Prodr. Fl. Philadelph. 91; Compend. Fl. Philadelph. ii, 168.—Eaton, Manual, 108; 6 ed. 292.—Nuttall, Genera, ii, 214; Sylva, i, 21; 2 ed. i, 32.—Nouveau Duhamel, vii, 169.—Hayne, Dend. Fl. 156.—Elliott, Sk. ii, 601.—Sprengel, Syst. iii, 862.—Torrey, Compend. Fl. N. States, 357; Fl. N. York, ii, 188.—Audubon, Birds, t. 32.—Beck, Bot. 323.—Loudon, Arboretum, iii, 1884, f. 1753, 1754.—Hooker, Fl. Bor.-Am. ii, 158.—Bigelow, Fl. Boston. 3 ed. 376.—Eaton & Wright, Bot. 384.—Spach, Hist. Veg. xi, 164.—Emerson, Trees Massachusetts, 141, t. 7; 2 ed. i, 160 & t.—Griffith, Med. Bot. 586.—Gray, Manual N. States, 1 ed. 416.—Darlington, Fl. Cestrica, 3 ed. 268.—Darby, Bot. S. States, 510.—Cooper in Smithsonian Rep. 1858, 255.—Brendel in Trans. Illinois Ag. Soc. iii, 627, t. 8.—Chapman, Fl. S. States, 422.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 39.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 645.—Engelmann in Proc. Am. Phil. Soc. new ser. xii, 209; Trans. St. Louis Acad. iii, 395.—Porcher, Resources S. Forests, 238.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 45, 72, f. 18.—Liebmann, Chênes Am. Trop. 9, f. 6.—Young, Bot. Texas, 504.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 121.—Guibourt, Hist. Drogues, 7 ed. ii, 288.—Vasey, Cat. Forest Trees, 27.—Bentley & Trimen, Med. Fl. iv, 251, t. 251.—Ridgway in Proc. U. S. Nat. Mus. 1882, 84.

? *Q. velutina*, Lamarek, Dict. i, 172.—Koch, Dendrologie, ii<sup>2</sup>, 68.

*Q. nigra*, Marshall, Arbustum, 120 [not Linnæus].—Wangenheim, Amer. 79, t. 6, f. 16.

*Q. rubra*, Wangenheim, Amer. 14, t. 3, f. 7 [not Linnæus].—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 399.

*Q. discolor*, Aiton, Hort. Kew. iii, 358.—Abbot, Insects Georgia, ii, 111.—Willdenow, Spec. iv, 444; Berl. Baumz. 345.—Poiret, Suppl. ii, 221.—Smith in Rees' Cycl. xxx, No. 59.—Nuttall, Genera, ii, 214.—Elliott, Sk. ii, 601.—Sprengel, Syst. iii, 863.—Beck, Bot. 329.—Eaton, Manual, 6 ed. 292.—Eaton & Wright, Bot. 384.

*Q. tinctoria*, var. *angulosa*, Michaux, Fl. Bor.-Am. ii, 198.—Loudon, Arboretum, iii, 1858.

*Q. tinctoria*, var. *sinuosa*, Michaux, Fl. Bor.-Am. ii, 198.—Loudon, Arboretum, iii, 1885, f. 1755-1757.—Liebmann, Chênes Am. Trop. t. C.

? *Q. shumardii*, Buckley in Proc. Philadelphia Acad. 1860, 445.

*Q. coccinea*, var. *tinctoria*, Gray, Manual N. States, 5 ed. 454.—Wood, Cl. Book, 306.—A. De Candolle, Prodr. xvi<sup>2</sup>, 61.

## BLACK OAK. YELLOW-BARK OAK. QUERCITRON OAK. YELLOW OAK.

Southern Maine to northern Vermont, Ontario, southern Minnesota, eastern Nebraska, eastern Kansas, and the Indian territory, south to the Chattahoochee region of western Florida, southern Alabama and Mississippi, and eastern Texas.

A large tree, 24 to 36 or, exceptionally, 48 meters (*Ridgway*) in height, with a trunk 0.90 to 1.80 meter in diameter; generally on dry or gravelly uplands; very common.

Wood heavy, hard, strong, not tough, coarse-grained, liable to check in drying; layers of annual growth marked by several rows of very large open ducts; color, bright brown tinged with red, the sap-wood much lighter; specific gravity, 0.7045; ash, 0.28; somewhat used for cooperage, construction, etc.

The bark largely used in tanning; the intensely bitter inner bark yields a valuable yellow dye, and is occasionally used medicinally in the form of decoctions, etc., in the treatment of hemorrhage (*U. S. Dispensatory*, 14 ed. 756.—*Nat. Dispensatory*, 2 ed. 1196).

275.—*Quercus Kelloggii*, Newberry,

Pacific R. R. Rep. vi, 89, 286, f. 6.—Torrey, Bot. Wilkes Exped. 463.—R. Brown Campst. Horæ Sylvaniae, 58, f. 4-6.—Engelmann in Bot. California, ii, 99.

*Q. rubra*, Bentham, Pl. Hartweg. 337 [not Linnæus].

*Q. tinctoria*, var. *Californica*, Torrey in Pacific R. R. Rep. iv, 138; Bot. Mex. Boundary Survey, 205; Ives' Rep. 28.

*Q. Californica*, Cooper in Smithsonian Rep. 1858, 261.

*Q. Sonomensis*, Bentham in De Candolle Prodr. xvi<sup>2</sup>, 62.—Bolander in Proc. California Acad. iii, 230.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 72.—Vasey, Cat. Forest Trees, 27.—Engelmann in Wheeler's Rep. vi, 374.—Palmer in Am. Nat. xii, 596.

## BLACK OAK.

Valley of the Mackenzie river, Oregon, south through the Coast ranges and along the western slopes of the Sierra Nevada and San Bernardino mountains to the southern borders of California.

A large tree, 18 to 24 meters in height, with a trunk 0.90 to 1.20 meter in diameter, or at high elevations reduced to a shrub; the most common and important oak of the valleys of southwestern Oregon and the California Sierras.

Wood heavy, hard, strong, very brittle, close-grained, compact; layers of annual growth marked by several rows of large open ducts; medullary rays few, broad, conspicuous; color, light red, the thin sap-wood lighter; specific gravity, 0.6435; ash, 0.26; of little value, except as fuel; the bark somewhat used in tanning.

276.—*Quercus nigra*, Linnæus,

Spec. 1 ed. 995.—Lamarck, Dict. i, 721.—Wangenheim, Amer. 77, t. 5, f. 13.—Walter, Fl. Caroliniana, 234.—Aiton, Hort. Kew. iii, 357; 2 ed. v, 291.—Abbot, Insects Georgia, i, 50; ii, 58.—Michaux, Hist. Chênes Am. No. 17, t. 22, 23; Fl. Bor.-Am. ii, 198.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 399.—Willdenow, Spec. iv, 442.—Smith in Rees' Cycl. xxx, No. 53.—Persoon, Syn. ii, 569.—Desfontaines, Hist. Arb. ii, 509.—Pursh, Fl. Am. Sept. ii, 629.—Eaton, Manual, 108; 6 ed. 292.—Barton, Compend. Fl. Philadelph. ii, 168.—Nouveau Duhamel, vii, 168.—Elliott, Sk. ii, 600.—Sprengel, Syst. iii, 862.—Torrey, Compend. Fl. N. States, 357; Fl. N. York, ii, 188; Bot. Mex. Boundary Survey, 206.—Audubon, Birds, t. 116.—Beck, Bot. 328.—Loudon, Arboretum, iii, 1890, f. 1764, 1765.—Eaton & Wright, Bot. 384.—Spach, Hist. Veg. xi, 102.—Darlington, Fl. Cestrica, 3 ed. 267.—Darby, Bot. S. States, 510.—Cooper in Smithsonian Rep. 1858, 255.—Brendel in Trans. Illinois Ag. Soc. iii, 625, t. 7.—Chapman, Fl. S. States, 421.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 38.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 644; Bot. & Fl. 305.—A. De Candolle, Prodr. xvi<sup>2</sup>, 63.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 72.—Gray, Manual N. States, 5 ed. 453; Hall's Pl. Texas, 21.—Liebmann, Chênes Am. Trop. t. A.—Koch, Dendrologie, ii<sup>2</sup>, 61.—Young, Bot. Texas, 503.—Vasey, Cat. Forest Trees, 26.—Ridgway in Proc. Nat. Mus. 1882, 82.—Watson in Proc. Am. Acad. xviii, 156.

*Q. nigra*, var. *latifolia*, Lamarck, Dict. i, 721.

*Q. nigra integrifolia*, Marshall, Arbustum, 121.

? *Q. aquatica*, Walter, Fl. Caroliniana, 234.

*Q. Marylandica*, Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 399.

BLACK JACK. JACK OAK. \*

Long island, New York, west through northern Ohio and Indiana to about latitude 55° N. in Wisconsin, southern Minnesota, eastern Nebraska, Kansas, and the Indian territory to about 99° west longitude, south to Matanzas inlet and Tampa bay, Florida, and the valley of the Nueces river, Texas.

A small tree, sometimes 12 or even 18 meters in height, with a trunk rarely exceeding 0.60 meter in diameter, or more often much smaller; dry, barren uplands, or often on heavy clay soils; very common through the southern states, and reaching its greatest development in southwestern Arkansas, Indian territory, and eastern Texas, forming, with the post-oak (*Q. obtusiloba*), the growth of the Texas cross-timbers.

Wood heavy, hard, strong, checking badly in drying; layers of annual growth marked by several rows of large open ducts; medullary rays broad, conspicuous; color, rather dark rich brown, the sap-wood much lighter; specific gravity, 0.7324; ash, 1.16; of little value except as fuel.

277.—*Quercus falcata*, Michaux,

Hist. Chênes Am. No. 16, t. 28; Fl. Bor.-Am. ii, 199.—Persoon, Syn. ii, 569.—Poiret, Suppl. ii, 221.—Michaux f. Hist. Arb. Am. ii, 104, t. 21; N. American Sylva, 3 ed. i, 73, t. 23.—Pursh, Fl. Am. Sept. ii, 630.—Nuttall, Genera, ii, 214.—Barton, Compend. Fl. Philadelph. ii, 170.—Nouveau Duhamel, vii, 169.—Elliott, Sk. ii, 604.—Torrey, Compend. Fl. N. States, 358.—Beck, Bot. 329.—Eaton, Manual, 6 ed. 293.—Loudon, Arboretum, iii, 1882, f. 1750, 1751.—Lindley, Fl. Med. 292.—Eaton & Wright, Bot. 384.—Darlington, Fl. Cestrica, 3 ed. 269.—Darby, Bot. S. States, 510.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 422.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 39.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 644; Bot. & Fl. 306.—Porcher, Resources S. Forests, 256.—A. De Candolle, Prodr. xvi<sup>2</sup>, 59.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 72.—Gray, Manual N. States, 5 ed. 453; Hall's Pl. Texas, 21.—Liebmann, Chênes Am. Trop. t. A, t. 22, f. 3.—Young, Bot. Texas, 505.—Vasey, Cat. Forest Trees, 26.—Ridgway in Proc. U. S. Nat. Mus. 1882, 80.

*Q. rubra montana*, Marshall, Arbustum, 123.

*Q. nigra digitata*, Marshall, Arbustum, 121.

*Q. cuneata*, Wangenheim, Amer. 78, t. 5, f. 14.—Koch, Dendrologie, ii<sup>2</sup>, 64.

*Q. elongata*, Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 400.—Willdenow, Spec. iv, 444.—Smith in Rees' Cycl. xxx, 57.—Aiton, Hort. Kew. 2 ed. v, 291.

*Q. triloba*, Michaux, Hist. Chênes Am. No. 14, t. 26.—Willdenow, Spec. iv, 443; Berl. Baumz. 342.—Smith in Rees' Cycl. xxx, No. 54.—Persoon, Syn. ii, 569.—Poiret, Suppl. ii, 220.—Aiton, Hort. Kew. 2 ed. v, 291.—Pursh, Fl. Am. Sept. ii, 628.—Hayne, Deud. Fl. 156.—Sprengel, Syst. iii, 862.—Torrey, Compend. Fl. N. States, 357.—Beck, Bot. 328.—Eaton, Manual, 6 ed. 292.—Eaton & Wright, Bot. 384.—Wood, Cl. Book, 644; Bot. & Fl. 306.

- Q. falcata*, var. *triloba*, Nuttall, Genera, ii, 214.—Elliott, Sk. ii, 604.—Darby, Bot. S. States, 511.—A. De Candolle, Prodr. xvi<sup>2</sup>, 59.
- Q. falcata*, var. *pagodaefolia*, Elliott, Sk. ii, 605.—Darby, Bot. S. States, 511.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 39.
- Q. discolor*, var. *triloba*, Spach, Hist. Veg. xi, 163.
- Q. falcata*, var. *Ludoviciana*, A. De Candolle, Prodr. xvi<sup>2</sup>, 59.

## SPANISH OAK. RED OAK.

Long island, New York, south to Hernando county, Florida, through the Gulf states to the valley of the Brazos river, Texas, and through Arkansas and southeastern Missouri to central Tennessee and Kentucky, southern Illinois and Indiana.

A large tree, 24 to 30 meters in height, with a trunk 0.90 to 1.80 meter in diameter; dry, gravelly uplands and barrens; in the north Atlantic states only near the coast; rare; most common and reaching its greatest development in the south Atlantic and Gulf states, where, in the middle districts, it is the most common forest tree.

Wood heavy, very hard and strong, not durable, coarse-grained, checking badly in drying; layers of annual growth strongly marked by several rows of large open ducts; medullary rays few, conspicuous; color, light red, the sap-wood lighter; specific gravity, 0.6928; ash, 0.25; somewhat used for cooperage, construction, etc., and very largely for fuel.

The bark rich in tannin.

278.—*Quercus Catesbæi*, Michaux,

Hist. Chênes Am. No. 17, t. 29, 30; Fl. Bor.-Am. ii, 199.—Abbot, Insects Georgia, i, 27, t. 14.—Willdenow, Spec. iv, 446.—Smith in Rees Cycl. xxx, No. 62.—Persoon, Syn. 569.—Desfontaines, Hist. Arb. ii, 511.—Poiret, Suppl. ii, 221.—Michaux f. Hist. Arb. Am. ii, 101, t. 20; N. American Sylva, 3 ed. i, 71, t. 22.—Pursh, Fl. Am. Sept. ii, 630.—Nuttall, Genera, ii, 214.—Nouveau Duhamel, vii, 172.—Elliott, Sk. ii, 603.—Sprengel, Syst. iii, 866.—Torrey, Compend. Fl. N. States, 358.—Beck, Bot. 329.—Eaton, Manual, 6 ed. 293.—London, Arboretum, iii, 1889, f. 1762, 1763.—Eaton & Wright, Bot. 384.—Spach, Hist. Veg. xi, 162.—Darby, Bot. S. States, 510.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 422.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 41.—Wood, Cl. Book, 644; Bot. & Fl. 306.—A. De Candolle, Prodr. xvi<sup>2</sup>, 59.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 72.—Koch, Dendrologie, ii<sup>2</sup>, 67.—Young, Bot. Texas, 503.—Vasey, Cat. Forest Trees, 26.

? *Q. laevis*, Walter, Fl. Caroliniana, 234.

## TURKEY OAK. SCRUB OAK. FORKED-LEAF BLACK JACK. BLACK JACK.

North Carolina, south near the coast to cape Malabar and Pease creek, Florida, and along the coast of Alabama and Mississippi.

A small tree, 7 to 15 meters in height, with a trunk 0.45 to 0.60 meter in diameter; very common in the south Atlantic and east Gulf states upon barren sandy hills and ridges of the maritime pine belt; rare in Mississippi.

Wood heavy, hard, strong, close-grained, compact; layers of annual growth marked by several rows of large open ducts and containing many much smaller ducts arranged in short lines parallel to the broad, conspicuous medullary rays; color, light brown tinged with red, the sap-wood somewhat lighter; specific gravity, 0.7294; ash, 0.87; largely used for fuel.

279.—*Quercus palustris*, Du Roi,

Harbk. ii, 268, t. 5, f. 4.—Wangenheim, Amer. 76, t. 5, f. 10.—Michaux, Hist. Chênes Am. No. 19, t. 33, 34; Fl. Bor.-Am. ii, 200.—Willdenow, Spec. iv, 446; Enum. 976; Berl. Baumz. 343.—Persoon, Syn. ii, 569.—Desfontaines, Hist. Arb. ii, 511.—Poiret, Suppl. ii, 222.—Michaux f. Hist. Arb. Am. ii, 123, t. 25; N. American Sylva, i, 83, t. 27.—Aiton, Hort. Kew. 2 ed. v, 292.—Smith in Rees' Cycl. xxx, No. 6.—Pursh, Fl. Am. Sept. ii, 631.—Barton, Prodr. Fl. Philadelph. 91; Compend. Fl. Philadelph. ii, 170.—Eaton, Manual, 108; 6 ed. 293.—Nuttall, Genera, ii, 214.—Nouveau Duhamel, vii, 172.—Hayne, Dend. Fl. 158.—Sprengel, Syst. iii, 863.—Torrey, Compend. Fl. N. States, 358; Fl. N. York, ii, 190, t. 107.—Beck, Bot. 329.—London, Arboretum, iii, 1887, f. 1758-1761 & t.—Eaton & Wright, Bot. 384.—Spach, Hist. Veg. xi, 166.—Darlington, Fl. Cestrica, 3 ed. 269.—Cooper in Smithsonian Rep. 1858, 255.—Brendel in Trans. Illinois Ag. Soc. iii, 631.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 644; Bot. & Fl. 306.—A. De Candolle, Prodr. xvi<sup>2</sup>, 60.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 23, 72, f. 4.—Gray, Manual N. States, 5 ed. 454.—Liebmann, Chênes Am. Trop. t. A.—Koch, Dendrologie, ii<sup>2</sup>, 71.—Emerson, Trees Massachusetts, 2 ed. i, 167 & t.—Vasey, Cat. Forest Trees, 27.—W. E. Stone in Bull. Torrey Bot. Club, ix, 57.—Ridgway in Proc. U. S. Nat. Mus. 1882, 83.—Burgess in Coulter's Bot. Gazette, vii, 95.—Chapman, Fl. S. States, Suppl. 649.

*Q. rubra*, var. *dissecta*, Lamarek, Diet. i, 120.

*Q. rubra ramosissima*, Marshall, Arbustum, 122.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, 398.

## PIN OAK. SWAMP SPANISH OAK. WATER OAK.

Valley of the Connecticut river, Massachusetts (Amherst, *Stone*), to central New York, south to Delaware and the District of Columbia; southern Wisconsin to eastern Kansas, southern Arkansas, and southeastern Tennessee.

A tree 24 to 30 or, exceptionally, 36 meters (*Ridgway*) in height, with a trunk 0.90 to 1.50 meter in diameter; low, rich soil, generally along the borders of streams and swamps; most common and reaching its greatest development west of the Alleghany mountains.

Wood heavy, hard, very strong, coarse-grained, inclined to check badly in drying; layers of annual growth marked by several rows of large open ducts; medullary rays broad, numerous, conspicuous; color, light brown, the sap-wood rather darker; specific gravity, 0.6938; ash, 0.81; somewhat used for shingles, clapboards, construction, and in cooperage.

280.—*Quercus aquatica*, Walter,

Fl. Caroliniana, 231.—Aiton, Hort. Kew. iii, 357; 2 ed. v, 290.—Abbot, Insects Georgia, ii, t. 59, 79.—Michaux, Hist. Chênes Am. No. 11, t. 19, 20, 21; Fl. Bor.-Am. ii, 193.—Muhlenberg & Willdenow in Neue Schriften Gesell. Nat. Fr. Berlin, iii, 399.—Persoon, Syn. ii, 569.—Desfontaines, Hist. Arb. ii, 509.—Poiret, Suppl. ii, 220.—Michaux f. Hist. Arb. Am. ii, 89, t. 17; N. American Sylva, 3 ed. i, 65, t. 19.—Smith in Rees' Cycl. xxx, No. 52.—Pursh, Fl. Am. Sept. ii, 628.—Barton, Compend. Fl. Philadelph. ii, 168.—Nouveau Duhamel, vii, 167.—Elliott, Sk. ii, 599.—Sprengel, Syst. iii, 862.—Torrey, Compend. Fl. N. States, 357.—Audubon, Birds, t. 24.—Beck, Bot. 328.—Eaton, Manual, 3 ed. 292.—London, Arboretum, iii, 1892, f. 1767.—Eaton & Wright, Bot. 384.—Spach, Hist. Veg. xi, 161.—Darby, Bot. S. States, 510.—Cooper in Smithsonian Rep. 1853, 255.—Chapman, Fl. S. States, 421.—Curtis in Rep. Geological Surv. N. Carolina, 37.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 643; Bot. & Fl. 305.—A. De Candolle, Prodr. xvi<sup>is</sup>, 67.—Örsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 72.—Gray, Manual N. States, 5 ed. 452; Hall's Pl. Texas, 21.—Liebmann, Chênes Am. Trop. t. D.—Young, Bot. Texas, 503.—Vasey, Cat. Forest Trees, 26.

*Q. nigra aquatica*, Lamarek, Dict. i, 721.

*Q. nigra trifida*, Marshall, Arbustum, 121.

? *Q. uliginosa*, Wangenheim, Amer. 80, t. 6, f. 18.

*Q. hemisphaerica*, Willdenow, Spec. iv, 443.—Poiret, Suppl. ii, 628.—Pursh, Fl. Am. Sept. ii, 628.—Smith in Rees' Cycl. xxx, No. 53, 628.—Nuttall, Genera, ii, 214.—Eaton, Manual, 6 ed. 295.—Eaton & Wright, Bot. 385.—Michaux f. N. American Sylva, 3 ed. 187.

*Q. nana*, Willdenow, Spec. 448.—Elliott, Sk. ii, 599.

*Q. aquatica*, vars. *cuneata*, *elongata*, *indivisa*, *attenuata*, Aiton, Hort. Kew. 2 ed. v, 290.

*Q. hemisphaerica*, var. *nana*, Nuttall, Genera, ii, 214.

*Q. aquatica*, var. *hybrida*, Chapman, Fl. S. States, 421.

*Q. nigra*, Koch, Dendrologie, iii<sup>is</sup>, 61, in part.

## WATER OAK. DUCK OAK. POSSUM OAK. PUNK OAK.

Sussex county, Delaware, south through the coast and middle districts to cape Malabar and Tampa bay, Florida, through the Gulf states to the valley of the Colorado river, Texas, and through Arkansas to the valley of the Black river, southeastern Missouri (Poplar Bluffs, *Letterman*), middle Kentucky and Tennessee.

A tree 15 to 24 meters in height, with a trunk 0.60 to 1.20 meter in diameter; generally along streams and bottoms in heavy, undrained soil, or, more rarely, upon uplands; very common and reaching its greatest development along the large streams in the maritime pine belt of the eastern Gulf states.

Wood heavy, hard, strong, coarse-grained, compact; layers of annual growth marked by several rows of large open ducts; medullary rays thin, conspicuous; color, rather light brown, the sap-wood lighter; specific gravity, 0.7244; ash, 0.51; probably not used except as fuel.

281.—*Quercus laurifolia*, Michaux,

Hist. Chênes Am. No. 10, t. 17; Fl. Bor.-Am. ii, 197.—Willdenow, Spec. iv, 427.—Persoon, Syn. ii, 567.—Smith in Rees' Cycl. xxx, No. 14.—Aiton, Hort. Kew. 2 ed. v, 288.—Pursh, Fl. Am. Sept. ii, 627.—Nuttall, Genera, ii, 214.—Nouveau Duhamel, vii, 153.—Elliott, Sk. ii, 597.—Sprengel, Syst. iii, 857.—Eaton, Manual, 6 ed. 294.—London, Arboretum, iii, 1897, f. 1775, 1776.—Eaton & Wright, Bot. 385.—Darby, Bot. S. States, 510.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 36.—Liebmann, Chênes Am. Trop. t. D.—Wood, Cl. Book, 643.—Vasey, Cat. Forest Trees, 26.—Engelmann in Trans. St. Louis Acad. iii, 385, 395.

*Q. laurifolia hybrida*, Michaux, Hist. Chênes Am. No. 10, t. 18.

*Q. laurifolia*, var. *obtusa*, Willdenow, Spec. iv, 428.—Aiton, Hort. Kew. 2 ed. v, 288.—Wood, Cl. Book, 343.

*Q. laurifolia*, var. *acuta*, Willdenow, Spec. iv, 428.—Aiton, Hort. Kew. 2 ed. v, 288.

*Q. obtusa*, Pursh, Fl. Am. Sept. ii, 627.

*Q. Phellos*, var. *laurifolia*, Chapman, Fl. S. States, 420.—Wood, Bot. & Fl. 305.—Young, Bot. Texas, 502.

*Q. aquatica*, var. *laurifolia*, A. De Candolle, Prodr. xvi<sup>is</sup>, 68.

## LAUREL OAK.

North Carolina, south near the coast to Mosquito inlet and cape Romano, Florida, and along the Gulf coast to the shores of Mobile bay.

A large tree, 18 to 24 meters in height, with a trunk 0.90 to 1.20 meter in diameter; most common and reaching its greatest development on the rich hummocks of the Florida coast.

Wood heavy, very strong and hard, coarse-grained, inclined to check in drying; layers of annual growth marked by several rows of rather small open ducts; medullary rays broad, conspicuous; color, dark brown tinged with red, the sap-wood lighter; specific gravity, 0.7673; ash 0.82.

282.—*Quercus heterophylla*, Michaux f.

Hist. Arb. Am. ii, 87, t. 16; N. American Sylva, 3 ed. i, 64, t. 18.—Pursh, Fl. Am. Sept. ii, 627.—Barton, Compend. Fl. Philadelph. ii, 167.—Nuttall, Genera, ii, 214; Sylva, i, 15; 2 ed. i, 24.—Green in Universal Herbal, ii, 442.—Torrey, Compend. Fl. N. States, 357.—Sweet, Cat. 2 ed. 466.—Beck, Bot. 328.—Eaton, Manual, 6 ed. 292.—London, Arboretum, iii, 1894.—Eaton & Wright, Bot. 383.—Gale in Proc. Nat. Inst. 1855, 76, f. 1.—Wood, Cl. Book, 645.—Buckley in Proc. Philadelphia Acad. 1862, 361; 1862, 100.—Gray, Hall's Pl. Texas, 21.—Liebmann, Chênes Am. Trop. t. B.—Meehan in Proc. Philadelphia Acad. 1875, 437, 465; Coulter's Bot. Gazette, vii, 10.—Leidy in Proc. Philadelphia Acad. 1875, 415.—Engelmann in Trans. St. Louis Acad. iii, 385, 391.—Martindale, Notes on the Bartram Oak, 3; Coulter's Bot. Gazette, vi, 303.—Ward in Bull. U. S. Nat. Mus. No. 22, 114.

*Q. aquatica*, var. *heterophylla*, Aiton, Hort. Kew. 2 ed. v, 290.—A. De Candolle, Prodr. xvi<sup>2</sup>, 68.

*Q. nigra*, var. Cooper in Smithsonian Rep. 1858, 255.

*Q. Phellos* × *tinctoria*, Gray, Manual N. States, 4 ed. 406.

*Q. Phellos*, var. Gray, Manual N. States, 5 ed. 453.

*Q. Phellos* × *coccinea*, Engelmann in Trans. St. Louis Acad. iii, 541.

## BARTRAM'S OAK.

New Jersey, Salem and Cumberland counties, "restricted to a line or belt bordering extreme tidal points of streams entering the Delaware river where the alluvial terminates and the upland commences," (*Commons*); Delaware, near Townsend station and Wilmington; North Carolina (*M. A. Curtis* in herb. *Canby*); eastern Texas (*E. Hall*); this perhaps *Q. Durandii*.

A small tree, 12 to 15 meters in height, with a trunk 0.45 to 0.60 meter in diameter; rare and very local.

Wood heavy, hard, very strong, close-grained, compact; layers of annual growth marked by several rows of small open ducts; medullary rays numerous, conspicuous; color, light brown tinged with red, the sap-wood somewhat darker; specific gravity, 0.6834; ash, 0.17.

283.—*Quercus cinerea*, Michaux,

Hist. Chênes Am. No. 8, t. 14; Fl. Bor.-Am. ii, 197.—Willdenow, Spec. iv, 425.—Persoon, Syn. ii, 567.—Poiret, Suppl. ii, 212.—Michaux f. Hist. Arb. Am. ii, 82, t. 14; N. American Sylva, 3 ed. i, 61, t. 16.—Aiton, Hort. Kew. 2 ed. v, 288.—Pursh, Fl. Am. Sept. ii, 626.—Smith in Rees' Cycl. xxx, No. 6.—Nuttall, Genera, ii, 214.—Nouveau Dubamel, vii, 151.—Elliott, Sk. ii, 594.—Sprengel, Syst. iii, 857.—Eaton, Manual, 6 ed. 294.—Eaton & Wright, Bot. 6 ed. 294.—Engelmann & Gray in Jour. Boston Soc. Nat. Hist. v, 262.—Scheele in Rœmer, Texas, 446.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 421.—Curtis in Rep. Geological Surv. N. Carolina, 37.—Wood, Cl. Book, 643; Bot. & Fl. 305.—A. De Candolle, Prodr. xvi<sup>2</sup>, 73.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 73.—Gray, Manual N. States, 5 ed. 452; Hall's Pl. Texas, 21.—Young, Bot. Texas, 502.—Koch, Dendrologie, ii<sup>2</sup>, 58.—Vasey, Cat. Forest Trees, 26.—Engelmann in Trans. St. Louis Acad. iii, 385, 395.

*Q. Prinus*, β. Linnaeus, Spec. 1 ed. 995.

*Q. humilis*, Walter, Fl. Caroliniana, 234.

*Q. Phellos*, var. *cinerea*, Aiton, Hort. Kew. iii, 354.—London, Arboretum, iii, 1895, f. 1773.—Spach, Hist. Veg. xi, 161.

## UPLAND WILLOW OAK. BLUE JACK. SAND JACK.

North Carolina, south near the coast to cape Malabar and Pease creek, Florida, west along the Gulf coast to the valley of the Brazos river, Texas, extending north through eastern Texas to about latitude 33°.

A tree 9 to 15 meters in height, with a trunk rarely exceeding 0.20 meter in diameter; sandy barrens and dry upland ridges.

Wood heavy, hard, strong, close grained, compact; layers of annual growth marked by several rows of not large open ducts; medullary rays distant, thin, conspicuous; color, light brown tinged with red, the sap-wood darker; specific gravity, 0.6420; ash, 1.21.

284.—*Quercus hypoleuca*, Engelmann,

Trans. St. Louis Acad. iii, 384; Wheeler's Rep. vi, 251.—Vasey, Cat. Forest Trees, 26.—Rusby in Bull. Torrey Bot. Club, ix, 78.

*Q. confertifolia*, Torrey, Bot. Mex. Boundary Survey, 207 [not HBK.].—Cooper in Smithsonian Rep. 1858, 261.

Limpia mountains, Texas (*Havard*), valleys of the high mountain ranges of southwestern New Mexico, Santa Rita mountains, Arizona, above 6,000 feet elevation; southward into Sonora.

A small evergreen tree of great beauty, 9 to 15 meters in height, with a trunk sometimes 0.75 meter in diameter; dry, gravelly slopes and summits, the large specimens hollow and defective.

Wood heavy, very strong and hard, close-grained, compact; layers of annual growth marked by few small open ducts; medullary rays broad, conspicuous; color, dark brown, the sap-wood much lighter; specific gravity, 0.8009; ash, 1.34.

285.—*Quercus imbricaria*, Michaux,

Hist. Chênes Am. No. 9, t. 15, 16; Fl. Bor.-Am. ii, 197.—Willdenow, Spec. iv, 423; Enum. Suppl. 64; Berl. Baumz. 338.—Persoon, Syn. ii, 567.—Poiret, Suppl. ii, 214.—Michaux f. Hist. Arb. Am. ii, 78, t. 13; N. American Sylva, 3 ed. i, 60, t. 15.—Aiton, Hort. Kew. 2 ed. v, 288.—Smith in Rees' Cycl. xxx, No. 15.—Pursh, Fl. Am. Sept. ii, 627.—Nuttall, Genera, ii, 214.—Barton, Compend. Fl. Philadelph. ii, 167.—Nouveau Duhamel, vii, 153.—Hayne, Dend. Fl. 155.—Elliott, Sk. ii, 598.—Sprengel, Syst. iii, 857.—Torrey, Compend. Fl. N. States, 357.—Beck, Bot. 328.—Eaton, Manual, 6 ed. 292.—London, Arboretum, iii, 1898, f. 1777.—Eaton & Wright, Bot. 383.—Darby, Bot. S. States, 510.—Torrey & Gray in Pacific R. R. Rep. ii, 130.—Cooper in Smithsonian Rep. 1858, 255.—Brendel in Trans. Illinois Ag. Soc. iii, 623, t. 6.—Chapman, Fl. S. States, 420.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 36.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 643; Bot. & Fl. 305.—A. De Candolle, Prodr. xvi<sup>2</sup>, 63.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 73.—Gray, Manual N. States, 5 ed. 452.—Young, Bot. Texas, 502.—Liebmann, Chênes Am. Trop. t. D, t. xxii, f. 5.—Koch, Dendrologie, ii<sup>2</sup>, 60.—Vasey, Cat. Forest Trees, 26.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Ridgway in Proc. U. S. Nat. Mus. 1882, 80.

*Q. Phellos*, var. *imbricaria*, Spach, Hist. Veg. xi, 160.

## SHINGLE OAK. LAUREL OAK.

Allentown, Lehigh county, Pennsylvania (*Porter*), west through southern Michigan, southern Wisconsin, and southeastern Iowa to southeastern Nebraska and northeastern Kansas, south to northern Georgia and Alabama, middle Tennessee, and northern Arkansas.

A tree 24 to 30 meters in height, with a trunk 0.60 to 0.90 meter in diameter; rich woodlands.

Wood heavy, hard, rather coarse-grained, checking badly in drying; layers of annual growth marked by many rows of large open ducts; medullary rays broad, conspicuous; color, light brown tinged with red, the sap-wood much lighter; specific gravity, 0.7529; ash, 0.43; occasionally used for clapboards, shingles, etc.

286.—*Quercus Phellos*, Linnæus,

Spec. 1 ed. 994.—Lamarek, Dict. i, 722.—Wangenheim, Amer. 76, t. 5, f. 11.—Walter, Fl. Caroliniana, 234.—Aiton, Hort. Kew. iii, 354; 2 ed. v, 287.—Abbot, Insects Georgia, ii, t. 52, 91.—Michaux, Fl. Bor.-Am. ii, 197.—Willdenow, Spec. iv, 423; Enum. 974; Berl. Baumz. 337.—Smith in Rees' Cycl. xxx, No. 7.—Persoon, Syn. ii, 567.—Desfontaines, Hist. Arb. ii, 507.—Michaux f. Hist. Arb. Am. ii, 75, t. 12; N. American Sylva, 3 ed. i, 58, t. 14.—Pursh, Fl. Am. Sept. ii, 625.—Barton, Prodr. Fl. Philadelph. 91; Compend. Fl. Philadelph. ii, 167.—Nuttall, Genera, ii, 214; Sylva, i, 15; 2 ed. i, 17.—Nouveau Duhamel, vii, 150.—Hayne, Dend. Fl. 155.—Elliott, Sk. ii, 593.—Sprengel, Syst. iii, 857.—Torrey, Compend. Fl. N. States, 357; Fl. N. York, ii, 187.—Beck, Bot. 328.—Eaton, Manual, 6 ed. 353.—London, Arboretum, iii, 1894, f. 1774 & t.—Eaton & Wright, Bot. 383.—Spach, Hist. Veg. xi, 160.—Penn. Cycl. xix, 216.—Darby, Bot. S. States, 509.—Cooper in Smithsonian Rep. 1858, 255.—Chapman, Fl. S. States, 420.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 36.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 643; Bot. & Fl. 305.—A. De Candolle, Prodr. xvi<sup>2</sup>, 63.—Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 73.—Gray, Manual N. States, 5 ed. 452; Hall's Pl. Texas, 21.—Young, Bot. Texas, 502.—Koch, Dendrologie, ii<sup>2</sup>, 59.—Vasey, Cat. Forest Trees, 26.—Gartenflora, xxix, 221 & f.—Ridgway in Proc. U. S. Nat. Mus. 83.

*Q. Phellos angustifolia*, Marshall, Arbustum, 124.

*Q. Phellos latifolia*, Marshall, Arbustum, 124.—Loddiges, Cat. ed. 1836.—London, Arboretum, iii, 1895 & t.

*Q. Phellos*, var. *viridis*, Aiton, Hort. Kew. iii, 354.

*Q. Phellos*, var. *humilis*, Pursh, Fl. Am. Sept. ii, 625.

## WILLOW OAK. PEACH OAK.

Tottenville, Staten island, New York, south near the coast to northeastern Florida, through the Gulf states to the valley of the Sabine river, Texas, and through Arkansas to southeastern Missouri, Tennessee, and southern Kentucky.

A tree 18 to 24 meters in height, with a trunk sometimes 0.90 meter in diameter; bottom lands or rich sandy uplands.

Wood heavy, strong, not hard, rather close-grained, compact; layers of annual growth marked by several rows of small open ducts; medullary rays few, distant; color, light brown tinged with red, the sap-wood lighter red; specific gravity 0.7472; ash, 0.50; somewhat used for fellics of wheels, clapboards, in construction, etc.

287.—*Quercus densiflora*, Hooker & Arnott,

Bot. Beechey, 391.—Hooker, Icon. iv, t. 390.—Bentham, Pl. Hartweg. 337.—Nuttall, Sylva, i, 11, t. 5; 2 ed. i, 21, t. 5.—Torrey in Pacific R. R. Rep. iv, 138.—Bot. Wilkes Exped. 458.—Newberry in Pacific R. R. Rep. vi, 31, 89, f. 8.—A. De Candolle, Prodr. xvi, 82.—Bolander in Proc. California Acad. iii, 231.—Vasey, Cat. Forest Trees, 25.—Engelmann in Trans. St. Louis Acad. iii, 389; Bot. California, ii, 99.

*Q. echinacea*, Torrey in Pacific R. R. Rep. iv, 137, t. 14.

*Pasania densiflora*, Ørsted in Saerskitt. Aftryk. af Nat. For. Viden. Meddelt. Nos. 1-6, 1866, 73.

*Q. echinoides*, R. Brown Campst. in Ann. & Mag. Nat. Hist. April, 1871, 2.

TANBARK OAK. CHESTNUT OAK. PEACH OAK.

Valley of the Umpqua river, Oregon, south through the Coast ranges to the Santa Lucia mountains, California. A tree 18 to 24 meters in height, with a trunk 0.60 to 0.90 meter in diameter; rich valleys and banks of streams; most common and reaching its greatest development in the redwood forests of the California coast.

Wood heavy, hard, strong, very close-grained, compact, containing broad bands of small open ducts parallel to the thin, dark, conspicuous medullary rays; color, bright reddish-brown, the thick sap-wood darker brown; specific gravity, 0.6827; ash, 1.49; largely used as fuel.

The bark, rich in tannin, very largely used and preferred to that of any other tree of the Pacific forests for tanning.

NOTE.—The following shrubby species of *Quercus* do not properly find a place in this catalogue:

*Quercus undulata*, Torrey in Ann. Lyc. N. York, ii, 248, t. 4.  
Interior Pacific region from Colorado southward.

*Quercus Breweri*, Engelmann in Bot. California, ii, 96.  
*Q. lobata*, var. *fruticosa*, Engelmann in Trans. St. Louis Acad. iii, 382.  
Western slopes of the high Sierra Nevadas, California.

*Quercus Georgiana*, M. A. Curtis in Chapman's Fl. S. States.  
Stone Mountain, Georgia.

*Quercus myrtifolia*, Willdenow, Sp. iv, 424.  
*Q. Phellos*, var. *arenaria*, Chapman, Fl. S. States, 420.  
*Q. aquatica*, var. *myrtifolia*, A. De Candolle, Prodr. xvi, 68.  
South Atlantic and Gulf coast.

*Quercus ilicifolia*, Wangenheim, Amer. 79, t. 6, f. 17.  
*Q. Banisteri*, Michaux, Hist. Chênes Am. t. 27.  
North Atlantic region.

*Quercus pumila*, Walter, Fl. Caroliana, 234.  
*Q. Phellos pumila*, Michaux, Hist. Chênes Am. t. 15, f. 1.  
*Q. cinerea*, var. *pumila*, Chapman, Fl. S. States, 421.—A. De Candolle, Prodr. 16, 74.  
*Q. cinerea*, var. *sericea*, Engelmann in Trans. St. Louis Acad. iii, 384.  
*Q. sericea*, Willdenow, Spec. 424.  
*Q. Phellos*, var. *sericea*, Aiton, Hort. Kew. iii, 354.  
Pine barrens, South Carolina.

*Quercus dumosa*, Nuttall, Sylva, i, 7.  
*Q. berberidifolia*, Liebm. in Dansk. Vidensk. Selsk. Forhandl. 1854, 172, in part.  
*Q. dumosa*, var. *bullata*, Engelmann in Bot. California, 206.  
*Q. acutidens*, Torrey, Bot. Mex. Boundary Survey, 207, t. 51.

Coast ranges of southern California.

Numerous hybrid or supposed hybrid oaks, variously described by American botanists, are not properly considered here.

288.—*Castanopsis chrysophylla*, A. De Candolle;

Seemann's Jour. Bot. i, 182; Prodr. xvi<sup>2</sup>, 109.—Watson in King's Rep. v, 322; Bot. California, ii, 100.—Gray in Proc. Am. Acad. vii, 401.—Torrey, Bot. Wilkes Exped. 463.—Vasey, Cat. Forest Trees, 27.—Hall in Coulter's Bot. Gazette, ii, 91.

*Castanea chrysophylla*, Douglas in Hooker's London Jour. Bot. ii, 496, t. 16.—Bentham, Pl. Hartweg. 337.—Hooker, Fl. Bor.-Am. ii, 159.—Nuttall, Sylva, i, 21; 2 ed. i, 37.—Bot. Mag. t. 4953.—Torrey in Pacific R. R. Rep. iv, 137; Bot. Mex. Boundary Survey, 205.—Morren in Belg. Hort. vii, 248, t. 240.—Newberry in Pacific R. R. Rep. vi, 26, 89, f. 4.—Fl. des Serres, xii, 3, t. 1184.—Cooper in Smithsonian Rep. 1858, 261.—Kellogg in Proc. California Acad. ii, 280.—Bolander in Proc. California Acad. iii, 231.—Engelmann in Wheeler's Rep. vi, 375.—Shingles in London Gard. Chronicle, 1882, 716.

*Castanea chrysophylla*, var. *minor*, Bentham, Pl. Hartweg. 337.

*Castanea sempervirens*, Kellogg in Proc. California Acad. i, 71.

*C. chrysophylla*, var. *minor*, A. De Candolle, Prodr. xvi<sup>2</sup>, 110.

*C. chrysophylla*, var. *pumila*, Vasey, Cat. Forest Trees, 27.

## CHINQUAPIN.

Cascade mountains, Oregon, below 4,000 feet elevation, south along the western slopes of the Sierra Nevadas, and through the California Coast ranges to the San Bernardino and San Jacinto mountains.

A tree 15 to 24 meters in height, with a trunk 0.30 to 0.90 meter in diameter, or at high elevations and toward its southern limits reduced to a low shrub; most common and reaching its greatest development in the Coast Range valleys of northern California; at its southern limits rarely below 10,000 feet elevation.

Wood light, soft, not strong, close-grained, compact; layers of annual growth marked by a single row of rather large open ducts; medullary rays numerous, obscure; color, light brown tinged with red, the sap-wood lighter; specific gravity, 0.5574; ash, 0.35; in southern Oregon occasionally used in the manufacture of plows and other agricultural implements.

289.—*Castanea pumila*, Miller,

Diet. No. 2.—Lamarck, Dict. i, 708.—Michaux, Fl. Bor.-Am. ii, 193.—Willdenow, Spec. iv, 461; Enum. 980; Berl. Baumz. 78.—Smith in Rees' Cycl. xiv, No. 2.—Nouvean Duhamel, iii, 79.—Persoon, Syn. ii, 572.—Desfontaines, Hist. Arb. ii, 500.—Michaux f. Hist. Arb. Am. ii, 166, t. 7; N. American Sylva, 3 ed. iii, 16, t. 105.—Aiton, Hort. Kew. 2 ed. v, 298.—Pursh, Fl. Am. Sept. ii, 624.—Rafinesque, Fl. Ludoviciana, 159; New Fl. & Bot. i, 83.—Nuttall, Genera, ii, 217; Am. Phil. Soc. 2 ser. v, 168.—Hayne, Dend. Fl. 165.—James in Long's Exped. ii, 287.—Elliott, Sk. ii, 615.—Torrey, Compend. Fl. N. States, 355; Fl. N. York, ii, 196.—Audubon, Birds, t. 85.—Beck, Bot. 332.—Eaton, Manual, 6 ed. 84.—Penn. Cycl. vi, 350.—Loudon, Arboretum, iii, 2002, f. 1927, 1928.—Eaton & Wright, Bot. 184.—Spach, Hist. Veg. xi, 192.—Darlington, Fl. Cestrica, 3 ed. 270.—Darby, Bot. S. States, 512.—Cooper in Smithsonian Rep. 1858, 256.—Chapman, Fl. S. States, 424.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 47.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 646; Bot. & Fl. 307.—Porcher, Resources S. Forests, 237.—A. De Candolle, Prodr. xvi<sup>2</sup>, 115.—Gray, Manual N. States, 5 ed. 455.—Young, Bot. Texas, 508.—Koch, Dendrologie, ii<sup>2</sup>, 24.—Vasey, Cat. Forest Trees, 27.—Butler in Coulter's Bot. Gazette, iii, 17.

*Fagus pumila*, Linnæus, Spec. 1 ed. 998.—Du Roi, Harbk. i, 175.—Wangenheim, Amer. 57, t. 19, f. 44.—Walter, Fl. Caroliniana, 233.—Aiton, Hort. Kew. iii, 361.—Abbot, Insects Georgia, ii, t. 57.

*Fagus Castanea pumila*, Marshall, Arbustum, 47.

*Fagus pumila*, var. *precocx*, Walter, Fl. Caroliniana, 233.

*C. nana*, Muhlenberg, Cat. 86.—Elliott, Sk. ii, 615.—Rafinesque, New Fl. & Bot. i, 83.—Darby, Bot. S. States, 512.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 47.—Lesquereux in Owen's 2d Rep. Arkansas, 388.

*C. alnifolia*, Nuttall, Genera, ii, 217; Sylva, i, 19, t. 6; 2 ed. i, 36, t. 6.

*C. vesca*, Lesquereux in Owen's 2d Rep. Arkansas, 388 [not Gærtner].

## CHINQUAPIN.

Lancaster county, Pennsylvania, and the valley of the lower Wabash river, Indiana, south and southwest to northern Florida and the valley of the Neches river, Texas.

A tree sometimes 15 meters in height, with a trunk 0.30 to 1.05 meter in diameter, or often, especially in the Atlantic states, reduced to a low shrub; rich hillsides and borders of swamps; most common and reaching its greatest development in southern Arkansas.

Wood light, hard, strong, coarse-grained, durable in contact with the ground, liable to check in drying; layers of annual growth marked by many rows of large open ducts; medullary rays numerous, obscure; color, dark brown, the sap-wood hardly distinguishable; specific gravity, 0.5887; ash, 0.12; used for posts, rails, railway ties, etc.

The small nuts sweet and edible.

290.—*Castanea vulgaris*, var. *Americana*, A. De Candolle,

Prodr. xvi<sup>2</sup>, 114.—Schneck in Coulter's Bot. Gazette, vi, 159.—Bell in Geological Rep. Canada, 1879-'80, 53<sup>c</sup>.—Ridgway in Proc. U. S. Nat. Mus. 1882, 84.

*Fagus Castanea dentata*, Marshall, Arbustum, 46.

*Fagus Castanea*, Wangenheim, Amer. 47 [not Linnaeus].—Walter, Fl. Caroliniana, 233.—Aiton, Hort. Kew. iii, 361, in part.—Lamarek, Ill. iii, 366, t. 782, in part.

*C. vesca*, var. *Americana*, Michaux, Fl. Bor.-Am. ii, 193.—Persoon, Syn. ii, 572.—Barton, Prodr. Fl. Philadelph. 90.—Pursh, Fl. Am. Sept. ii, 624.—Eaton, Manual, 109; 6 ed. 84.—Nuttall, Genera, ii, 217.—Elliott, Sk. ii, 614.—Torrey, Compend. Fl. N. States, 355; Fl. N. York, ii, 195, t. 111.—London, Arboretum, iii, 1984.—Eaton & Wright, Bot. 184.—Emerson, Trees Massachusetts, 164, 2 ed. i, 187 & t.—Porcher, Resources S. Forests, 238. Vasey, Cat. Forest Trees, 27.—Rudkin in Bull. Torrey Bot. Club, vii, 81.

*C. Americana*, Rafinesque, New Fl. & Bot. i, 82.—Willdenow, Enum. Suppl. 64.—Nuttall, Sylva, i, 24; 2 ed. i, 38.—Spach, Hist. Veg. xi, 191.—Cooper in Smithsonian Rep. 1858, 256.—Koch, Dendrologie, ii<sup>2</sup>, 23.—Martindale in Proc. Philadelphia Acad. 1880, 2.

*C. vesca*, Willdenow, Spec. iv, 460, in part.—Desfontaines, Hist. Arb. ii, 500, in part.—Michaux f. Hist. Arb. Am. ii, 151, t. 6; N. American Sylva, 3 ed. iii, 11, t. 104 [not Gertner].—Hayne, Dend. Fl. 165, in part.—Sprengel, Syst. iii, 856, in part.—Beck, Bot. 332.—Penn. Cycl. vi, 350.—Bigelow, Fl. Boston. 3 ed. 224.—Darlington, Fl. Cestricea, 3 ed. 270.—Darby, Bot. S. States, 511.—Chapman, Fl. S. States, 424.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 46.—Wood, Cl. Book, 646; Bot. & Fl. 306.—Gray, Manual N. States, 5 ed. 455.

## CHESTNUT.

Southern Maine to the valley of the Winooski river, Vermont, southern Ontario and southern Michigan, south through the northern states to Delaware and southern Indiana, and along the Alleghany mountains to northern Alabama, extending west to middle Kentucky and Tennessee.

A large tree, 24 to 30 meters in height, with a trunk 1.80 to 4 meters in diameter; rich woods and hillsides; very common and reaching its greatest development on the western slopes of the southern Alleghany mountains.

Wood light, soft, not strong, coarse-grained, liable to check and warp in drying, easily split, very durable in contact with the soil; layers of annual growth marked by many rows of large open ducts; medullary rays numerous, obscure; color, brown, the sap-wood lighter; specific gravity, 0.4504; ash, 0.18; largely used in cabinet-making, for railway ties, posts, fencing, etc.

The fruit, although smaller, superior in sweetness and flavor to that of the European chestnut.

An infusion or fluid extract of the dried leaves is successfully employed in the treatment of whooping-cough and other pectoral affections (*U. S. Dispensatory*, 14 ed. 245.—*Nat. Dispensatory*, 2 ed. 364).

291.—*Fagus ferruginea*, Aiton,

Hort. Kew. iii, 362; 2 ed. v, 298.—Abbot, Insects Georgia, ii, t. 75.—Willdenow, Spec. iv, 460; Enum. 980; Berl. Baumz. 140.—Persoon, Syn. ii, 571.—Desfontaines, Hist. Arb. ii, 496.—Michaux f. Hist. Arb. Am. ii, 174, t. 9; N. American Sylva, 3 ed. iii, 21, t. 106.—Smith in Rees' Cycl. xiv, No. 4.—Pursh, Fl. Am. Sept. ii, 624.—Barton, Prodr. Fl. Philadelph. 90; Compend. Fl. Philadelph. ii, 174.—Eaton, Manual, 108; 6 ed. 145.—Sprengel, Syst. iii, 856.—Torrey, Compend. Fl. N. States, 354; Fl. N. York, ii, 194, t. 110.—Beck, Bot. 333.—Eaton, Manual, 6 ed. 145.—London, Arboretum, iii, 1980, f. 1917.—Hooker, Fl. Bor.-Am. ii, 159.—Eaton & Wright, Bot. 244.—Bigelow, Fl. Boston. 3 ed. 374.—Darlington, Fl. Cestricea, 3 ed. 271.—Cooper in Smithsonian Rep. 1858, 256.—Chapman, Fl. S. States, 425.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 47.—Wood, Bot. & Fl. 307.—A. De Candolle, Prodr. xvi<sup>2</sup>, 118.—Gray, Manual N. States, 5 ed. 455.—Koch, Dendrologie, ii<sup>2</sup>, 19.—Vasey, Cat. Forest Trees, 27.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Sears in Bull. Essex Inst. xiii, 179.—Bell in Geological Rep. Canada, 1879-'80, 52<sup>c</sup>.—Ridgway in Proc. U. S. Nat. Mus. 1882, 85.

*F. sylvatica atropurpurea*, Marshall, Arbustum, 46.

*F. Americana latifolia*, Wangenheim, Amer. 80, t. 29, f. 55.—London, Arboretum, iii, 1980, f. 1916.

*F. sylvatica*, Walter, Fl. Caroliniana, 233 [not Linnaeus].—Pursh, Fl. Am. Sept. ii, 624.—Beck, Bot. 333.—Darlington, Fl. Cestricea, 2 ed. 538.—Darby, Bot. S. States, 512.

*F. sylvestris*, Michaux, Fl. Bor. Am. ii, 194.—Michaux f. Hist. Arb. Am. ii, 170, t. 8; N. American Sylva, 3 ed. iii, 18, t. 107.—Hooker, Fl. Bor.-Am. ii, 159.—Lesquereux in Owen's 2d Rep. Arkansas, 388.

*F. alba*, Rafinesque, Fl. Ludoviciana, 131.

*F. sylvatica*, var. *Americana*, Nuttall, Genera, ii, 216.—Barton, Compend. Fl. Philadelph. ii, 174.—Elliott, Sk. ii, 613.—Eaton, Manual, 6 ed. 145.—London, Arboretum, iii, 1953.—Eaton & Wright, Bot. 244.—Emerson, Trees Massachusetts, 153; 2 ed. i, 189 & t.—Wood, Cl. Book, 647.—Porcher, Resources S. Forests, 235.

*F. Americana*, Sweet, Hort. Brit.—Spach, Hist. Veg. xi, 201.

*F. ferruginea*, var. *Caroliniana*, London, Arboretum, iii, 1980, f. 1915.

## BEECH.

Nova Scotia and the valley of the Restegouche river to the northern shores of Lake Huron and northern Wisconsin, south to the Chattahoochee region of western Florida and the valley of the Trinity river, Texas, west to eastern Illinois, southeastern Missouri, and Madison county, Arkansas (*Letterman*).

A large tree, 24 to 30 or, exceptionally, 34 meters (*Ridgway*) in height, with a trunk 0.90 to 1.20 meter in diameter; rich woods, or at the south sometimes in bottom lands or the dryer portions of swamps, reaching its greatest development upon the "bluff" formations of the lower Mississippi basin; very common.

Wood very hard, strong, tough, very close grained, not durable in contact with the soil, inclined to check in drying, difficult to season, susceptible of a beautiful polish; medullary rays broad, very conspicuous; color, varying greatly with soil and situation, dark red, or often lighter, the sap-wood nearly white; specific gravity, 0.6883; ash, 0.51; largely used in the manufacture of chairs, shoe-last, plane-stocks, handles, etc., and for fuel.

292.—*Ostrya Virginica*, Willdenow,

Spec. iv, 469; Enum. 982; Berl. Baumz. 260.—Persoon, Syn. ii, 573.—Aiton, Hort. Kew. 2 ed. v, 302.—Pursh, Fl. Am. Sept. ii, 623.—Eaton, Manual, 109; 6 ed. 244.—Nuttall, Genera, ii, 219.—Hayne, Dend. Fl. 169.—Elliott, Sk. ii, 618.—Sprengel, Syst. iii, 856.—Torrey, Compend. Fl. N. States, 356; Nicolle's Rep. 160; Fl. N. York, ii, 185, t. 102.—Audubon, Birds, t. 40.—Loudon, Arboretum, iii, 2015, f. 1940.—Hooker, Fl. Bor.-Am. ii, 160.—Eaton & Wright, Bot. 336.—Bigelow, Fl. Boston. 3 ed. 383.—Spach in Ann. Sci. Nat. 2 ser. xvi, 246; Hist. Veg. xi, 218.—Emerson, Trees Massachusetts, 177; 2 ed. i, 201 & t.—Parry in Owen's Rep. 618.—Darlington, Fl. Cestricea, 3 ed. 274.—Darby, Bot. S. States, 509.—Cooper in Smithsonian Rep. 256.—Chapman, Fl. S. States, 426.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 75.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 647; Bot. & Fl. 307.—Porcher, Resources S. Forests, 233.—A. De Candolle, Prodr. xvi<sup>2</sup>, 125.—Gray, Manual N. States, 5 ed. 456.—Young, Bot. Texas, 510.—Vasey, Cat. Forest Trees, 27.—Sargent in Am. Nat. xi, 683.—Sears in Bull. Essex Inst. xiii, 179.—Ridgway in Proc. U. S. Nat. Mus. 85.

*Carpinus Ostrya*, Linnæus, Spec. 1 ed. 998, in part.—Du Roi, Harbk. i, 130.—Wangenheim, Amer. 48.—Marshall, Arbustum, 25.—Mönch, Meth. 694.—Abbot, Insects Georgia, ii, t. 76.—Nouveau Duhamel, ii, 200.—Michaux f. Hist. Arb. Am. iii, 53, t. 7; N. American Sylva, 3 ed. iii, 27, t. 109.

*Carpinus Virginiana*, Miller, Dict. 7 ed. No. 4.—Lamarck, Dict. i, 708; Wangenheim, Amer. 49.—Nouveau Duhamel, ii, 201.—Desfontaines, Hist. Arb. ii, 493.—Smith in Rees' Cycl. vii, No. 5.

*Carpinus triflora*, Mönch, Meth. 394.

*Carpinus Ostrya*, var. *Americana*, Michaux, Fl. Bor.-Am. ii, 202.

*O. Virginica*, var. *glandulosa*, Spach in Ann. Sci. Nat. 2 ser. xvi, 246; Hist. Veg. xi, 218.

*O. Virginica*, var. *eglandulosa*, Spach, in Ann. Sci. Nat. 2 ser. xvi, 246; Hist. Veg. xi, 218.

*O. Virginiana*, Koch, Dendrologie, ii<sup>2</sup>, 6.

## HOP HORNBEAM. IRON WOOD. LEVER WOOD.

Bay of Chaleur, through the valleys of the Saint Lawrence and the lower Ottawa rivers, along the northern shore of Lake Huron to northern Minnesota, south through the northern states and along the Allegheny mountains to the Chattahoochee region of western Florida, and through eastern Iowa, southeastern Missouri, and Arkansas to eastern Kansas, the Indian territory, and eastern Texas.

A small tree, 9 to 15 meters in height, with a trunk 0.30 to 0.60 meter in diameter; generally on dry, gravelly hillsides and knolls, reaching its greatest development in southern Arkansas; common.

Wood heavy, very strong and hard, tough, very close-grained, compact, susceptible of a beautiful polish, very durable in contact with the soil; medullary rays numerous, obscure; color, light brown tinged with red, or, like the sap-wood, often nearly white; specific gravity, 0.8284; ash, 0.50; used for posts, levers, handles of tools, etc.

293.—*Carpinus Caroliniana*, Walter,

Fl. Caroliniana, 238.—A. De Candolle, Prodr. xvi<sup>2</sup>, 126.—Koch, Dendrologie, ii<sup>2</sup>, 4.—Sears in Bull. Essex Inst. xviii, 180.—Ridgway in Proc. U. S. Nat. Mus. 1882, 85.

*C. Americana*, Lamarck, Dict. iv, 708; Suppl. ii, 202.—Michaux, Fl. Bor.-Am. ii, 201.—Willdenow, Spec. iv, 468; Enum. Suppl. 64; Berl. Baumz. 75.—Persoon, Syn. ii, 573.—Michaux f. Hist. Arb. Am. iii, 57, t. 8; N. American Sylva, 3 ed. iii, 26, t. 108.—Pursh, Fl. Am. Sept. ii, 623.—Aiton, Hort. Kew. 2 ed. v, 301.—Eaton, Manual, 109; 6 ed. 82.—Barton, Prodr. Fl. Philadelph. 91; Compend. Fl. Philadelph. ii, 176.—Nuttall, Genera, ii, 218.—Hayne, Dend. Fl. 168.—Elliott, Sk. ii, 618.—Watson, Dend. Brit. ii, t. 157.—Sprengel, Syst. iii, 854.—Guimpel, Otto & Hayne, Abb. Holz. 107, t. 84.—Torrey, Compend. Fl. N. States, 356; Fl. N. York, ii, 185, t. 103.—Penn. Cycl. iv, 315.—London, Arboretum, iii, 2013, f. 1936.—Hooker, Fl. Bor.-Am. ii, 160.—Eaton & Wright, Bot. 182.—Bigelow, Fl. Boston. 3 ed. 383.—Spach in Ann. Sci. Nat. 2 ser. xvi, 252; Hist. Veg. xi, 224.—Emerson, Trees Massachusetts, 174; 2 ed. i, 198 & t.—Parry in Owen's Rep. 618.—Darlington, Fl. Cestricea, 3 ed. 273.—Darby, Bot. S. States, 508.—Cooper in Smithsonian Rep. 1858, 256.—Chapman, Fl. S. States, 425.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 75.—Lesquereux in Owen's 2d Rep. Arkansas, 388.—Wood, Cl. Book, 648; Bot. & Fl. 307.—Gray, Manual N. States, 5 ed. 457; Hall's Fl. Texas, 21.—Young, Bot. Texas, 509.—Vasey, Cat. Forest Trees, 27.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Bell in Geological Rep. Canada, 1879-'80, 52c.

*C. Betulus Virginiana*, Marshall, Arbustum, 25.

HORNBEAM. BLUE BEECH. WATER BEECH. IRON WOOD.

Nova Scotia, southern New Brunswick, northern shores of Georgian bay, southern peninsula of Michigan to northern Minnesota (lake Pokegama, *Garrison*), south to cape Malabar and Tampa bay, Florida, and the valley of the Trinity river, Texas, west to central Iowa, eastern Kansas, and the valley of the Poteau river, Indian territory.

A small tree, 9 to 15 meters in height, with a trunk sometimes 0.60 to 0.90 meter in diameter, or at the north much smaller and often reduced to a low shrub; borders of streams and swamps, in moist soil; most common and reaching its greatest development along the western slopes of the southern Alleghany mountains and in southern Arkansas and eastern Texas.

Wood heavy, very strong and hard, close-grained, inclined to check in drying; medullary rays numerous, broad; color, light brown, the thick sap-wood nearly white; specific gravity, 0.7286; ash, 0.83; sometimes used for levers, handles of tools, etc.

BETULACEÆ.

294.—*Betula alba*, var. *populifolia*, Spach,

Ann. Sci. Nat. 2 ser. xv, 187; Hist. Veg. xi, 233.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 19.—Regel in Mem. Soc. Nat. Moscow, xix, 76, t. 4, f. 19-28; Gray, Manual N. States, 5 ed. 459.—Vasey, Cat. Forest Trees, 28.—Macoun in Geological Rep. Canada, 1879-'80, 55c.

*B. lenta*, Du Roi, Harbk. i, 92 [not Linnaeus].—Wangenheim, Amer. 45, t. 29, f. 38.

*B. populifolia*, Marshall, Arbustum, 19.—Aiton, Hort. Kew. iii, 336; 2 ed. v, 299.—Willdenow, Berl. Baumz. 1 ed. 37, t. 2, f. 5; Spec. iv, 463.—Persoon, Syn. ii, 572.—Desfontaines, Hist. Arb. ii, 476.—Nouveau Duhamel, iii, 204.—Poirer, Suppl. i, 687.—Michaux f. Hist. Arb. Am. ii, 139, t. 2; N. American Sylva, 3 ed. ii, 78, t. 71.—Pursh, Fl. Am. Sept. ii, 620.—Smith in Rees' Cycl. iv, No. 8.—Barton, Prodr. Fl. Philadelph. 92; Compend. Fl. Philadelph. ii, 175.—Eaton, Manual, 109; 6 ed. 53.—Nuttall, Genera, ii, 218; Sylva, i, 25; 2 ed. i, 42.—Hayne, Dend. Fl. 166.—Sprengel, Syst. iii, 854.—Watson, Dend. Brit. ii, 151.—Torrey, Compend. Fl. N. States, 355; Fl. N. York, ii, 199, t. 112.—London, Arboretum, iii, 1707, f. 1560.—Hooker, Fl. Bor.-Am. ii, 155.—Eaton & Wright, Bot. 156.—Bigelow, Fl. Boston. 3 ed. 381.—Emerson, Trees Massachusetts, 213; 2 ed. i, 243 & t.—Gray, Manual N. States, 1 ed. 421.—Cooper in Smithsonian Rep. 1858, 256.—Wood, Cl. Book, 649; Bot. & Fl. 308.—Koch, Dendrologie, ii, 646.

*B. acuminata*, Ehrhart, Beitr. vi, 98.—Moench, Meth. 693.

*B. alba*, subspecies *populifolia*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 399; De Candolle, Prodr. xvi<sup>2</sup>, 164.

WHITE BIRCH. OLD-FIELD BIRCH. GRAY BIRCH.

New Brunswick and the valley of the lower Saint Lawrence river to the southern shores of lake Ontario, south, generally near the coast, to New Castle county, Delaware.

A small, short-lived tree of rapid growth, 6 to 9 meters in height, with a trunk 0.30 to 0.45 meter in diameter; dry, gravelly, barren soil or borders of swamps, now generally springing up upon abandoned or burned land in eastern New England.

Wood light, soft, not strong, close-grained, liable to check in drying, not durable; medullary rays numerous, obscure; color, light brown, the sap-wood nearly white; specific gravity, 0.5760; ash, 0.29; largely used in the manufacture of spools, shoe-pegs, wood pulp, etc., for hoop-poles and fuel.

The bark and leaves, as well as those of *B. papyrifera* and *B. lenta*, are popularly esteemed as a remedy for various chronic diseases of the skin, bladder, etc., and for rheumatic and gouty complaints; the empyreumatic oil of birch obtained from the inner bark by distillation is used externally and internally for the same purposes (*U. S. Dispensatory*, 14 ed. 1592.—*Nat. Dispensatory*, 2 ed. 287); the bark occasionally used domestically in the manufacture of ink.

295.—*Betula papyrifera*, Marshall,

Arbustum, 19.—Michaux, Fl. Bor.-Am. ii, 180.

*B. papyracea*, Aiton, Hort. Kew. iii, 337; 2 ed. v, 300.—Willdenow, Spec. iv, 464; Enum. 981; Berl. Baumz. 58, t. 2, f. 1.—Nouveau Duhamel, iii, 205.—Persoon, Syn. ii, 572.—Desfontaines, Hist. Arb. ii, 477.—Poirer, Suppl. i, 688.—Michaux f. Hist. Arb. Am. ii, 133, t. 1; N. American Sylva, 3 ed. ii, 70, t. 69.—Smith in Rees' Cycl. iv, No. 9.—Pursh, Fl. Am. Sept. ii, 621.—B. S. Barton, Bot. Appx. 34, t. 27, f. 1.—Eaton, Manual, 109; 6 ed. 53.—Barton, Compend. Fl. Philadelph. ii, 175.—Nuttall, Genera, ii, 218; Sylva, i, 25; 2 ed. i, 42.—Hayne, Dend. Fl. 167.—Watson, Dend. Brit. ii, t. 152.—Sprengel, Syst. iii, 854.—Torrey, Compend. Fl. N. States, 355; Fl. N. York, ii, 199.—Audubon, Birds, t. 88.—London, Arboretum, iii, 1708, f. 1561 & t.—Hooker, Fl. Bor.-Am. ii, 155.—Eaton & Wright, Bot. 156.—Bigelow, Fl. Boston. 3 ed. 381.—Penn. Cycl. ii, 349.—Emerson, Trees Massachusetts, 210; 2 ed. i, 239 & t.—Parry in Owen's Rep. 618.—Richardson, Arctic Exped. 437.—Cooper in Smithsonian Rep. 1858, 256.—Hooker f. in Trans. Linnæan Soc. xxiii<sup>2</sup>, 300, 339.—Wood, Cl. Book, 649; Bot. & Fl. 308.—Gray, Manual N. States, 5 ed. 459.—Koch, Dendrologie, ii, 645.—Vasey, Cat. Forest Trees, 28.—Macoun in Geological Rep. Canada, 1875-'76, 210.—Sears in Bull. Essex Inst. xiii, 180.—Bell in Geological Rep. Canada, 1879-'80, 45c.

- B. nigra*, Loiseleur in Nouveau Duhamel, ii, t. 51 [not Linnæus].
- B. grandis*, Schrader in Ind. Hort. Goett. 1833, 2.
- B. rubra*, Loddiges, Cat. ed. 1836.
- B. Canadensis*, Loddiges, Cat. ed. 1836.
- B. alba*, var. *papyrifera*, Spach. in Ann. Sci. Nat. 2ser. xv, 188; Hist. Veg. xi, 234.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 19.—Regel in Mem. Soc. Nat. Moscow, xix, 81, t. 5, f. 5-16.
- B. cordifolia*, Regel in Mem. Soc. Nat. Moscow, xix, 86, t. 12, f. 29-36.
- B. alba*, subspecies *papyrifera*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 401; De Candolle, Prodr. xvi<sup>2</sup>, 166.
- B. alba*, subspecies *papyrifera*, var. *cordifolia*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 401; De Candolle, Prodr. xvi<sup>2</sup>, 166.
- B. alba*, subspecies *papyrifera*, var. *communis*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 401; De Candolle, Prodr. xvi<sup>2</sup>, 166.
- B. alba*, subspecies *commutata*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 401; De Candolle, Prodr. xvi<sup>2</sup>, 166.
- B. occidentalis*, Lyall in Jour. Linnæan Soc. vii, 134 [not Hooker].
- B. alba*, var. *populifolia*, Winchell in Ludlow's Rep. Black Hills, 67 [not Spach].

## CANOE BIRCH. WHITE BIRCH. PAPER BIRCH.

Northern Newfoundland and Labrador to the southern shores of Hudson bay and northwest to the Great Bear lake and the valley of the Yukon river, Alaska, south, in the Atlantic region to Wading river, Long island, the mountains of northern Pennsylvania, Clear lake, Montcalm county, Michigan, northeastern Illinois and Saint Cloud, Minnesota; in the Pacific region south to the Black hills of Dakota (*R. Douglas*), the Mullen trail of the Bitter Root mountains and Flathead lake, Montana, the neighborhood of Fort Colville, Washington territory (*Watson*), and the valley of the lower Fraser river, British Columbia (*Engelmann & Sargent*).

A tree 18 to 24 meters in height, with a trunk 0.60 to 0.90 meter in diameter; rich woodlands and banks of streams; very common in the northern Atlantic region and reaching a higher latitude than any deciduous tree of the American forest.

Wood light, strong, hard, tough, very close-grained, compact; medullary rays numerous, obscure; color, brown tinged with red, the sap-wood nearly white; specific gravity, 0.5955; ash, 0.25; largely used in the manufacture of spools, shoe-lasts and pegs, in turnery, for fuel, wood-pulp, etc.

The very tough, durable bark easily separated into thin layers, impervious to water, is largely used in the manufacture of canoes, tents, etc.

296.—*Betula occidentalis*, Hooker,

Fl. Bor.-Am. ii, 155.—Spach in Ann. Sci. Nat. 2 ser. xv, 197.—Nuttall, Sylva, i, 22, t. 7; 2 ed. i, 40, t. 7.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 20.—Torrey in Fremont's Rep. 97; Bot. Wilkes Exped. 466.—Nowberry in Pacific R. R. Rep. vi, 89.—Cooper in Smithsonian Rep. 1858, 261; Am. Nat. iii, 408.—Regel in Mem. Soc. Nat. Moscow, xix, 131, t. 15, f. 35.—Porter in Hayden's Rep. 1871, 493.—Watson in King's Rep. v, 323, t. 35; Pl. Wheeler, 17; Bot. California, ii, 79.—Porter & Hayden, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 127.—Rothrock in Pl. Wheeler. 50; Wheeler's Rep. vi, 239.—Vasey, Cat. Forest Trees, 28.—Macoun in Geological Rep. Canada, 1875-76, 210.—G. M. Dawson in Canadian Nat. new ser. ix, 331.

*B. alba*, subspecies *occidentalis typica*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 400; De Candolle, Prodr. xvi<sup>2</sup>, 165.

## BLACK BIRCH.

British Columbia, south to the Mount Shasta region (*Strawberry vale*) and the eastern cañons of the Sierra Nevadas above Owen's valley (*Lemmon*), California, and through the interior ranges and the Rocky mountains to Utah and northern New Mexico.

A small tree, 8 to 12 meters in height, with a trunk sometimes 0.30 to 0.45 meter in diameter; mountain cañons and along streams, in moist soil, often throwing up several stems from the ground and forming dense thickets.

Wood soft, strong, brittle, close-grained, compact; medullary rays numerous, obscure; color, light brown, the sap-wood lighter; specific gravity, 0.6030; ash, 0.30; somewhat used for fencing, fuel, etc.

297.—*Betula lutea*, Michaux f.

Hist. Arb. Am. ii, 152, t. 5; N. American Sylva, 3 ed. ii, 82, t. 73.—Spach in Ann. Sci. Nat. 2 ser. xv, 191; Hist. Veg. xi, 243.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 20.—Wood, Bot. & Fl. 308.—Gray, Manual N. States, 5 ed. 459.—Koch, Dendrologie, ii, 640.—Vasey, Cat. Forest Trees, 28.—Sears in Bull. Essex Inst. xiii, 180.

*B. excelsa*, Pursh, Fl. Am. Sept. ii, 621 [not Aiton].—Nuttall, Genera, ii, 218.—Sprengel, Syst. iii, 854.—Torrey, Compend. Fl. N. States, 355; Fl. N. York, ii, 200.—Eaton, Manual, 6 ed. 53.—Loudon, Arboretum, iii, 1711, f. 1564, 1565 & t.—Hooker, Fl. Bor.-Am. ii, 156.—Eaton & Wright, Bot. 156.—Bigelow, Fl. Boston, 3 ed. 382.—Lindley in Penn. Cycl. ii, 349.—Gray, Manual N. States, 1 ed. 422.—Emerson, Trees Massachusetts, 206; 2 ed. i, 235 & t.—Richardson, Arctic Exped. 438.—Cooper in Smithsonian Rep. 1858, 256.—Chapman, Fl. S. States, 428.—Curtis in Rep. Geological Surv. N. Carolina, 1830, iii, 74.—Wood, Cl. Book, 648.—Bell in Geological Rep. Canada, 1879-'80, 50c.

*B. lenta*, Regel in Mem. Soc. Nat. Moscow, xix, 125, in part; Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 417, in part; De Candolle, Prodr. xvi<sup>2</sup>, 179, in part.

## YELLOW BIRCH. GRAY BIRCH.

Newfoundland, northern shores of the gulf of Saint Lawrence to Abittibi lake and the western shores of lake Superior and Rainy lake, south through the northern states to Delaware and southern Minnesota, and along the Alleghany mountains to the high peaks of North Carolina and Tennessee.

One of the largest and most valuable deciduous trees of the northern New England and Canadian forests, often 21 to 29 meters in height, with a trunk 0.90 to 1.20 meter in diameter; rich woodlands; common.

Wood heavy, very strong and hard, very close-grained, compact, satiny, susceptible of a beautiful polish; medullary rays numerous, obscure; color, light brown tinged with red, the heavier sap-wood nearly white; specific gravity, 0.6553; ash, 0.31; largely used for fuel, in the manufacture of furniture, button and tassel molds, pill and match boxes, and for the hubs of wheels.

298.—*Betula nigra*, Linnæus,

Spec. 1 ed. 982.—Marshall, Arbustum, 18.—Walter, Fl. Caroliniana, 231.—Aiton, Hort. Kew. iii, 336; 2 ed. v, 299.—Gærtner, Fruct. ii, 54, t. 90, f. 1.—Willdenow, Spec. iv, 464; Enum. 931; Berl. Baumz. 56.—Nouveau Duhamel, iii, 203, t. 51.—Persoon, Syn. ii, 572.—Desfontaines, Hist. Arb. ii, 477.—Smith in Rees' Cycl. iv, No. 2.—Pursh, Fl. Am. Sept. ii, 621.—Nuttall, Genera, ii, 218.—Hayne, Dend. Fl. 166.—Lamarek, Ill. iii, 350, t. 760, f. 2.—Elliott, Sk. ii, 616.—Watson, Dend. Brit. ii, t. 153.—Sprengel, Syst. ii, 854.—Torrey, Compend. Fl. N. States, 355; Fl. N. York, ii, 201.—Beck, Bot. 325.—Loudon, Arboretum, iii, 1710, f. 1562, 1563 & t.—Penn. Cycl. ii, 149.—Emerson, Trees Massachusetts 208; 2 ed. i, 237.—Darlington, Fl. Cestrica, 3 ed. 275.—Darby, Bot. S. States, 508.—Cooper in Smithsonian Rep. 1858, 256.—Chapman, Fl. S. States, 428.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 73.—Regel in Mem. Soc. Nat. Moscow, xix, 118, t. 12, f. 1-12; Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 412; De Candolle, Prodr. xvi<sup>2</sup>, 175.—Lesquereux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 649; Bot. & Fl. 308.—Porcher, Resources S. Forests, 266.—Gray, Manual N. States, 5 ed. 459; Hall's Pl. Texas, 21.—Koch, Dendrologie, ii, 644.—Young, Bot. Texas, 512.—Vasey, Cat. Forest Trees, 28.—Burbank in Proc. Boston Soc. Nat. Hist. xviii, 214.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Ridgway in Proc. U. S. Nat. Mus. 1882, 85.

*B. lanulosa*, Michaux, Fl. Bor.-Am. ii, 181.—Nouveau Duhamel, iii, 206.

*B. rubra*, Michaux f. Hist. Arb. Am. ii, 142, t. 3; N. American Sylva, 3 ed. ii, 80, t. 72.—Loddiges, Bot. Cab. t. 1248.—Eaton, Manual, 6 ed. 53.—Eaton & Wright, Bot. 156.—Spach in Ann. Sci. Nat. 2 ser. xv, 185; Hist. Veg. xi, 230.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 19.

*B. angulata*, Loddiges, Cat. ed. 1836.

## RED BIRCH. RIVER BIRCH.

Banks of the Merrimac and Spicket rivers, Middlesex and Essex counties, Massachusetts, Wading river, Long island, south through the coast and middle districts to the Chattahoochee region of western Florida, west to western Iowa, northwestern Missouri, eastern Kansas, the Indian territory, and the valley of the Trinity river, Texas.

A tree 18 to 24 meters in height, with a trunk rarely exceeding 0.75 meter in diameter; banks of streams and ponds; very common and reaching its greatest development in the south Atlantic states and in the basin of the lower Mississippi river.

Wood light, rather hard, strong, close-grained, compact; medullary rays numerous, obscure; color, brown, the sap-wood much lighter; specific gravity, 0.5762; ash, 0.35; used in the manufacture of furniture, woodenware, wooden shoes, ox-yokes, etc.

299.—*Betula lenta*, Linnæus,

Spec. 1 ed. 983.—Lamarek, Dict. i, 453.—Marshall, Arbustum, 19.—Aiton, Hort. Kew. iii, 337; 2 ed. v, 300.—Willdenow, Spec. iv, 464; Enum. 981; Berl. Baumz. 59.—Persoon, Syn. ii, 572.—Desfontaines, Hist. Arb. ii, 477.—Nouveau Duhamel, iii, 205.—Michaux f. Hist. Arb. Am. ii, 147, t. 4; N. American Sylva, 3 ed. ii, 85, t. 74.—Smith in Rees' Cycl. iv, No. 3.—Pursh, Fl. Am. Sept. ii, 621.—Eaton, Manual, 109; 6 ed. 53.—Barton, Compend. Fl. Philadelph. ii, 175.—Nuttall, Genera, ii, 218.—Hayne, Dend. Fl. 167.—Elliott, Sk. ii, 617.—Watson, Dend. Brit. ii, 144.—Sprengel, Syst. ii, 854.—Torrey, Compend. Fl. N. States, 356; Fl. N. York, ii, 200.—Guimpel, Otto & Hayne, Abb. Holz. 105, t. 83.—London, Arboretum, iii, 1713, f. 1566.—Hooker, Fl. Bor.-Am. ii, 156.—Eaton & Wright, Bot. 156.—Bigelow, Fl. Boston. 3 ed. 381.—Lindley in Penn. Cycl. ii, 349.—Spach in Ann. Sci. Nat. 2 ser. xv, 190; Hist. Veg. xi, 241.—Emerson, Trees Massachusetts, 203; 2 ed. i, 232 & t.—Richardson, Arctic Exped. 438.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 20.—Darlington, Fl. Cestricea, 3 ed. 275.—Darby, Bot. S. States, 508.—Cooper in Smithsonian Rep. 1858, 256.—Chapman, Fl. S. States, 428.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 74.—Regel in Mem. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 125, in part; Bull. Soc. Nat. Moscow, xxxviii, 417, in part; De Candolle, Prodr. xvi<sup>2</sup>, 179, in part.—Wood. Cl. Book, 648; Bot. & Fl. 308.—Porcher, Resources S. Forests, 265.—Gray, Manual N. States, 5 ed. 458.—Koch, Dendrologie, ii, 639.—Vasey, Cat. Forest Trees, 28.—Sears in Bull. Essex Inst. xiii, 180.—Bell in Geological Rep. Canada, 1879-'80, 55c.—Ridgway in Proc. U. S. Nat. Mus. 1882, 85.

*B. nigra*, Du Roi, Harbk. i, 93.—Wangenheim, Amer. 35, t. 15, f. 34.

*B. excelsa*, Aiton, Hort. Kew. iii, 337; 2 ed. v, 299 [not Pursh].—Willdenow, Spec. iv, 464.—Berl. Baumz. 41, t. 2, f. 2.—Nouveau Duhamel, iii, 203, t. 52.—Persoon, Syn. ii, 572.—Desfontaines, Hist. Arb. ii, 477.—Poiret, Suppl. i, 687.—Smith in Rees' Cycl. iv, No. 10.—Hayne, Dend. Fl. i, 7.—Spach in Ann. Sci. Nat. 2 ser. xv, 188; Hist. Veg. xi, 243.—Endlicher, Genera, iv<sup>2</sup>, 20.

*B. carpinifolia*, Ehrhart, Beitr. vi, 99.—Willdenow, Enum. 981; Berl. Baumz. 49.

## CHERRY BIRCH. BLACK BIRCH. SWEET BIRCH. MAHOGANY BIRCH.

Newfoundland and the valley of the Saguenay river, west through Ontario to the Manitou islands of lake Huron, south to northern Delaware and southern Indiana, and along the Alleghany mountains to the Chattahoochee region of northern Florida, extending west to middle Kentucky and Tennessee.

A tree 18 to 24 meters in height, with a trunk 0.90 to 1.50 meter in diameter; rich woodlands; very common in all northern forests.

Wood heavy, very strong and hard, close-grained, compact, satiny, susceptible of a beautiful polish; medullary rays numerous, obscure; color, dark brown tinged with red, the sap-wood light brown or yellow; specific gravity, 0.7617; ash, 0.26; now largely used in the manufacture of furniture and for fuel; in Nova Scotia and New Brunswick largely in ship-building.

"Birch beer" is obtained by fermenting the saccharine sap of this and perhaps some other species of the genus

300.—*Alnus maritima*, Muhlenberg,

Mss.—Nuttall, Sylva, i, 34, t. 10<sup>2</sup>; 2 ed. i, 50, t. 10<sup>2</sup>.—Gray, Manual N. States, 5 ed. 461; Hall's Pl. Texas, 21.—Canby in Coulter's Bot. Gazette, vi, 1881.

*Betula-Alnus maritima*, Marshall, Arbustum, 20.

*A. oblongata*, Regel in Mem. Soc. Nat. Moscow, xix, 172, t. vi, f. 3-9 [not Willdenow].

*A. maritima typica*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 427; De Candolle, Prodr. xvi<sup>2</sup>, 186.

## SEASIDE ALDER.

Southern Delaware and eastern Maryland, near the coast; valley of the Red river, Indian territory, in about longitude 96° 30' W. (*E. Hall*); Manchuria and Japan (*A. maritima*, *Japonica* and *arguta*, *Regel* in *De Candolle*, *Prodr.* xvi<sup>2</sup>, 186).

A small tree, 6 to 7 meters in height, with a trunk 0.10 to 0.15 meter in diameter; borders of streams and swamps.

Wood light, soft, close-grained, checking badly in drying; medullary rays broad, conspicuous; color, light bright brown, the sap-wood hardly distinguishable, somewhat lighter; specific gravity, 0.4996; ash, 0.39.

301.—*Alnus rubra*, Bongard,

Mem. Acad. St. Petersburg, 6 ser. ii, 162.—Hooker, Fl. Bor.-Am. ii, 158.—Spach in Ann. Sci. Nat. 2 ser. xv, 205.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 21.—Lyll in Jour. Linnæan Soc. vii, 134.—Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 429; De Candolle, Prodr. xvi<sup>2</sup>, 186.—Torrey, Bot. Wilkes Exped. 467.—Watson, Bot. California, ii, 80.—G. M. Dawson in Canadian Nat. new ser. ix, 331.

?*A. glutinosa*, Pursh, Fl. Am. Sept. ii, 622 [not Willdenow].

*A. Oregona*, Nuttall, Sylva, i, 28, t. 9; 2 ed. i, 44, t. 9.—Newberry in Pacific R. R. Rep. vi, 25, 89.—Cooper in Smithsonian Rep. 1858, 261; Pacific R. R. Rep. xii<sup>2</sup>, 28, 68.—Vasey, Cat. Forest Trees, 28.—Hall in Coulter's Bot. Gazette, ii, 91.

*A. incana*, var. *rubra*, Regel in Mem. Soc. Nat. Moscow, xix, 157, t. 17, f. 3-4.

## ALDER.

Sitka, south through the islands and Coast ranges of British Columbia, Washington territory, Oregon, and California to Santa Barbara, extending east through the Blue mountains to northern Montana.

A large tree, 24 to 30 meters in height, with a trunk 0.90 to 1.20 meter in diameter, or in British Columbia and the Blue mountains often reduced to a low shrub; river bottom lands and borders of streams; most common and reaching its greatest development along the large streams of western Washington territory and Oregon.

Wood light, soft, not strong, brittle, very close-grained, compact, easily worked, satiny, susceptible of a beautiful polish; medullary rays distant, broad; color, light brown tinged with red, the sap-wood nearly white; specific gravity, 0.4813; ash, 0.42; largely used in Oregon in the manufacture of furniture.

302.—*Alnus rhombifolia*, Nuttall,

Sylva, i, 33; 2 ed. i, 49.—Torrey, Bot. Wilkes Exped. 467.—Vasey, Cat. Forest Trees, 28.—Watson, Bot. California, ii, 80.

*A. glutinosa*, var. *serrulata*, Regel in Mem. Soc. Nat. Moscow, xix, 164, in part.

*A. serrulata*, var. *rugosa*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 432, in part; De Candolle, Prodr. xvi<sup>2</sup>, 188, in part.

## ALDER.

Valley of the lower Fraser river, British Columbia, south through the Coast ranges to southern California, extending east along the ranges of Washington territory to Clear creek, Idaho (*Watson*), and the valley of the Flathead river, Montana (*Canby & Sargent*).

A small tree, 9 to 15 meters in height, with a trunk sometimes 0.60 to 0.90 meter in diameter, or toward its northern and eastern limits reduced to a shrub; borders of streams; the common alder of the California valleys.

Wood light, soft, not strong, brittle, close-grained, compact; medullary rays numerous, obscure; color, light brown, the sap-wood lighter, often nearly white; specific gravity, 0.4127; ash, 0.31.

303.—*Alnus oblongifolia*, Torrey,

Bot. Mex. Boundary Survey, 204.—Cooper in Smithsonian Rep. 1858, 266.—Watson in Pl. Wheeler, 17; Bot. California, ii, 80.—Rothrock in Wheeler's Rep. vi, 239.—Rusby in Bull. Torrey Bot. Club, ix, 79.

*A. serrulata*, var. *oblongifolia*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 443; De Candolle, Prodr. xvi<sup>2</sup>, 188.

## ALDER.

San Bernardino and Cayumaca mountains, California, through the ranges of southern Arizona and southern New Mexico to the valley of the Rio Grande; southward into Mexico.

A tree 15 to 21 meters in height, with a trunk 0.90 to 1.20 meter in diameter; borders of streams in deep mountain cañons.

Wood light, soft, not strong, brittle, close-grained, compact; medullary rays numerous, very obscure; color, light brown tinged with yellow, the sap-wood nearly white; specific gravity, 0.3981; ash, 0.42.

304.—*Alnus serrulata*, Willdenow,

Spec. iv, 336; Enum. 965; Berl. Baumz. 2 ed. 21.—Nouveau Duhamel, ii, 216.—Persoon, Syn. ii, 550.—Desfontaines, Hist. Arb. ii, 488.—Aiton, Hort. Kew. 2 ed. v, 259.—Michaux f. Hist. Arb. Am. iii, 320, t. 4, f. 1; N. American Sylva, 3 ed. ii, 87, t. 75, f. 1.—Pursh, Fl. Am. Sept. ii, 623.—Barton, Prodr. Fl. Philadelph. 89; Compend. Fl. Philadelph. ii, 158.—Eaton, Manual, 105; 6 ed. 12.—Nuttall, Genera, ii, 206.—Hayne, Dend. Fl. 122.—Elliott, Sk. ii, 567.—Torrey, Compend. Fl. N. States, 350; Fl. N. York, ii, 202, t. 115.—Beck, Bot. 326.—Darlington, Fl. Cestrica, 3 ed. 276.—London, Arboretum, iii, 1688, f. 1544.—Eaton & Wright, Bot. 120.—Bigelow, Fl. Boston. 3 ed. 220.—Spach in Ann. Sci. Nat. 2 ser. xv, 206; Hist. Veg. xi, 251.—Emerson, Trees Massachusetts, 218; 2 ed. i, 248 & t.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 21.—Darby, Bot. S. States, 508.—Chapman, Fl. S. States, 429.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 102.—Lesquereux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 650; Bot. & Fl. 308.—Porcher, Resources S. Forests, 266.—Gray, Manual N. States, 5 ed. 461.—Young, Bot. Texas, 513.—Broadhead in Coulter's Bot. Gazette, iii, 60.

*Betula rugosa*, Du Roi, Harbk. i, 176.—Wangenheim, Amer. 86, t. 29, f. 60.—Ehrhart, Beitr. iii, 21.

?*Betula-Alnus glauca*, Marshall, Arbustum, 20.

*Betula serrulata*, Aiton, Hort. Kew. iii, 338.—Willdenow, Berl. Baumz. 1 ed. 45.—Abbot, Insects Georgia, ii, 183, t. 92.—Michaux, Fl. Bor.-Am. ii, 181.

*A. serrulata*, var. *vulgaris*, Spach in Ann. Sci. Nat. 2 ser. xv, 206.

*A. serrulata*, var. *macrophylla*, Spach in Ann. Sci. Nat. 2 ser. xv, 206.

*A. serrulata*, var. *oblongata*, Spach, Hist. Veg. xi, 251.

*A. serrulata*, var. *latifolia*, Spach, Hist. Veg. xi, 251.

*A. rubra*, Tuckerman in Am. Jour. Sci. 1 ser. xlv, 32.

*A. hybrida*, Reichenbach, Icon. Fl. Germ. xii, t. 630, f. 1292.

*A. glutinosa*, var. *serrulata*, Regel in Mem. Soc. Nat. Moscow, xix, 164, t. 11, f. 6, 8, in part.

*A. glutinosa*, var. *rugosa*, Regel in Mem. Soc. Nat. Moscow, xix, 165, t. 11, f. 9, 10.

*A. serrulata genuina* and *obtusifolia*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 432; De Candolle, Prodr. xvi<sup>2</sup>, 188.

*A. serrulata*, var. *rugosa*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 432, in part; De Candolle, Prodr. xvi<sup>2</sup>, 188, in part.

*A. rugosa*, Koch, Dendrologie, ii, 635.

*A. oblongata*, *undulata*, *rugosa*, *Canadensis*, and *Americana*, Hort.

## BLACK ALDER. SMOOTH ALDER.

Essex county, Massachusetts, west to southern Missouri, south to northern Florida and the valley of the Trinity river, Texas.

A small tree, 6 to 12 meters in height, with a trunk 0.10 to 0.15 meter in diameter, or more often a tall, branching shrub forming dense thickets; borders of streams and swamps, probably reaching its greatest development in southern Arkansas.

Wood light, soft, close-grained, compact; medullary rays numerous, conspicuous; color, light brown, the sapwood lighter; specific gravity, 0.4666; ash, 0.38.

A decoction of the bark and leaves, as well as those of *A. incana*, is a popular remedy against impurity of the blood and in the treatment of diarrhoea and hematuria, etc. (*Nat. Dispensatory*, 2 ed. 135).

305.—*Alnus incana*, Willdenow,

Spec. iv, 335; Enum. 965; Berl. Baumz. 2 ed. 20.—Persoon, Syn. ii, 550.—Aiton, Hort. Kew. 2 ed. v, 259.—Hayne, Dend. Fl. 152.—Eaton, Manual, 6 ed. 12.—London, Arboretum, iii, 1687, f. 1543.—Hooker, Fl. Bor.-Am. ii, 157.—Eaton & Wright, Bot. 120.—Spach in Ann. Sci. Nat. 2 ser. xv, 206; Hist. Veg. xi, 252.—Nuttall, Sylva, i, 30; 2 ed. i, 46.—Tuckerman in Am. Jour. Sci. 1 ser. xlv, 32.—Torrey, Fl. N. York, ii, 202.—Emerson, Trees Massachusetts, 220; 2 ed. i, 251 & t.—Endlicher, Genera, Suppl. iv<sup>2</sup>, 21.—Parry in Owen's Rep. 618.—Cooper in Smithsonian Rep. 1858, 256.—Hooker f. in Trans. Linnæan Soc. xxiii<sup>2</sup>, 301.—Wood, Cl. Book, 649; Bot. & Fl. 308.—Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 433; De Candolle, Prodr. xvi<sup>2</sup>, 188.—Gray, Manual N. States, 5 ed. 461.—Koch, Dendrologie, ii, 636.—Vasey, Cat. Forest Trees, 28.—Macoun in Geological Rep. Canada, 1875-'76, 210.—Bell in Geological Rep. Canada, 1879-'80, 55.

*Betula-Alnus*, var. *β. incana*, Linnæus, Spec. 1 ed. 983.—Du Roi, Harbk. i, 109.

*Betula incana*, Linnæus, Suppl. 417.—Aiton, Hort. Kew. iii, 339.—Willdenow, Berl. Baumz. 1 ed. 45.—Smith in Rees' Cycl. iv, No. 7.

?*Betula-Alnus rubra*, Marshall, Arbustum, 20.

*A. glauca*, Michaux f. Hist. Arb. Am. iii, 322, t. 4, f. 2; N. American Sylva, 3 ed. 89, t. 75, f. 2.—Bigelow, Fl. Boston. 3 ed. 367.

*A. incana*, var. *glauca*, Gray, Manual N. States, 1 ed. 423; 3 ed. 461.

*A. incana*, *Americana*, and *genuina*, Regel in Mem. Soc. Nat. Moscow, xix, 155.

## SPECKLED ALDER. HOARY ALDER. BLACK ALDER.

Newfoundland to the eastern base of the Rocky mountains, south to northern New England, Wisconsin, Minnesota, and eastern Nebraska; in Europe.

A small tree, 6 to 7 meters in height, with a trunk 0.10 to 0.15 meter in diameter, or more often a tall, branching shrub; borders of streams and swamps.

A form with leaves green and glabrous on both sides or slightly pubescent, extending through the mountain ranges of the Pacific region from the Saskatchewan and British Columbia to New Mexico and the southern Sierra Nevadas of California, is—

var. *virescens*, Watson, Bot. California, ii, 81.

*A. incana*, var. *glauca*, Regel in Mem. Soc. Nat. Moscow, xix, 154, in part; Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup> 433, in part; De Candolle, Prodr. xvi<sup>2</sup>, 189, in part.—Watson in King's Rep. v, 326 [not Aiton]; Pl. Wheeler, 17.—Rothrock, Pl. Wheeler, 50; Wheeler's Rep. vi, 239.—Macoun in Geological Rep. Canada, 1875-'76, 210.

*A. serrulata*, var. *rugosa*, Regel in Bull. Soc. Nat. Moscow, xxxviii<sup>4</sup>, 432, in part; De Candolle, Prodr. xvi<sup>2</sup>, 188, in part.

Wood light, soft, close-grained, checking in drying; medullary rays numerous, broad; color, light brown, the sap-wood nearly white; specific gravity, 0.4607; ash, 0.42; preferred and largely used in northern New England in the final baking of bricks, and occasionally, as well as that of *A. serrulata*, in the manufacture of gunpowder.

## SALICACEÆ.

306.—*Salix nigra*, Marshall,

Arbustum, 139.—Muhlenberg in Neue Schriften Gesell. Nat. Fr. Berlin, iv, 237, t. 4, f. 5 (Ann. Bot. ii, 65, t. 5, f. 5).—Willdenow, Spec. iv, 657; Enum. 1003; Berl. Baumz. 2 ed. 426.—Persoon, Syn. ii, 599.—Michaux f. Hist. Arb. Am. iii, 324, t. 5, f. 1; N. American Sylva, 3 ed. iii, 64, t. 125, f. 1.—Pursh, Fl. Am. Sept. ii, 614.—Poiret, Suppl. iv, 61.—Eaton, Manual, 118; 6 ed. 320.—Nuttall, Genera, ii, 231; Sylva, i, 79; 2 ed. i, 94.—Hayne, Dend. Fl. 180.—Elliott, Sk. ii, 670.—Sprengel, Syst. i, 100.—Torrey, Compend. Fl. N. States, 370; Fl. N. York, ii, 209.—Forbes, Sal. Woburn. 280.—W. Koch, Comment. 17.—Beck, Bot. 320.—Trautvetter in Mem. Acad. St. Petersburg, iii, 614.—London, Arboretum, iii, 1529, 1604, f. 8.—Hooker, Fl. Bor.-Am. ii, 148.—Barratt, Sal. Am. No. 19.—Eaton & Wright, Bot. 408.—Dietrich, Syn. v, 419.—Seringe, Fl. Jard. ii, 35.—Emerson Trees Massachusetts, 271; 2 ed. i, 307 & t.—Darlington, Fl. Cestrica, 3 ed. 279.—Andersson in Ofv. af. Vet. Akad. Forh. 1858, 114 (Proc. Am. Acad. iv, 53); Kongl. Sven. Akad. Handl. vi, 19, f. 15; De Candolle, Prodr. xvi<sup>2</sup>, 200.—Darby, Bot. S. States, 506.—Cooper in Smithsonian Rep. 1858, 256.—Walpers, Ann. v, 744.—Chapman, Fl. S. States, 430.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 75.—Lesqueroux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 654; Bot. & Fl. 310.—Forcher, Resources S. Forests, 334.—Engelmann in Trans. Am. Phil. Soc. new ser. xii, 209.—Gray, Manual N. States, 5 ed. 460; Hall's Pl. Texas, 21.—Koch, Dendrologie, ii, 513.—Young, Bot. Texas, 514.—Macoun in Geological Rep. Canada, 1875-'76, 210.—Vasey, Cat. Forest Trees, 28.—Bobb in Bot. California, ii, 83.—Sears in Bull. Essex Inst. xiii, 181.—Ridgway in Proc. U. S. Nat. Mus. 1882, 86.—Hemsley, Bot. Am.-Cent. iii, 180

*S. pentandra*, Walter, Fl. Caroliniana, 243.

*S. Caroliniana*, Michaux, Fl. Bor.-Am. ii, 226.—Lamarck, Dict. vi, 662.—Poiret, Suppl. v, 62.

*S. Houstoniana*, Pursh, Fl. Am. Sept. ii, 614.—Poiret, Suppl. v, 68.—Sprengel, Syst. i, 107.—Elliott, Sk. ii, 670.—Trautvetter in Mem. Acad. St. Petersburg, iii, 615.—Forbes, Sal. Woburn. 21, t. 21.—Eaton & Wright, Bot. 409.

*S. falcata*, Pursh, Fl. Am. Sept. ii, 614 [not HBK.].—Poiret, Suppl. v, 70.—Sprengel, Syst. i, 107.—Forbes, Sal. Woburn. 279.—Eaton, Manual, 6 ed. 320.—Hooker, Fl. Bor.-Am. ii, 149.—Barratt, Sal. Am. No. 21.—Dietrich, Syn. v, 420.

? *S. ambigua*, Pursh, Fl. Am. Sept. ii, 617.—Forbes, Sal. Woburn. 282.—Eaton, Manual, 6 ed. 321.—Eaton & Wright, Bot. 409.

*S. ligustrina*, Michaux f. Hist. Arb. Am. iii, 326, t. 5, f. 2; N. American Sylva, 3 ed. iii, 65, t. 125, f. 2.—Poiret, Suppl. v, 61.

*S. Purshiana*, Sprengel, Syst. iii, 608.—Beck, Bot. 320.—Darlington, Fl. Cestrica, 2 ed. 560.

*S. flavo-virens*, Hornemann in Cat. Hort. Hafn. Suppl. ii, 11.

? *S. cordata*, var. *falcata*, Torrey, Compend. Fl. N. States, 370.

*S. nigra*, var. *falcata*, Torrey, Fl. N. York, ii, 209.—Carey in Gray, Manual N. States, 1 ed. 429.—Darlington, Fl. Cestrica, 3 ed. 280.

## BLACK WILLOW.

Southern New Brunswick and the northern shores of lakes Huron and Superior southward through the Atlantic region to bay Biscayne and the Caloosa river, Florida, and the valley of the Guadalupe river, Texas; Pacific region, valleys of the Sacramento river, California, and the Colorado river, Arizona.

A small tree, sometimes 15 to 18 meters in height, with a trunk rarely 0.60 meter in diameter, or in southern Florida reduced to a low shrub; usually along the banks of streams; most common in the basin of the Mississippi river and reaching its greatest development in the rich bottom lands of the Colorado and other rivers of eastern Texas; varying greatly in the size and shape of the leaves (vars. *angustifolia*, *longifolia*, *latifolia*, etc., *Andersson in Kongl. Sven. Akad. Handl.* vi, 20), length and habit of the aments, etc.

The best marked forms are—

var. *marginata*, Andersson in *Kongl. Sven. Akad. Handl.* vi, 22; De Candolle, *Prodr.* xvi<sup>2</sup>, 201.

*S. marginata*, Wimmer in *Schedul. Herb. Vindab.*

var. *longipes*, Andersson in *Kongl. Sven. Akad. Handl.* vi, 22; De Candolle, *Prodr.* xvi<sup>2</sup>, 201.

*S. longipes*, Shuttleworth in *herb. Hooker.*—Andersson in *Ofv. af. Vet. Akad. Forh.* 1855, 114 (*Proc. Am. Acad.* iv, 53).—Walpers, *Ann.* v, 744.

Forms of var. *longipes* more or less pubescent have been characterized by *Andersson in Kongl. Sven. Akad. Handl.* vi, 22; *De Candolle, Prodr.* xvi<sup>2</sup>, 201, as subvars. *venulosa* and *gongylocarpa* [*Shuttleworth*], (*S. longipes*, var. *pubescens*, *Andersson in Proc. Am. Acad.* iv, 53; *S. subvillosa*, *Elliott in herb. Schweinitz ex. Nuttall, Sylva*, i, 79; 2 ed. i, 94, *vide Gray in Proc. Am. Acad.* iv, 53, note).

var. *Wrightii*, Andersson in *Kongl. Sven. Akad. Handl.* vi, 22; De Candolle, *Prodr.* xvi<sup>2</sup>, 201.—Hemsley, *Bot. Am.-Cent.* iii, 180.

*S. Wrightii*, Andersson in *Ofv. af. Vet. Akad. Forh.* 1858, 115 (*Proc. Am. Acad.* iv, 55 —Walpers, *Ann.* v, 745.—Torrey in *Bot. Mex. Boundary Survey*, 204.

var. *Wardii*, Bebb in *Bull. U. S. Nat. Mus. No.* 22, 114.

Wood light, soft, weak, close-grained, checking badly in drying; medullary rays obscure; color, brown, the sap-wood nearly white; specific gravity, 0.4456; ash, 0.70.

The tonic and astringent bark used domestically as a popular febrifuge, and containing, in common with that of all the species of the genus, salicylic acid, a powerful anti-pyretic now successfully used in the treatment of acute cases of gout, rheumatism, typhoid fever, etc. (*Am. Jour. Pharm.* 1875, 303.—*U. S. Dispensatory*, 14 ed. 796, 1748.—*Nat. Dispensatory*, 2 ed. 1248).

NOTE.—The closely allied *Salix occidentalis*, Bosc, of the West Indies is not perhaps specifically distinct from *S. nigra*, with which some of the forms of var. *longipes* from southern Florida seem to connect it.

307.—*Salix amygdaloides*, Andersson,

*Ofv. af. Vet. Akad. Forh.* 1858, 114 (*Proc. Am. Acad.* iv, 53).—Walpers, *Ann.* v, 744.—Bebb in *Wheeler's Rep.* vi, 240.

? *S. melanopsis*, Nuttall, *Sylva*, i, 78, t. 21; 2 ed. i, 93, t. 21.

*S. nigra*, var. *amygdaloides*, Andersson in *Kongl. Sven. Akad. Handl.* vi, 21; De Candolle, *Prodr.* xvi<sup>2</sup>, 201.—Rothrock, *Pl. Wheeler*, 50.—Porter & Coulter, *Fl. Colorado*; Hayden's *Surv. Misc. Pub. No.* 4, 128.

## WILLOW.

Shores of the great lakes (Wayne county, New York, *Hankenson*; Painesville, Ohio, *Beardslee*), westward to the valley of the Saskatchewan, and southward through the Rocky Mountain region to southern New Mexico; banks of the lower Columbia river, Oregon (*Howells*).

A small tree, rarely 9 to 12 meters in height, with a trunk 0.15 to 0.30 meter in diameter; along streams.

Wood light, soft, not strong, close-grained, checking in drying; the heart-wood light brown, sap-wood nearly white; specific gravity, 0.4509; ash, 0.92.

308.—*Salix lævigata*, Bebb,

Am. Nat. viii, 202; Bot. California, ii, 83.

## WILLOW.

California, Sierra county (*Lemmon*) and the valley of the Sacramento river to the southern boundary of the state.

A tree sometimes 15 meters in height, with a trunk 0.30 to 0.60 meter in diameter; borders of streams and bottom lands.

A form with narrower falcate leaves (*Yreka, E. L. Greene*) is—

var. *angustifolia*, Bebb in Bot. California, ii, 84.—Rothrock in Wheeler's Rep. vi, 374.

A form with short, densely-flowered aments is—

var. *congesta*, Bebb in Bot. California, ii, 84.

Wood light, soft, not strong, brittle, close-grained, compact; medullary rays numerous, very thin; color, light brown tinged with red; specific gravity, 0.4872; ash, 0.58.

309.—*Salix lasiandra*, Bentham,

Pl. Hartweg. 336.—Torrey in Pacific R. R. Rep. iv, 138.—Newberry in Pacific R. R. Rep. vi, 89.—Bebb in Bot. California, ii, 84.

*S. Hoffmanniana*, Hooker & Arnott, Bot. Beechey, 159.

*S. speciosa*, Nuttall, Sylva, i, 58, t. 17; 2 ed. i, 74, t. 17 [not Hooker & Arnott].—Newberry in Pacific R. R. Rep. vi, 89.—Cooper in Pacific R. R. Rep. xii<sup>2</sup>, 29.

*S. lucida*, var. *angustifolia*, forma *lasiandra*, Andersson in Ofv. af. Vet. Akad. Forh. 1858, 115 (Proc. Am. Acad. iv, 54).

*S. arguta*, var. *lasiandra*, Andersson in Kongl. Sven. Akad. Handl. vi, 33; De Candolle, Prodr. xvi<sup>2</sup>, 206.

## WILLOW.

British Columbia, shores of lake Kamloop (*Macoun*), southward to the valley of the Sacramento river, California; Rocky mountains, Utah, and through Colorado to New Mexico (var. *Fendleriana*).

A tree 12 to 18 meters in height, with a trunk sometimes 0.60 meter in diameter; banks of streams; very common; varying in the shape of the leaves and character of the aments.

The best marked forms are—

var. *lancifolia*, Bebb in Bot. California, ii, 84.

*S. lancifolia*, Andersson in Kongl. Sven. Akad. Handl. vi, 34, f. 23.—Gray in Proc. Am. Acad. vii, 402.—Hall in Coulter's Bot. Gazette, ii, 91.

*S. lucida*, var. *macrophylla*, Andersson in De Candolle, Prodr. xvi<sup>2</sup>, 205.

The common form of British Columbia and western Washington territory and Oregon.

var. *Fendleriana*, Bebb in Bot. California, ii, 84.

*S. pentandra*, var. *caudata*, Nuttall, Sylva, i, 61, t. 18; 2 ed. i, 77, t. 18.

*S. Fendleriana*, Andersson in Ofv. af. Vet. Akad. Forh. 1858, 115 (Proc. Am. Acad. iv, 54).—Walpers, Ann. v, 745.

*S. arguta*, Andersson in Kongl. Sven. Akad. Handl. vi, 32; De Candolle, Prodr. xvi<sup>2</sup>, 205, in part.

Wood light, soft, not strong, brittle, close-grained, compact; medullary rays numerous, very obscure; color, light brown, the sap-wood lighter or often nearly white; specific gravity, 0.4756; ash, 0.60. Var. *lancifolia*, specific gravity, 0.4547; ash, 0.79. Var. *Fendleriana*, the heart-wood brown, sap-wood light brown; specific gravity, 0.4598; ash, 0.56.

310.—*Salix longifolia*, Muhlenberg,

Neue Schriften Gesell. Nat. Fr. Berlin, iv, 238, t. 6, f. 6 (Ann. Bot. ii, 66, t. 5, f. 6).—Willdenow, Spec. iv, 670.—Persoon, Syn. ii, 600.—Pursh, Fl. Am. Sept. ii, 613.—Nuttall, Genera, ii, 231.—Torrey in Ann. Lyc. N. York, ii, 248; Fl. N. York, ii, 209; Nicollet's Rep. 160; Fremont's Rep. 97; Emory's Rep. 412; Sitgreaves' Rep. 172; Bot. Mex. Boundary Survey, 204.—Barratt, Sal. Am. No. 23.—Beck, Bot. 320.—Eaton, Manual, 6 ed. 319.—Eaton & Wright, Bot. 408.—Hooker, Fl. Bor.-Am. ii, 149.—Dietrich, Syn. v, 420.—Parry in Owen's Rep. 618.—Richardson, Arctic Exped. 439, 440.—Cooper in Smithsonian Rep. 1858, 261.—Andersson in Ofv. af. Vet. Akad. Forh. 1858, 116 (Proc. Am. Acad. iv, 56); Kongl. Sven. Akad. Handl. vi, 54, f. 35; De Candolle, Prodr. xvi<sup>2</sup>, 214.—Walpers, Ann. v, 745.—Lesquereux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 653; Bot. & Fl. 310.—Engelmann in Proc. Am. Phil. Soc. new ser. xii, 209.—Gray, Manual N. States, 5 ed. 465.—Watson in King's Rep. v, 324; Wheeler's Rep. 1872, 493.—Gray in Proc. Am. Acad. vii, 402.—Macoun in Geological Rep. Canada, 1875-'76, 210.—Vasey, Cat. Forest Trees, 29.—Hall in Coulter's Bot. Gazette, ii, 91.—Bebb in Wheeler's Rep. vi, 240; Bot. California, ii, 84.—Ward in Bull. U. S. Nat. Mus. No. 22, 116.

*S. fluviatilis*, Nuttall, Sylva, i, 73; 2 ed. i, 89.

? *S. rubra*, Richardson, Arctic Exped. Appx. 37.

*S. longifolia*, var. *pedicellata*, Andersson in Kongl. Sven. Akad. Handl. vi, 55, f. 35; De Candolle, Prodr. xvi<sup>2</sup>, 214.—Macoun in Geological Rep. Canada, 1875-'76, 210.

## SAND-BAR WILLOW.

Valley of the Connecticut river (Sunderland, Massachusetts, *N. G. Jesup*) and of the Potomac river at Washington (*Ward*); west and northwest through the region of the great lakes to the valley of the Mackenzie river, in latitude 66° N. (*Richardson*), through the Mississippi basin, Texas, the Rocky Mountain region, and the Pacific Coast states.

A small tree, 6 to 9 meters in height, with a trunk rarely exceeding 0.30 meter in diameter; borders of streams and river sand-bars, in low, wet sandy soil, often forming low, dense clumps; rare east of the Alleghany mountains; very common throughout the Mississippi River basin, and reaching its greatest development in the valleys of Oregon and northern California.

Well-marked forms, varying from the type in the form of the leaves, aments, and nature of pubescens, etc., are—

var. *exigua*, Bebb in Bot. California, ii, 85.

*S. exigua*, Nuttall, Sylva, i, 75; 2 ed. i, 90.

*S. longifolia*, var. *angustissima*, Andersson in Ofv. af. Vet. Akad. Forh. 1858, 116 (Proc. Am. Acad. iv, 56).

## Western Texas to California and Oregon.

var. *argyrophylla*, Andersson in Kongl. Sven. Akad. Handl. vi, 55; De Candolle, Prodr. xvi<sup>2</sup>, 214.—Watson in King's Rep. v, 324.—Porter in Hayden's Rep. 1872, 493.—Rothrock, Pl. Wheeler, 50.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 128.—Macoun in Geological Rep. Canada, 1875-'76, 210.—Bebb in Bot. California, ii, 85.

*S. argyrophylla*, Nuttall, Sylva, i, 71, t. 20; 2 ed. i, 87, t. 20.

? *S. brachycarpa*, Nuttall, Sylva, i, 69; 2 ed. i, 85.

*S. longifolia*, var. *opaca*, Andersson in Kongl. Sven. Akad. Handl. vi, 55.

*S. longifolia*, var. *argyrophylla angustissima*, Andersson in Kongl. Sven. Akad. Handl. vi, 55; De Candolle, Prodr. xvi<sup>2</sup>, 214.

*S. longifolia*, var. *argyrophylla opaca*, Andersson in De Candolle, Prodr. xvi<sup>2</sup>, 214.

## Western Texas to Oregon.

Wood light, soft, very close-grained, compact; medullary rays numerous, very obscure; color, brown tinged with red, the sap-wood brown; specific gravity, 0.4930; ash, 0.48. Var. *exigua*, heavier, the heart- and sap-wood darker colored; specific gravity, 0.5342; ash, 1.06.

311.—*Salix sessilifolia*, Nuttall,

Sylva, i, 68; 2 ed. i, 84.—Andersson in Ofv. af. Vet. Akad. Forh. 1858, 116 (Proc. Am. Acad. iv, 56); Kongl. Sven. Akad. Handl. vi, 55, f. 36; De Candolle, Prodr. xvi<sup>2</sup>, 214.—Walpers, Ann. v, 746.—Bebb in Bot. California, ii, 85.

*S. sessilifolia*, var. *villosa*, Andersson in De Candolle, Prodr. xvi<sup>2</sup>, 215.

## Puget sound southward to northern California, near the coast.

A small tree, 9 to 12 meters in height, with a trunk rarely exceeding 0.30 to 0.45 meter in diameter; borders of streams, in low, wet ground.

A form with narrower entire leaves, of the Sacramento valley and the California Coast ranges, is—

var. *Hindsiana*, Andersson in *Ofv. af. Vet. Akad. Forh.* 1858, 117 (*Proc. Am. Acad.* iv, 56).—Bebb in *Bot. California*, ii, 85.

*S. Hindsiana*, Benthani, *Pl. Hartweg.* 335.—Newberry in *Pacific R. R. Rep.* vi, 89.—Torrey in *Pacific R. R. Rep.* iv, 138.—Andersson in *Kongl. Sven. Akad. Handl.* vi, 56, f. 37; De Candolle, *Prodr.* xvi<sup>2</sup>, 215.—Walpers, *Ann.* v, 746.

*S. Hindsiana*, var. *tenuifolia*, Andersson in *Kongl. Sven. Akad. Handl.* vi, 56; De Candolle, *Prodr.* xvi<sup>2</sup>, 215.

Wood light, soft, close-grained, compact; medullary rays thin; color, light red, the sap-wood nearly white; specific gravity, 0.4397; ash, 0.50.

### 312.—*Salix discolor*, Muhlenberg,

*Neue Schriften Gesell. Nat. Fr. Berlin*, iv, 234, t. 5, f. 1 (*Ann. Bot.* ii, 62, t. 5, f. 1).—Willdenow, *Spec.* iv, 665.—Persoon, *Syn.* ii, 599.—Pursh, *Fl. Am. Sept.* ii, 613.—Poiret, *Suppl.* v, 56.—Nuttall, *Genera*, ii, 231.—Elliott, *Sk.* ii, 669.—Torrey, *Compend. Fl. N. States*, 369; *Fl. N. York*, ii, 206.—Sprengel, *Syst.* i, 104.—Forbes, *Sal. Woburn.* 279.—Eaton, *Manual*, 6 ed. 319.—Smith in *Rees' Cycl.* No. 25.—Darlington, *Fl. Cestrica*, 3 ed. 257.—Eaton & Wright, *Bot.* 408.—Loudon, *Arboretum*, iii, 1530, f. 1317, 1630, f. 147.—Bigelow, *Fl. Boston.* 3 ed. 392.—Hooker, *Fl. Bor.-Am.* ii, 147.—Barratt, *Sal. Am. No. 3.*—Emerson, *Trees Massachusetts*, 258; 2 ed. i, 296 & t.—Dietrich, *Syn.* v, 419.—Richardson, *Arctic Exped.* 312.—Darby, *Bot. S. States*, 506.—Andersson in *Ofv. af. Vet. Akad. Forh.* 1858, 114 (*Proc. Am. Acad.* iv, 63); *Kongl. Sven. Akad. Handl.* vi, 83, f. 49; De Candolle, *Prodr.* xvi<sup>2</sup>, 225.—Walpers, *Ann.* v, 750.—Chapman, *Fl. S. States*, 430.—Gray, *Manual N. States*, 5 ed. 462.—Koch, *Dendrologie*, ii, 570.—Macoun in *Geological Rep. Canada*, 1874-75, 210.—Ridgway in *Proc. U. S. Nat. Mus.* 1882, 86.

*S. sensitiva*, Barratt, *Sal. Am. No. 8.*

### GLAUCOUS WILLOW.

Labrador, west to the valleys of the Peace and Athabasca rivers, southward through the Atlantic region to Delaware and southern Missouri.

A small tree, rarely exceeding 6 meters in height, with a trunk sometimes 0.30 meter in diameter, or more often a tall, straggling shrub 3 to 6 meters in height; along streams and borders of swamps in low, wet soil; varying greatly in the form of leaves, aments, and nature of pubescence.

The best marked forms are—

var. *eriocephala*, Andersson in *Kongl. Sven. Akad. Handl.* vi, 85; De Candolle, *Prodr.* xvi<sup>2</sup>, 225.—Gray, *Manual N. States*, 5 ed. 463.

*S. eriocephala*, Michaux, *Fl. Bor.-Am.* ii, 225.—Lamarek, *Diet.* vi, 661.—Bigelow, *Fl. Boston.* 3 ed. 391.—Eaton, *Manual*, 6 ed. 321.—Eaton & Wright, *Bot.* 409.—Emerson, *Trees Massachusetts*, 1 ed. 259; 2 ed. i, 196 & t.—Carey in *Gray's Manual N. States*, 1 ed. 426.—Andersson in *Ofv. af. Vet. Akad. Forh.* 1858, 117 (*Proc. Am. Acad.* iv, 57).—Walpers, *Ann.* v, 746.

*S. crassa*, Barratt, *Sal. Am. No. 7.*

var. *prinoides*, Andersson in *Kongl. Sven. Akad. Handl.* vi, 86; De Candolle, *Prodr.* xvi<sup>2</sup>, 225.—Emerson, *Trees Massachusetts*, 2 ed. i, 297.

*S. prinoides*, Pursh, *Fl. Am. Sept.* ii, 613.—Nuttall, *Genera*, ii, 231.—Sprengel, *Syst.* i, 102.—Poiret, *Suppl.* iv, 67.—Torrey, *Compend. Fl. N. States*, 366.—Smith in *Rees' Cycl.* No. 28.—Forbes, *Sal. Woburn.* 79, t. 40.—Eaton, *Manual*, 6 ed. 319.—Beck, *Bot.* 319.—Eaton & Wright, *Bot.* 407.—W. Koch, *Comment.* 46.—Loudon, *Arboretum*, iii, 1530, f. 1317, 1612, f. 40.—Hooker, *Fl. Bor.-Am.* ii, 150.—Emerson, *Trees Massachusetts*, 1 ed. 259.—Dietrich, *Syn.* v, 419.

Wood light, soft, close-grained, compact, containing many evenly-distributed, small, open ducts; medullary rays and layers of annual growth not obscure; color, brown streaked with orange, the sap-wood light brown; specific gravity, 0.4261; ash, 0.43.

### 313.—*Salix flavescens*, Nuttall,

*Sylva*, i, 65; 2 ed. i, 81.—Bebb in *Bot. California*, ii, 86, in part.

Rocky mountains of Idaho and Montana southward to the Mogollon range, New Mexico (*E. L. Greene*); on the Cascade mountains, Oregon, and the Sierra Nevada, California.

A small tree, sometimes 6 to 9 meters in height, with a trunk rarely 0.30 meter in diameter; borders of streams, reaching its greatest development in the southern Rocky Mountain region.

Wood light, soft, not strong, close-grained, compact; medullary rays numerous, obscure; color, brown tinged with red, the sap-wood nearly white; specific gravity, 0.4969; ash, 0.61.

Var. *Scouleriana*, Bebb;

Coulter's Bot. Gazette, vii, 129.

*S. brachystachys*, Bentham, Pl. Hartweg. 336.—Andersson in Ofv. af. Vet. Akad. Forh. 1858, 121 (Proc. Am. Acad. iv, 61); Kongl. Sven. Akad. Handl. vi, 82, f. 48; De Candolle, Prodr. xvi<sup>2</sup>, 224.

*S. Scouleriana*, Barratt in Hooker, Fl. Bor.-Am. ii, 145, in part.—Cooper in Pacific R. R. Rep. xii<sup>2</sup>, 29.

*S. brachystachys*, var. *Scouleriana*, Andersson in De Candolle, Prodr. xvi<sup>2</sup>, 224.

*S. flavescens*, Bebb in Bot. California, ii, 86, in part.

## BLACK WILLOW.

Kadiak island, Alaska (*Kellogg*), southward through British Columbia, western Washington territory, and Oregon to Santa Barbara, California.

A small tree, 8 to 9 meters in height, with a trunk rarely 0.60 meter in diameter; uplands, near springs or streams, or often in quite dry soil; common and reaching its greatest development near the shores of Puget sound.

Wood light, hard, strong, tough, close-grained, compact; medullary rays numerous, very obscure; color, light red, the sap-wood brown; specific gravity, 0.5412; ash, 0.39.

314.—*Salix Hookeriana*, Barratt;

Hooker, Fl. Bor.-Am. ii, 145, t. 180.—Nuttall, Sylva, i, 64; 2 ed. i, 80.—Andersson in Ofv. af. Vet. Akad. Forh. 1858, 119 (Proc. Am. Acad. iv, 59); De Candolle, Prodr. xvi<sup>2</sup>, 274.—Walpers, Ann. v, 747.—Macoun in Geological Rep. Canada, 1875-'76, 210.

Grand rapids of the Saskatchewan (*Douglas*); coast of Washington territory and Oregon.

A small tree, 8 to 9 meters in height, with a trunk rarely 0.30 meter in diameter, or more often a low, straggling shrub with many prostrate stems; on the coast generally along the edge of sea-beaches, or in low, rather moist, sandy soil.

Wood light, soft, close-grained, compact, containing many minute open ducts; medullary rays thin, very obscure; color, light brown tinged with red, the sap-wood nearly white; specific gravity, 0.5350; ash, 0.32.

315.—*Salix cordata*, var. *vestita*, Andersson,

Kongl. Sven. Akad. Handl. vi, 159; De Candolle, Prodr. xvi<sup>2</sup>, 252.

## DIAMOND WILLOW.

Valley of the Missouri river and its tributaries, Fort Osage, Missouri (*Prince Newwied*), Iowa, Nebraska, and westward to about the one hundred and tenth degree of longitude.

A small tree, rarely 8 meters in height, with a trunk 0.15 to 0.20 meter in diameter, or more often a straggling shrub not exceeding 1.80 to 3 meters in height; low bottom lands, in wet, sandy soil.

Wood light, soft, close-grained, compact, the annual layers of growth clearly defined; medullary rays very obscure; color, brown or often tinged red, the sap-wood nearly white; specific gravity, 0.6069; ash, 0.59; heavier than that of other species examined, and largely used for fence posts, being said to equal, when thoroughly seasoned, red cedar in durability in contact with the soil.

NOTE.—The typical *Salix cordata*, Muhlenberg, of wide distribution through the Atlantic region, rarely, if ever, attains arborescent size or habit.

316.—*Salix lasiolepis*, Bentham,

Pl. Hartweg. 335.—Cooper in Smithsonian Rep. 1858, 261.—Andersson in Ofv. af. Vet. Akad. Forh. 1858, 118 (Proc. Am. Acad. iv, 58); De Candolle, Prodr. xvi<sup>2</sup>, 264.—Walpers, Ann. v, 747.—Vasey, Cat. Forest Trees, 29.—Bebb in Bot. California, ii, 86.

*S. lasiolepis*, var. *Bigelovii*, Bebb in Bot. California, ii, 86 (a vernal state, *teste* Bebb *in lit.*).

*S. Bigelovii*, Torrey in Pacific R. R. Rep. iv, 139.—Andersson in Ofv. af. Vet. Akad. Forh. 1858, 118 (Proc. Am. Acad. iv, 58); Kongl. Sven. Akad. Handl. vi, 163, f. 94; De Candolle, Prodr. xvi<sup>2</sup>, 255.—Walpers, Ann. v, 747.

*S. Bigelovii*, var. *fuscior*, Andersson in Kongl. Sven. Akad. Handl. vi, 163; De Candolle, Prodr. xvi<sup>2</sup>, 255.

*S.* ———, ? Watson in King's Rep. v, 325.

*S. lasiolepis*, var. *fallax*, Bebb in Bot. California, ii, 86.

## WILLOW.

California, valley of the Klamath river, southward through the western portions of the state, reaching in the Sierra Nevada an elevation of 3,500 to 4,000 feet above the sea.

A small tree, sometimes 12 to 18 meters in height, with a trunk 0.45 to 0.50 meter in diameter, or northward and at high elevations reduced to a low shrub; leaves varying greatly in shape and breadth (vars. *angustifolia* and *latifolia*, Andersson in *De Candolle Prodr.* xvi<sup>2</sup>, 255), or toward its southern limit often persistent until spring (*S. Hartwegi*, Bentham in *Pl. Hartweg*, 52; *S. humilis*, var. *Hartwegi*, Andersson, l. c. 236).

Wood light, soft, not strong, close-grained, compact; medullary rays numerous, thin; color, light brown, the sap-wood nearly white; specific gravity, 0.5587; ash, 0.98; somewhat used as fuel, especially in the southern part of the state.

317.—*Salix Sitchensis*, Sanson;

Bongard in *Mem. Acad. St. Petersburg*, 6 ser. ii, 162.—Ledebour, *Fl. Rossica*, iii, 609.—Richardson, *Arctic Exped.* 439.—Andersson in *Ofv. af. Vet. Akad. Forh.* 1858, 126 (*Proc. Am. Acad.* iv, 66); *Kongl. Sven. Akad. Handl.* vi, 106, f. 59; *De Candolle, Prodr.* xvi<sup>2</sup>, 233.—Walpers, *Ann.* v, 752.—Gray in *Proc. Am. Acad.* vii, 402.—Hall in *Coulter's Bot. Gazette*, ii, 93.—Bebb in *Bot. California*, ii, 87; *Coulter's Bot. Gazette*, vii, 25.

*S. cuneata*, Nuttall, *Sylva*, i, 66; 2 ed. i, 82.

## SILKY WILLOW.

Alaska, southward near the coast to Santa Barbara, California.

A low, much-branched tree, rarely exceeding 8 meters in height, with a trunk 0.30 to 0.45 meter in diameter, or more often a straggling shrub; low, wet soil, borders of streams and ponds.

A form with narrow oblanceolate leaves is—

var. *angustifolia*, Bebb in *Bot. California*, ii, 87.

*S. chlorophylla*, var. *pellita*, Andersson in *Kongl. Sven. Akad. Handl.* 139, f. 72; *De Candolle, Prodr.* xvi<sup>2</sup>, 244.

Wood light, soft, close-grained, compact; medullary rays numerous, thin; color, light red, the sap-wood nearly white; specific gravity, 0.5072; ash, 0.59.

318.—*Populus tremuloides*, Michaux,

*Fl. Bor.-Am.* ii, 243.—*Nouveau Duhamel*, ii, 184, t. 53.—Persoon, *Syn.* ii, 623.—Desfontaines, *Hist. Arb.* ii, 465.—Michaux f. *Hist. Arb.-Am.* iii, 285, t. 8, f. 1; *N. American Sylva*, 3 ed. ii, 175, t. 99, f. 1.—Poirot, *Suppl.* iv, 377.—Willdenow, *Enum. Suppl.* 67.—Torrey, *Ann. Lyc. N. York*, ii, 249; *Compend. Fl. N. States*, 375; *Fremont's Rep.* 97; *Fl. N. York*, ii, 214; *Sitgreaves' Rep.* 172; *Ives' Rep.* 27; *Bot. Wilkes Exped.* 468.—Beck, *Bot.* 323.—Darlington, *Fl. Cestrica*, 3 ed. 281.—Eaton, *Manual*, 117; 6 ed. 277.—Lindley, *Fl. Mod.* 320.—Hooker, *Fl. Bor.-Am.* ii, 154.—Eaton & Wright, *Bot.* 370.—Bigelow, *Fl. Boston.* 3 ed. 397.—Spach in *Ann. Sci. Nat.* 2 ser. xv, 30; *Hist. Veg.* x, 384.—Nuttall, *Sylva*, i, 55; 2 ed. i, 70.—Seringe, *Fl. des Jard.* ii, 56.—Parry in *Owen's Rep.* 618.—Newberry in *Pacific R. R. Rep.* vi, 25, 89.—Cooper in *Smithsonian Rep.* 1858, 257; *Pacific R. R. Rep.* xii<sup>2</sup>, 29, 68; *Am. Nat.* iii, 409.—Hooker f. in *Trans. Linnean Soc.* xxiii<sup>2</sup>, 301.—Wood, *Cl. Book*, 655; *Bot. & Fl.* 311.—Engelmann in *Trans. Am. Phil. Soc. new ser.* xii, 209.—Gray, *Manual N. States*, 5 ed. 466.—Wesmæl in *De Candolle, Prodr.* xvi<sup>2</sup>, 325.—*London Gard. Chronicle*, 1871, 683.—Watson in *King's Rep.* v, 327; *Pl. Wheeler*, 17; *Am. Jour. Sci.* 3 ser. xv, 135; *Bot. California*, ii, 91.—Porter in *Hayden's Rep.* 1871, 494.—Porter & Coulter, *Fl. Colorado*; *Hayden's Surv. Misc. Pub. No. 4*, 128.—Hayden in *Warren's Rep. Nebraska & Dakota*, 2 ed. 121.—Vasey, *Cat. Forest Trees*, 29.—Hall in *Coulter's Bot. Gazette*, ii, 91.—Macoun in *Geological Rep. Canada*, 1875-76, 210.—Rothrock in *Wheeler's Rep.* vi, 51.—Beal in *Am. Nat.* xv, 32, f. 1.—Trelease in *Coulter's Bot. Gazette*, vi, 284, f. 6.—Scars in *Bull. Essex Inst.* xiii, 183.—G. M. Dawson in *Canadian Nat. new ser.* ix, 231.—Ridgway in *Proc. U. S. Nat. Mus.* 1882, 87.

*P. trepida*, Willdenow, *Spec.* iv, 803.—Aiton, *Hort. Kew.* 2 ed. 395.—Pursh, *Fl. Am. Sept.* ii, 618.—Eaton, *Manual*, 117.—Nuttall, *Genera*, ii, 239.—Sprengel, *Syst.* ii, 244.—London, *Arboretum*, iii, 1649, f. 1510.

*P. tremuliformis*, Emerson, *Trees Massachusetts*, 243; 2 ed. i, 279 & t.

*P. Atheniensis*, Hort.—Koch, *Dendrologie*, ii, 486 (excl. syn.).

## ASPEN. QUAKING ASP.

Northern Newfoundland and Labrador to the southern shores of Hudson bay, northwest to the Great Bear lake, the mouth of the Mackenzie river, and the valley of the Yukon river, Alaska; south in the Atlantic region to the mountains of Pennsylvania, the valley of the lower Wabash river, and northern Kentucky; in the Pacific region south to the valley of the Sacramento river, California, and along the Rocky mountains and interior ranges to southern New Mexico, Arizona, and central Nevada.

A small tree, 15 to 18 meters in height, with a trunk rarely exceeding 0.60 meter in diameter; very common through British America and spreading over enormous areas bared by fire of the coniferous forest; in the Pacific region very common upon moist mountain slopes and bottoms at an elevation of 6,000 to 10,000 feet; the most widely-distributed North American tree.

Wood light, soft, not strong, close-grained, compact, not durable, containing, as does that of the whole genus, numerous minute, scattered, open ducts; medullary rays very thin, hardly distinguishable; color, light brown, the thick sap-wood nearly white; specific gravity, 0.4032; ash, 0.55; largely manufactured into wood-pulp, a substitute for rags in the manufacture of paper; in the Pacific region sometimes used for fuel, flooring, in turnery, etc.

A bitter principle in the bark causes its occasional use as a tonic in the treatment of intermittent fevers and cases of debility (*U. S. Dispensatory*, 14 ed. 1763).

### 319.—*Populus grandidentata*, Michaux,

*Fl. Bor.-Am.* ii, 243.—Persoon, *Syn.* ii, 624.—Desfontaines, *Hist. Arb.* ii, 466.—Michaux f. *Hist. Arb. Am.* iii, 287, t. 8, f. 2; *N. American Sylva*, 3 ed. ii, 176, t. 99, f. 2.—Pursh, *Fl. Am.* Sept. ii, 619.—Poiret, *Suppl.* iv, 377.—Barton, *Compend. Fl. Philadelph.* ii, 197.—Nuttall, *Genera*, ii, 239.—Hayne, *Dend. Fl.* 200.—Willdenow, *Enum. Suppl.* 67.—Elliott, *Sk.* ii, 710.—Sprengel, *Syst.* ii, 244.—Torrey, *Compend. Fl. N. States*, 375; *Fl. N. York*, ii, 214.—Beck, *Bot.* 323.—Eaton, *Manual*, 6 ed. 277.—Hooker, *Fl. Bor.-Am.* ii, 154.—Eaton & Wright, *Bot.* 370.—London, *Arboretum*, iii, 1650, f. 1511.—Bigelow, *Fl. Boston*, 3 ed. 397.—Spach in *Ann. Sci. Nat.* xv, 2 ser. 33; *Hist. Veg.* x, 384.—Emerson, *Trees Massachusetts*, 242; 2 ed. i, 273 & t.—Serenge in *Fl. des Jard.* ii, 56.—Parry in Owen's *Rep.* 618.—Darlington, *Fl. Cestrica*, 3 ed. 281.—Darby, *Bot. S. States*, 507.—Cooper in *Smithsonian Rep.* 1858, 257.—Chapman, *Fl. S. States*, 431.—Curtis in *Rep. Geological Surv. N. Carolina*, 1860, iii, 73.—Wood, *Cl. Book*, 656; *Bot. & Fl.* 311.—Gray, *Manual N. States*, 5 ed. 466.—Koch, *Dendrologie*, ii, 487.—Wesmæl in De Candolle, *Prodr.* xvi<sup>2</sup>, 327.—Vasey, *Cat. Forest Trees*, 29.—Watson in *Am. Jour. Sci.* 3 ser. xv, 135.—Beal in *Am. Nat.* xv, 34, f. 2.—Sears in *Bull. Essex Inst.* xiii, 182.—Trelease in *Coulter's Bot. Gazette*, vi, 285.—Bell in *Geological Rep. Canada*, 1879-'80, 56c.

*P. grandidentata*, var. *pendula*, Torrey, *Compend. Fl. N. States*, 375.—Nuttall, *Genera*, ii, 239.

#### POPLAR.

Nova Scotia, New Brunswick, and west through Ontario to northern Minnesota, south through the northern states and along the Alleghany mountains to North Carolina, extending west to middle Kentucky and Tennessee.

A tree 21 to 24 meters in height, with a trunk 0.50 to 0.75 meter in diameter; rich woods and borders of streams and swamps.

Wood light, soft, not strong, close-grained, compact; medullary rays thin, obscure; color, light brown, the sap-wood nearly white; specific gravity, 0.4632; ash, 0.45; largely manufactured into wood-pulp and occasionally used in turnery, for woodenware, etc.

### 320.—*Populus heterophylla*, Linnæus,

*Spec.* 1 ed. 1034.—Marshall, *Arbustum*, 107.—Wangenheim, *Amer.* 85.—Walter, *Fl. Caroliniana*, 248.—Aiton, *Hort. Kew.* iii, 407; 2 ed. v, 397.—Nouveau Duhamel, ii, 181, t. 51.—Michaux, *Fl. Bor.-Am.* ii, 244.—Willdenow, *Spec.* iv, 806; *Enum.* 1017; *Berl. Baumz.* 293.—Desfontaines, *Hist. Arb.* ii, 466.—Pursh, *Fl. Am.* Sept. ii, 619.—Nuttall, *Genera*, ii, 239.—Hayne, *Dend. Fl.* 203.—Elliott, *Sk.* ii, 712.—Sprengel, *Syst.* ii, 244.—Torrey, *Compend. Fl. N. States*, 375; *Fl. N. York*, ii, 215.—Beck, *Bot.* 323.—Eaton, *Manual*, 6 ed. 278.—Darlington, *Fl. Cestrica*, 3 ed. 281.—London, *Arboretum*, iii, 1672, f. 1534.—Eaton & Wright, *Bot.* 371.—Spach in *Ann. Sci. Nat.* 2 ser. xv, 30; *Hist. Veg.* x, 386.—Serenge in *Fl. des Jard.* ii, 61.—Darby, *Bot. S. States*, 507.—Cooper in *Smithsonian Rep.* 1858, 257.—Chapman, *Fl. S. States*, 431.—Curtis in *Rep. Geological Surv. N. Carolina*, 1860, iii, 73.—Wood, *Cl. Book*, 656; *Bot. & Fl.* 311.—Gray, *Manual N. States*, 5 ed. 467.—Koch, *Dendrologie*, ii, 488.—Wesmæl in De Candolle, *Prodr.* xvi<sup>2</sup>, 326.—Vasey, *Cat. Forest Trees*, 29.—Watson in *Am. Jour. Sci.* 3 ser. xv, 135.—Trelease in *Coulter's Bot. Gazette*, vi, 285.—Ridgway in *Proc. U. S. Nat. Mus.* 1881, 86.

*P. cordifolia*, Burgsdorf, *Anleit. Erz. Holzart.* 3 ed. 152.

*P. argentea*, Michaux f. *Hist. Arb. Am.* iii, 390, t. 9; *N. American Sylva*, 3 ed. ii, 170, t. 97.

*P. heterophylla*, var. *argentea*, Wesmæl in De Candolle, *Prodr.* xvi<sup>2</sup>, 376.

#### RIVER COTTONWOOD. SWAMP COTTONWOOD.

Guilford, Connecticut (*W. R. Dudley*), Northport, Long island, south, generally near the coast, to southern Georgia, through the Gulf states to western Louisiana, and through Arkansas to central Tennessee and Kentucky, southern Illinois and Indiana.

A tree 24 to 27 meters in height, with a trunk 0.60 to 0.75 meter in diameter; borders of river swamps; most common and reaching its greatest development in the basin of the lower Ohio river; rare and local.

Wood light, soft, not strong, close-grained, compact; medullary rays thin, very obscure; color, dull brown, the thick sap-wood lighter brown; specific gravity, 0.4089; ash, 0.81.

321.—*Populus balsamifera*, Linnæus,

Spec. 1 ed. 1034.—Du Roi, Harbk. 82.—Marshall, Arbustum, 107.—Wangenheim, Amer. 85, t. 28, f. 59.—Aiton, Hort. Kew. iii, 406; 2 ed. v, 397.—Mœnch, Meth. 338.—B. S. Barton, Coll. i, 16.—Nouveau Duhamel, ii, 179, t. 50.—Michaux, Fl. Bor.-Am. ii, 244.—Willdenow, Spec. iv, 805; Enum. 1017; Berl. Baumz. 290.—Persoon, Syn. ii, 624.—Desfontaines, Hist. Arb. ii, 466.—Michaux f. Hist. Arb. Am. iii, 306, t. 13, f. 1; N. American Sylva, 3 ed. ii, 172, t. 98, f. 1.—Pursh, Fl. Am. Sept. ii, 618.—Eaton, Manual, 117; 6 ed. 278.—Nuttall, Genera, ii, 239; Sylva, i, 55; 2 ed. i, 70.—Hayne, Dend. Fl. 202.—Sprengel, Syst. ii, 244.—Beck, Bot. 322.—Lindley, Fl. Med. 320.—London, Arboretum, iii, 1637, f. 1535, 1536 & t.—Hooker, Fl. Bor.-Am. ii, 153.—Eaton & Wright, Bot. 370.—Hooker & Arnott, Bot. Beechey, 159.—Spach in Ann. Sci. Nat. 2 ser. xv, 33; Hist. Veg. x, 393.—Lindley, Bot. Reg. xxix, Misc. 20.—Seringe in Fl. des Jard. ii, 65.—Torrey, Fl. N. York, ii, 216; Bot. Wilkes Exped. 469.—Cooper in Smithsonian Rep. 1858, 257; Am. Nat. iii, 408.—Hooker f. in Trans. Linnæan Soc. xxiii<sup>2</sup>, 301.—Wood, Cl. Book, 656; Bot. & Fl. 311.—Gray, Manual N. States, 5 ed. 467.—Koch, Dendrologie, ii, 495.—Vasey, Cat. Forest Trees, 29.—Macoun in Geological Rep. Canada, 1875-76, 211.—Watson in Am. Jour. Sci. xv, 135.—Beal in Am. Nat. xv, 34, f. 4.—Trelease in Coulter's Bot. Gazette, vi, 285.—Scars in Bull. Essex Inst. xiii, 181.—Bell in Geological Rep. Canada, 1879-'80, 45<sup>c</sup>.

*P. Tacamahaca*, Miller, Diet.

*P. viminea*, Bon Jard. 1845, 565.

*P. balsamifera*, var. *genuina*, Wesmæl in De Candolle, Prodr. xvi<sup>2</sup>, 329.

## BALSAM. TACAMAHAC. BALM OF GILEAD.

Straits of Belle Isle to Richmond gulf and cape Churchill, Hudson bay, northwest to the shores of the Great Bear lake and the valley of the Yukon river, Alaska, south to northern New England, central Michigan and Minnesota, the Rocky mountains and interior ranges of Montana and Idaho, Washington territory, and British Columbia.

A large tree, 18 to 24 meters in height, with a trunk 1.50 to 2.10 meters in diameter; very common on all islands and shores of the northern rivers; in British Columbia generally confounded with the allied *P. trichocarpa*, the range of the two species here still uncertain.

Wood very light, soft, not strong, close-grained, compact; medullary rays numerous, very obscure; color, brown, the thick sap-wood nearly white; specific gravity, 0.3635; ash, 0.66.

The buds, as well as those of several other species, covered with a resinous exudation, and occasionally used medicinally as a substitute for turpentine and other balsams.

Var. *candicans*, Gray,

Manual N. States, 2 ed. 419; 5 ed. 467.—Cooper in Smithsonian Rep. 1858, 257.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 129.—Watson in Am. Jour. Sci. 3 ser. xv, 135.—Bull. Torrey Bot. Club, vii, 57.—Trelease in Coulter's Bot. Gazette, vi, 285.

*P. balsamifera lanceolata*, Marshall, Arbustum, 108.

*P. candicans*, Aiton, Hort. Kew. iii, 406; 2 ed. v, 397.—Nouveau Duhamel, ii, 179.—Willdenow, Spec. iv, 806; Enum. 1017; Berl. Baumz. 291.—Persoon, Syn. ii, 624.—Michaux f. Hist. Arb. Am. iii, 306, t. 13, f. 2; N. American Sylva, 3 ed. ii, 173, t. 98, f. 2.—Pursh, Fl. Am. Sept. ii, 618.—Barton, Prodr. Fl. Philadelph. 96.—Poirot, Suppl. iv, 378.—Nuttall, Genera, ii, 239.—Hayne, Dend. Fl. 202.—Sprengel, Syst. ii, 244.—Torrey, Compend. Fl. N. States, 375; Fl. N. York, ii, 217.—Audubon, Birds, t. 59.—Beck, Bot. 322.—Eaton, Manual, 6 ed. 278.—London, Arboretum, ii, 1676, f. 1537.—Hooker, Fl. Bor.-Am. ii, 154.—Eaton & Wright, Bot. 370.—Bigelow, Fl. Boston. 3 ed. 398.—Spach in Ann. Sci. Nat. 2 ser. xv, 33; Hist. Veg. x, 392.—Lindley, Bot. Reg. xxix, Misc. 22.—Emerson, Trees Massachusetts, 245; 2 ed. i, 281.—Seringe in Fl. des Jard. ii, 63.—Gray, Manual N. States, 1 ed. 431.—Wood, Cl. Book, 656; Bot. & Fl. 311.—Wesmæl in De Candolle, Prodr. xvi<sup>2</sup>, 330.

*P. Canadensis*, Mœnch, Weiss. 81 [not Michaux f.].

*P. latifolia*, Mœnch, Meth. 338.

*P. Ontariensis*, Hort.—Loddiges, Cat. 1836.

*P. macrophylla*, Lindley in London, Eneyc. Pl. 840.

*P. aeladescia* and *P. heterophylla*, Hort. (ex. Koch, Wachen. 1865, 238).

A large tree, rare or unknown in a wild state; very common in cultivation.

The wood heavier than that of the species; specific gravity, 0.4161; ash, 0.46.

322.—*Populus angustifolia*, James,

Long's Exped. i, 497.—Torrey in Ann. Lye. N. York, ii, 249; Fremont's Rep. 97; Sitgreaves' Rep. 172; Ives' Rep. 27; Bot. Wilkes Exped. 469.—Nuttall, Sylva, i, 52, t. 16; 2 ed. i, 68, t. 16.—Cooper in Smithsonian Rep. 1858, 261; Am. Nat. iii, 408.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 121.—Vasey, Cat. Forest Trees, 29.—Watson in Am. Jour. Sci. 3 ser. xv, 136; Bot. California, ii, 91.

*P. Canadensis*, var. *angustifolia*, Wesmæl in De Candolle, Prodr. xvi<sup>2</sup>, 329.

*P. balsamifera*, var. *angustifolia*, Watson in King's Rep. v, 327; Pl. Wheeler, 17.—Porter in Hayden's Rep. 1871, 494.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 128.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Rusby in Bull. Torrey Bot. Club, ix, 106.

## BLACK COTTONWOOD.

Black hills of Dakota (*R. Douglas*), Swimming Horse creek, and the Snowy Mountain region, Montana, Red Rock creek, southwestern Montana (*Watson*), east Humboldt and Shoshone mountains, Nevada, Rocky mountains of Colorado, and the ranges of southwestern New Mexico and eastern Arizona.

A small tree, 15 to 18 meters in height, with a trunk rarely exceeding 0.60 meter in diameter; borders of streams, between 6,000 and 10,000 feet elevation.

Wood light, soft, weak, close-grained, compact; medullary rays numerous, obscure; color, brown, the sap-wood nearly white; specific gravity, 0.3912; ash, 0.79.

323.—*Populus trichocarpa*, Torrey & Gray;

Hooker, Icon. v, 878.—Walpers, Ann. v, 767.—Cooper in Smithsonian Rep. 1858, 266.—Wesmæl in De Candolle, Prodr. xvi<sup>2</sup>, 330.—Watson in King's Rep. v, 328; Am. Jour. Sci. 3 ser. xv, 136; Bot. California, ii, 91.—Torrey, Bot. Wilkes Exped. 469.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Trelease in Coulter's Bot. Gazette, vi, 285, f. 5.—G. M. Dawson in Canadian Nat. new ser. ix, 331.

*P. balsamifera*, var. Hooker, Fl. Bor.-Am. ii, 154.

*P. angustifolia*, Newberry in Pacific R. R. Rep. vi, 89 [not James].—Cooper in Pacific R. R. Rep. xii<sup>2</sup>, 29, 68.

*P. balsamifera*, Lyall in Jour. Linnæan Soc. vii, 134 [not Linnæus].—Hall in Coulter's Bot. Gazette, ii, 91.

*P. trichocarpa*, var. *cupulata*, Watson in Am. Jour. Sci. 3 ser. xv, 136; Bot. California, ii, 91.

*P. balsamifera*, var. ? *Californica*, Watson in Am. Jour. Sci. 3 ser. xv, 136.

## BLACK COTTONWOOD. BALSAM COTTONWOOD.

Valley of the Fraser river, British Columbia, and probably much farther north, east to the eastern base of the Bitter Root mountains, Montana (*Watson*), south through Washington territory, western Oregon and California to the southern borders of the state.

A large tree, 24 to 60 meters in height, with a trunk 1.20 to 2.10 meters in diameter; banks of streams and bottom lands below 6,000 feet elevation; very common and reaching its greatest development in the valleys of the lower Columbia river and the streams flowing into Puget sound, here the largest deciduous tree of the forest.

Wood very light, soft, not strong, rather close-grained, compact; medullary rays thin, hardly distinguishable; color, light dull brown, the sap-wood lighter, nearly white; specific gravity, 0.3814; ash, 1.27; in Oregon and Washington territory largely manufactured into staves of sugar barrels, woodenware, etc.

324.—*Populus monilifera*, Aiton,

Hort. Kew. iii, 406; 2 ed. v, 396.—Abbot, Insects Georgia, ii, 71.—Nouveau Duhamel, ii, 186.—Willdenow, Spec. iv, 805; Enum. 1017, Berl. Baumz. 292.—Persoon, Syn. ii, 623.—Desfontaines, Hist. Arb. ii, 465.—Michaux f. Hist. Arb. Am. iii, 295, t. 10, f. 2; N. American Sylva, 3 ed. ii, 168, t. 96, f. 2.—Pursh, Fl. Am. Sept. ii, 618.—Nuttall, Genera, ii, 239; Trans. Am. Phil. Soc. 2 ser. v, 167.—Hayne, Dend. Fl. 202.—Sprengel, Syst. ii, 244.—Watson, Dend. Brit. ii, t. 102.—Beck, Bot. 323.—Eaton, Manual, 6 ed. 278.—London, Arboretum, iii, 1657, f. 1517 & t.—Eaton & Wright, Bot. 371.—Spach in Ann. Sci. Nat. 2 ser. xv, 32; Hist. Veg. x, 389.—Torrey in Fremont's Rep. 97; Fl. N. York, ii, 215; Pacific R. R. Rep. v, 365.—Emerson, Trees Massachusetts, 249; 2 ed. i, 287.—Seringe in Fl. des Jard. ii, 63.—Cooper in Smithsonian Rep. 1858, 257.—Gray in Pacific R. R. Rep. xii<sup>2</sup>, 47; Manual N. States, 5 ed. 467.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 72.—Lesquereux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 655.—Engelmann in Trans. Am. Phil. Soc. xii, 209.—Watson in King's Rep. v, 327; Am. Jour. Sci. 3 ser. xv, 136.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 121.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Trelease in Coulter's Bot. Gazette, vi, 285, f. 3, 4.—Ward in Bull. U. S. Nat. Mus. No. 22, 116.—Beal in Am. Nat. xv, 34, f. 3.—Bell in Geological Rep. Canada, 1879-'80, 56e.—Ridgway in Proc. U. S. Nat. Mus. 1882, 87.—Chapman, Fl. S. States, Suppl. 649.

? *P. deltoide*, Marshall, Arbustum, 106.

- P. angulata*, Aiton, Hort. Kew. iii, 406; 2 ed. v, 396.—Nouveau Duhamel, ii, 186.—Desfontaines, Hist. Arb. ii, 466.—Willdenow, Spec. iv, 805; Enum. 1017; Berl. Baumz. 294.—Michaux f. Hist. Arb. Am. iii, 302, t. 12; N. American Sylva, 3 ed. ii, 161, t. 94.—Pursh, Fl. Ann. Sept. ii, 619.—Eaton, Manual, 117; 6 ed. 277.—Nuttall, Genera, ii, 239.—James in Long's Exped. ii, 164.—Torrey in Ann. Lye. N. York, ii, 249.—Elliott, Sk. ii, 711.—Sprengel, Syst. ii, 244.—London, Arboretum, iii, 1670, 1533 & t.—Eaton & Wright, Bot. 370.—Spach in Ann. Sci. Nat. 2 ser. xv, 321; Hist. Veg. x, 391.—Seringe in Fl. des Jard. ii, 64.—Scheele in Roemer, Texas, 446.—Darby, Bot. S. States, 507.—Cooper in Smithsonian Rep. 1858, 257.—Chapman, Fl. S. States, 431.—Lesquereux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 655; Bot. & Fl. 311.—Gray, Manual N. States, 5 ed. 467.—Wesmæl in De Candolle, Prodr. xvi<sup>2</sup>, 328.—Koch, Dendrologie, ii, 494.—Young, Bot. Texas, 514.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 129.—Vasey, Cat. Forest Trees, 29.—Sears in Bull. Essex Inst. xiii, 182.
- P. laevigata*, Aiton, Hort. Kew. iii, 406; 2 ed. v, 395.—Willdenow, Spec. iv, 803.—Pursh, Fl. Am. Sept. ii, 619.—Poiret, Suppl. iv, 378.—Nuttall, Genera, ii, 239; Sylva, i, 54; 2 ed. i, 70.—Sprengel, Syst. ii, 244.—Beck, Bot. 323.—Eaton, Manual, 6 ed. 278.—Loddiges, Cat. ed. 1836.—Eaton & Wright, Bot. 370.—Emerson, Trees Massachusetts, 246; 2 ed. i, 233.
- P. glandulosa*, Moench, Meth. 339.
- P. angulosa*, Michaux, Fl. Bor.-Am. ii, 243.
- P. Canadensis*, Michaux f. Hist. Arb. Am. iii, 302, t. 12; N. American Sylva, 3 ed. ii, 164, t. 95.—Spach in Ann. Sci. Nat. 2 ser. xv, 32; Hist. Veg. x, 390.—Seringe in Fl. des Jard. ii, 65.—Fescali, Forst. Pfl. 122, t. 8, f. 10-14.—Wood, Bot. & Fl. 311.—Wesmæl in De Candolle, Prodr. xvi<sup>2</sup>, 320.—Koch, Dendrologie, ii, 491.
- P. Virginiana*, Du Mont, Cours. Bot. Cult. vi, 400.
- P. Marylandica*, Bose in Nouv. Dict. xi, 409.—Poiret, Suppl. iv, 378.—Sprengel, Syst. ii, 244.
- P. macrophylla*, Loddiges, Cat. ed. 1836.
- P. Lindleyana*, *P. neglecta*, and *P. laevigata*, Hort.

## COTTONWOOD. NECKLACE POPLAR. CAROLINA POPLAR. BIG COTTONWOOD.

Shores of lake Champlain, Vermont, south through western New England to the Chattahoochee region of western Florida, west along the northern shores of lake Ontario to the eastern base of the ranges of the Rocky mountains of Montana, Colorado, and New Mexico.

A large tree, 24 to 51 meters in height, with a trunk 1.20 to 2.40 meters in diameter; low, moist soil; the common cottonwood of Texas and the western plains, bordering all streams flowing east from the Rocky mountains.

Wood very light, soft, not strong, close-grained, compact, liable to warp in drying, difficult to season; medullary rays numerous, obscure; color, dark brown, the thick sap-wood nearly white; specific gravity, 0.3889; ash, 0.96; largely used in the manufacture of paper-pulp, for light packing-cases, fence boards, and fuel.

325.—*Populus Fremontii*, Watson,

Proc. Am. Acad. x, 350; Am. Jour. Sci. 3 ser. xv, 136; Bot. California, ii, 92.

*P. monilifera*, Newberry in Pacific R. R. Rep. vi, 327 [not Aiton].—Watson in King's Rep. v, 327; Pl. Wheeler, 17.—Torrey, Bot. Wilkes Exped. 469.

## COTTONWOOD.

California, valley of the upper Sacramento river, south to San Bernardino county (Colton, Parry), and eastward in Nevada and Utah.

A large tree, 24 to 30 meters in height, with a trunk 1.20 to 1.80 meter in diameter; borders of streams; the common cottonwood of the valleys of central California.

Wood light, soft, not strong, close-grained, compact, liable to warp in drying, difficult to season; medullary rays thin, very obscure; color, light brown, the sap-wood nearly white; specific gravity, 0.4914; ash, 0.77.

Var. *Wislizeni*, Watson,

Am. Jour. Sci. 3 ser. xv, 137; Bot. California, ii, 92; Proc. Am. Acad. xviii, 157.—Rusby in Bull. Torrey Bot. Club, ix, 79.

*P. monilifera*, Torrey in Sitgreaves' Rep. 172; Bot. Mex. Boundary Survey, 204; Ives' Rep. 27 [not Aiton].—Bigelow in Pacific R. R. Rep. iv, 21.

## COTTONWOOD. WHITE COTTONWOOD.

San Diego county, California, through Arizona and New Mexico to western Texas and southern Colorado.

A large tree, 24 to 30 meters in height, with a trunk 1.20 to 1.80 meter in diameter; borders of streams; the prevalent cottonwood of the arid southwestern region, there largely planted as a shade tree and for fuel.

Wood light, soft, not strong, compact; specific gravity, 0.4621; ash, 1.13; furnishing the ordinary domestic fuel of the region.

## CONIFERÆ.

326.—*Libocedrus decurrens*, Torrey,

Smithsonian Contrib., vi, 7, t. 3; Pacific R. R. Rep. iv, 140; Bot. Mex. Boundary Survey, 211; Bot. Wilkes Exped. t. 16.—Benth, Pl. Hartweg. 338.—Lindley in London Gard. Chronicle, 1853, 695.—Newberry in Pacific R. R. Rep. vi, 63.—Cooper in Smithsonian Rep. 1858, 262.—Walpers, Ann. v, 795.—Bolander in Proc. California Acad. iii, 228.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 456.—R. Brown Campst. in Trans. Edinburgh Bot. Soc. ix, 373.—Hoopes, Evergreens, 309, f. 40.—Watson in King's Rep. v, 335; Bot. California, ii, 116.—A. Murray in London Garden, ii, 542.—Gordon, Pinetum, 2<sup>ed</sup>. 402.—Veitch, Manual Conif. 267.

*Thuya Craigana*, Murray in Rep. Oregon Exped. 2, t. 5.

*Thuya gigantea*, Carrière in Rev. Hort. 1854, 224, f. 12-14, in part; Fl. des Serres, ix, 199, f. 3-5, in part; Trait. Conif. 106, in part; 2<sup>ed</sup>. 112, in part.—Gordon, Pinetum, 321, in part; Suppl. 102, in part.—Henkel & Hochstetter, Nadelhölz. 280, in part.

*Heyderia decurrens*, Koch, Dendrologie, ii<sup>2</sup>, 179.

## WHITE CEDAR. BASTARD CEDAR. POST CEDAR. INCENSE CEDAR.

North fork of the Santian river, Oregon, south along the western slopes of the Cascade and Sierra Nevada mountains between 3,000 and 8,500 feet elevation, and through the California Coast ranges to the San Bernardino and Cayumaca mountains.

A large tree, 30 to 45 meters in height, with a trunk 1.20 to 2.10 meters in diameter; slopes and valleys; common.

Wood light, soft, not strong, brittle, close-grained, compact, very durable in contact with the soil; bands of small summer cells thin, dark colored, conspicuous; medullary rays numerous, obscure; the thin sap-wood nearly white; specific gravity, 0.4017; ash, 0.08; largely used for fencing and in the construction of water-flumes, and for interior finish, furniture, laths, shingles, etc.; often injured by a species of dry rot (*Dadalia vorax*, Harkness in *Pacific Rural Press*, Jan. 25, 1879, f. 1, 2), rendering it unfit for lumber.

327.—*Thuya occidentalis*, Linnæus,

Spec. 1<sup>ed</sup>. 1002.—Kalm, Travels, English ed. iii, 170.—Marshall, Arbustum, 152.—Wangenheim, Amer. 7, t. 2, f. 3.—Walter, Fl. Caroliniana, 238.—Aiton, Hort. Kew. iii, 371; 2<sup>ed</sup>. v, 321.—Gærtner, Fruct. ii, 62, t. 91, f. 2.—Michaux, Fl. Bor.-Am. ii, 209.—Willdenow, Spec. iv, 508; Enum. 990; Berl. Baumz. 504.—Nouveau Duhamel, iii, 12, t. 4.—Poiret in Lamarck, Dict. vii, 369; III. iii, 369.—Schkuhr, Handb. iii, 287, t. 309.—Persoon, Syn. ii, 580.—Desfontaines, Hist. Arb. ii, 575.—Titford, Hort. Bot. Am. 98.—Michaux f. Hist. Arb. Am. iii, 29, t. 3; N. American Sylva, 3<sup>ed</sup>. iii, 177, t. 156.—Pursh, Fl. Am. Sept. ii, 647.—Barton, Prodr. Fl. Philadelph. 93.—Eaton, Manual, 111; 6<sup>ed</sup>. 364.—Nuttall, Genera, ii, 224.—Hayne, Dend. Fl. 177.—Elliott, Sk. ii, 641.—Watson, Dend. Brit. ii, 150.—Sprengel, Syst. iii, 888.—Richard, Conif. 43, t. 71, f. 1.—Torrey, Compend. Fl. N. States, 361; Fl. N. York, ii, 234.—Rafinesque, Med. Bot. ii, 268.—Beck, Bot. 338.—Loudon, Arboretum, iv, 2454, f. 2312-2314 & t.—Forbes, Pinetum Woburn. 193.—Hooker, Fl. Bor.-Am. ii, 165.—Eaton & Wright, Bot. 451.—Bigelow, Fl. Boston. 3<sup>ed</sup>. 388.—Spach, Hist. Veg. xi, 339.—Penn. Cycl. xxiv, 409.—Reid in London Gard. Chronicle, 1844, 276.—Emerson, Trees Massachusetts, 96; 2<sup>ed</sup>. i, 112.—Endlicher, Syn. Conif. 51.—Lindley & Gordon in Jour. Hort. Soc. London, v, 206.—Parry in Owen's Rep. 618.—Darlington, Fl. Cestria, 3<sup>ed</sup>. 294.—Knight, Syn. Conif. 16.—Carrière in Rev. Hort. 1854, 224, f. 15; Trait. Conif. 103; 2<sup>ed</sup>. 109.—Darby, Bot. S. States, 516.—Cooper in Smithsonian Rep. 1858, 257.—Gordon, Pinetum, 323; 2<sup>ed</sup>. 403.—Chapman, Fl. S. States, 436.—Wood, Cl. Book, 662; Bot. & Fl. 315.—Porcher, Resources S. Forests, 507.—Henkel & Hochstetter, Nadelhölz. 278.—Nelson, Pinaceæ, 68.—R. Brown Campst. in Trans. Edinburgh Bot. Soc. ix, 363.—Gray, Manual N. States, 5<sup>ed</sup>. 472.—Hoopes, Evergreens, 317.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 458.—Schnizlein, Icon. t. 76, f. 2.—Koch, Dendrologie, ii<sup>2</sup>, 173.—Vasey, Cat. Forest Trees, 36.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Sears in Bull. Essex Inst. xiii, 183.—Veitch, Manual Conif. 261.—Bell in Geological Rep. Canada, 1879-'80, 47c.

*T. odorata*, Marshall, Arbustum, 152.

*T. obtusa*, Manch, Meth. 691.

*Cupressus Arbor-vitæ*, Targione-Tozzetti, Obs. Bot. ii, 51.

*T. Wareana* and *T. Sibirica*, Hort.

## WHITE CEDAR. ARBOR-VITÆ.

New Brunswick to Anticosti island, through the valley of the Saint Lawrence river to the southern shores of James' bay and southeast to the eastern extremity of lake Winnipeg, south through the northern states to central New York, northern Pennsylvania, central Michigan, northern Illinois, central Minnesota, and along the Alleghany mountains to the high peaks of North Carolina.

A tree 12 to 18 meters in height, with a trunk sometimes 1.20 to 1.50 meter in diameter; cold, wet swamps and along the rocky banks of streams; very common at the north, spreading over great areas of swamp; extensively cultivated as a hedge and ornamental plant, and producing innumerable seminal varieties of more or less horticultural value.

Wood very light, soft, not strong, brittle, rather coarse-grained, compact, very durable in contact with the soil; the bands of small summer cells very thin, dark colored; medullary rays numerous, indistinct; color, light brown, turning darker with exposure, the thin sap-wood nearly white; specific gravity, 0.3164; ash, 0.37; largely used for posts, fencing, railway ties, and shingles.

The distilled oil and a tincture of the leaves of *Thuja* have been found useful in the treatment of pulmonary and uterine complaints (*U. S. Dispensatory*, 14 ed. 1775.—*Nat. Dispensatory*, 2 ed. 1428).

328.—*Thuja gigantea*, Nuttall,

Jour. Philadelphia Acad. vii, 52; *Sylva*, iii, 102, t. iii; 2 ed. ii, 162, t. 111.—Loddiges, *Cat. ed.* 1836.—Loudon, *Arboretum*, iv, 2458.—Hooker, *Fl. Bor.-Am.* ii, 165.—Spach, *Hist. Veg.* xi, 342.—Endlicher, *Syn. Conif.* 52.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 206.—Newberry in *Pacific R. R. Rep.* vi, 56, f. 22.—Carrière, *Trait. Conif.* 102; 2 ed. 112, in part.—Cooper in *Smithsonian Rep.* 1858, 262; *Am. Nat.* iii, 413.—Gordon, *Pinetum*, 321, in part; *Suppl.* 102; 2 ed. 181.—Torrey, *Bot. Mex. Boundary Survey*, 211.—Lyll in *Jour. Linnæan Soc.* vii, 133, 144.—Henkel & Hochstetter, *Nadelhölz.* 280, in part.—Nelson, *Pinaceæ*, 67.—Rothrock in *Smithsonian Rep.* 1867, 434.—Parlatore in *De Candolle, Prodr.* xvi<sup>2</sup>, 457.—R. Brown Campst. in *Trans. Edinburgh Bot. Soc.* ix, 367.—Hoopes, *Evergreens*, 315.—London *Gard. Chronicle*, 1871, 683.—Gray in *Proc. Am. Acad.* vii, 402.—Fowler in *London Gard. Chronicle*, 1872, 1527.—Koch, *Dendrologie*, ii<sup>2</sup>, 176.—Vasey, *Cat. Forest Trees*, 36.—E. Hall in *Coulter's Bot. Gazette*, ii, 91.—Watson, *Bot. California*, ii, 115.—G. M. Dawson in *Canadian Nat. new ser.* ix, 324.—T. Howell in *Coulter's Bot. Gazette*, vi, 267.—Veitch, *Manual Conif.* 256.

*T. plicata*, Don, *Hort. Cantab.* 6 ed. 249.—Lambert, *Pinus*, 1 ed. ii, 19; 2 ed. 114, in part.—Nuttall, *Sylva*, iii, 103; 2 ed. ii, 164.—Spach, *Hist. Veg.* xi, 342.—Endlicher, *Syn. Conif.* 51 (excl. syn. *Wareana & odorata*).—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 205.—Knight, *Syn. Conif.* 16.—Carrière, *Trait. Conif.* 102 (excl. syn. *Wareana & odorata*); 2 ed. 106 (excl. syn. *Wareana*).—Cooper in *Smithsonian Rep.* 1858, 262; *Pacific R. R. Rep.* xii<sup>2</sup>, 27.—Henkel & Hochstetter, *Nadelhölz.* 277 (excl. syn. *odorata*).—Nelson, *Pinaceæ*, 68.—Gordon, *Pinetum*, 2 ed. 406.—A. De Candolle, *Prodr.* xvi<sup>2</sup>, 457, in part.—Vasey, *Cat. Forest Trees*, 36.—Veitch, *Manual Conif.* 263.

*T. Menziesii*, Douglas, *Mss.*—Carrière, *Trait. Conif.* 106; 2 ed. 107.—Gordon, *Pinetum*, 323.—Nelson, *Pinaceæ*, 67.—Henkel & Hochstetter, *Nadelhölz.* 281.

*T. Lobbii*, Hort.

*T. occidentalis*, var. *plicata*, Hort.—Hoopes, *Evergreens*, 321.

## RED CEDAR. CANOE CEDAR.

Alaska, south along the Coast ranges and islands of British Columbia, through western Washington territory and Oregon and the Coast ranges of northern California to Mendocino county, extending east along the mountains of Washington territory to the Cœur d'Alêne, Bitter Root, and Salmon River mountains of Idaho and the western slopes of the Rocky mountains of northern Montana (*Canby & Sargent*).

A large tree, 30 to 45 meters in height, with a trunk 0.90 to 3.60 meters in diameter; low, rich woods and swamps, less commonly on dry ridges and slopes below 5,200 feet elevation; common and reaching its greatest development in western Washington territory and Oregon; the large specimens generally hollow.

Wood very light, soft, not strong, brittle, rather coarse-grained, compact, easily worked, very durable in contact with the soil; bands of small summer cells thin, dark colored, distinct; medullary rays numerous, obscure; color, dull brown tinged with red, the thin sap-wood nearly white; specific gravity, 0.3796; ash, 0.17; largely used for interior finish, fencing, shingles, in cabinet-making and cooperage, and exclusively by the Indians of the northwest coast in the manufacture of their canoes.

329.—*Chamæcyparis sphæroidea*, Spach,

*Hist. Veg.* xi, 331.—Endlicher, *Syn. Conif.* 61.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 209.—Knight, *Syn. Conif.* 20.—Carrière, *Trait. Conif.* 133; 2 ed. 122.—Gordon, *Pinetum*, 49; 2 ed. 71.—Henkel & Hochstetter, *Nadelhölz.* 248.—Nelson, *Pinaceæ*, 69.—Parlatore in *De Candolle, Prodr.* xvi<sup>2</sup>, 464.—Ridgway in *Proc. U. S. Nat. Mus.* 1882, 87.

*Oppressus thyoides*, Linnæus, *Spec.* 1 ed. 1003.—Kalm, *Travels, English ed.* ii, 174.—Du Roi, *Harbk.* ii, 198.—Marshall, *Arbustum*, 39.—Wangenheim, *Amer.* 8, t. 2, f. 4.—Aiton, *Hort. Kew.* iii, 372; 2 ed. v, 323.—Bartram, *Travels*, 2 ed. 409.—Michaux, *Fl. Bor.-Am.* ii, 208.—Willdenow, *Spec.* iv, 512; *Enum.* 991; *Berl. Baumz.* 111.—Nouveau Duhamel, iii, 6.—Persoon, *Syn.* ii, 580.—Desfontaines, *Hist. Arb.* ii, 567.—Schkuhr, *Handb.* iii, 286, t. 310.—Michaux f. *Hist. Arb. Am.* iii, 20, t. 2; *N. American Sylva*, 3 ed. iii, 162, t. 152.—Pursh, *Fl. Am. Sept.* ii, 646.—Eaton, *Manual*, 111; 6 ed. 115.—Nuttall, *Genera*, ii, 224.—Hayne, *Dend. Fl.* 178.—Elliott, *Sk.* ii, 644.—Watson, *Dend. Brit.* ii, 156.—Torrey, *Compend. Fl. N. States*, 361; *Fl. N. York*, ii, 233.—Beck, *Bot.* 338.—Loudon, *Arboretum*, iv, 2475, f. 2327.—Forbes, *Pinetum Woburn.* 183, t. 61.—Hooker, *Fl. Bor.-Am.* ii, 165.—Eaton & Wright, *Bot.* 215.—Bigelow, *Fl. Boston.* 3 ed. 387.—Emerson, *Trees Massachusetts*, 98; 2 ed. i, 114.—Richardson, *Arctic Exped.* 442.—Darby, *Bot. S. States*, 516.—Cooper in *Smithsonian Rep.* 1858, 257.—Chapman, *Fl. S. States*, 435.—Curtis in *Rep. Geological Surv. N. Carolina*, 1860, iii, 28.—Wood, *Cl. Book*, 663; *Bot. & Fl.* 315.—Porcher, *Resources S. Forests*, 509.—Gray, *Manual N. States*, 5 ed. 473.—Hoopes, *Evergreens*, 346.—Koch, *Dendrologie*, ii<sup>2</sup>, 162.—Vasey, *Cat. Forest Trees*, 36.—Veitch, *Manual Conif.* 238.

*Thuja sphæroidea*, Sprengel, *Syst.* iii, 889.

*Thuja sphæroidalis*, Richard, *Conif.* 45, t. 8, f. 2.

## WHITE CEDAR.

Southern Maine, south near the coast to northern Florida, and along the Gulf coast to the valley of the Pearl river, Mississippi.

A tree 24 to 27 meters in height, with a trunk 0.60 to 1.20 meter in diameter; in deep, cold swamps; rare in the Gulf states, west of the bay of Mobile.

Wood very light and soft, not strong, close-grained, compact, easily worked, very durable in contact with the soil; bands of small summer cells thin, dark colored, conspicuous; medullary rays numerous, obscure; color, light brown tinged with red, growing darker with exposure, the sap-wood lighter; specific gravity, 0.3322; ash, 0.33; largely used in boat-building, for woodenware, cooperage, shingles, interior finish, telegraph and fence posts, railway ties, etc.

Along the Atlantic coast from New Jersey southward lumber is manufactured from buried trunks of this species dug from peat swamps.

330.—*Chamæcyparis Nutkaensis*, Spach,

Hist. Veg. xi, 333.—Nuttall, Sylva, iii, 105; 2 ed. ii, 165.—Endlicher, Syn. Conif. 62.—Ledebour, Fl. Rossica, iii, 680.—Lindley & Gordon in Jour. Hort. Soc. London, v, 209.—Carrière, Trait. Conif. 134; 2 ed. 127.—Walpers, Ann. v, 796.—Henkel & Hochstetter, Nadelhölz, 250.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 465.—Hall in Coulter's Bot. Gazette, ii, 91.—G. M. Dawson in Canadian Nat. 2 ser. ix, 329.

*Cupressus Nootkatensis*, Lambert, Pinus, 1 ed. ii, 18; 2 ed. ii, No. 60.—London, Arboretum, iv, 2480.

*Cupressus Nutkaensis*, Hooker, Fl. Bor.-Am. ii, 165.—Newberry in Pacific R. R. Rep. vi, 63, f. 28.—Gordon, Pinetum, 66; 2 ed. 94.—Cooper in Smithsonian Rep. 1853, 263.—Nelson, Pinaceæ, 74.—Hoopes, Evergreens, 345.—Lawson, Pinetum Brit. ii, 199, t. 34, f. 1-12.—Koch, Dendrologie, ii<sup>2</sup>, 165.—Vasey, Cat. Forest Trees, 36.—Macoun in Geological Rep. Canada, 1876-'77, 211.—Veitch, Manual Conif. 235.

*Thuja excelsa*, Bongard in Mem. Acad. St. Petersburg, 6 ser. ii, 164.

*Cupressus Americana*, Trautvetter, Imag. Pl. Fl. Rossica, 12, t. 7.

*C. Nutkaensis*, var. *glauca*, Walpers, Ann. v, 769.

*Thuyopsis borealis*, Hort.—Carrière, Trait. Conif. 1 ed. 113.

*Thuyopsis cupressoides*, Carrière, Man. des Pl. iv, 324.

*C. excelsa*, Fischer in herb. Sitka.

*Thuyopsis Tchugatskoy* and *T. Tchugatskoyæ*, Hort.

## YELLOW CYPRESS. SITKA CYPRESS.

Sitka, south along the islands and Coast ranges of British Columbia and the Cascade mountains of Washington territory and Oregon to the valley of the Santian river, Oregon ("Lucky Camp mountain", *Ousich*).

A large tree of great economic value, 30 to 38 meters in height, with a trunk 1.20 to 1.80 meter in diameter, or toward its southern limits and at high elevations much smaller; common along the coast at the sea-level to about latitude 49° 30' N., then less common and only at higher elevations; south of British Columbia hardly below 5,000 feet elevation and very rare and local; the most valuable timber tree of Alaska.

Wood light, hard, not strong, brittle, very close-grained, compact, very durable in contact with the soil, easily worked, satiny, susceptible of a beautiful polish, possessing an agreeable, resinous odor; bands of small summer cells thin, not conspicuous; medullary rays thin, numerous, hardly distinguishable; color, bright, light clear yellow, the thin sap-wood nearly white; specific gravity, 0.4782; ash, 0.34; somewhat used in boat- and ship-building, for furniture, interior finish, etc., probably unsurpassed in beauty as a cabinet wood by that of any North American tree.

331.—*Chamæcyparis Lawsoniana*, Parlatore,

Stud. Organ. Conif. 23, 29, t. 3, f. 22-25; De Candolle, Prodr. xvi<sup>2</sup>, 464.—Gordon, Pinetum, 2 ed. 85.—Watson, Bot. California, ii, 155.—Sargent in London Gard. Chronicle, 1881, 8.

*Cupressus Lawsoniana*, Murray in Edinburgh New Phil. Jour. new ser. i, 292, t. 9.—Bot. Mag. t. 5581.—Nelson, Pinaceæ, 72.—Cooper in Smithsonian Rep. 1853, 263.—Lawson, Pinetum Brit. ii, 191, t. 31, f. 1-13.—Hoopes, Evergreens 342, f. 53.—Henkel & Hochstetter, Nadelhölz. 246.—Fowler in London Gard. Chronicle, 1872, 235.—London Garden, vii 508 & t.—Vasey, Cat. Forest Trees, 36.—Veitch, Manual Conif. 231.—Eichler in Monatsb. Acad. Berl. 1881, f. 29, 30.

*Cupressus fragrans*, Kellogg in Proc. California Acad. i, 103.

? *Cupressus attenuata*, Gordon, Pinetum, 1 ed. 57; 2 ed. 79.

*C. Boissierii*, Carrière, Trait. Conif. 2 ed. 125 [not Decaisne].

*C. Nutkanus*, Torrey, Bot. Wilkes Exped. t. 16.

PORT ORFORD CEDAR. OREGON CEDAR. WHITE CEDAR. LAWSON'S CYPRESS. GINGER PINE.

Oregon, Coos bay, south to the valley of the Rogue river, not extending more than thirty miles from the coast; California, valley of the upper Sacramento river (shores of Castle and Soda lakes, Shasta county).

A large tree of the first economic value, 45 to 61 meters in height, with a trunk 1.80 to 4 meters in diameter; rich woods, in low, moist soil, interspersed with the yellow fir and hemlock; most common and reaching its greatest development along the Oregon coast; local; in California very rare and local.

Wood light, hard, strong, very close-grained, compact, easily worked, very durable in contact with the ground, abounding in odoriferous resin, satiny, susceptible of a beautiful polish; layers of small summer cells thin, not conspicuous; medullary rays numerous, very obscure; color, light yellow or almost white, the thin sap-wood hardly distinguishable; specific gravity, 0.4621; ash, 0.10; largely manufactured into lumber and used for interior finish, flooring, railway ties, fence posts, matches, and in ship- and boat-building; the resin strongly diuretic and a powerful insecticide.

332.—*Cupressus macrocarpa*, Hartweg,

Jour. Hort. Soc. London, ii, 187.—Bentham, Pl. Hartweg, 337.—Gordon in Jour. Hort. Soc. London, iv, 296 & t.; Pinetum, 65; 2 ed. 91.—Lindley & Gordon in Jour. Hort. Soc. London, v, 206.—Knight, Syn. Conif. 20.—Torrey, Bot. Mex. Boundary Survey, 211.—Cooper in Smithsonian Rep. 1858, 263; Proc. California Acad. iii, 290.—Carrière, Trait. Conif. 1 ed. 124, in part.—Bolander in Proc. California Acad. iii, 228.—Henkel & Hochstetter, Nadelhölz. 239.—Nelson, Pinacæ, 73.—Hoopes, Evergreens, 353.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 473.—Fowler in London Gard. Chronicle, 1872, 285.—Koch, Dendrologie, ii<sup>2</sup>, 148.—Vasey, Cat. Forest Trees, 36.—Watson, Bot. California, ii, 113.—Veitch, Manual Conif. 234.—Lawson Pinetum Brit. ii, 195, t. 32.

*C. Lambertiana*, Carrière in Rev. Hort. 1855, 232; Trait. Conif. 124; 2 ed. 166.

*C. Hartwegii*, Carrière in Rev. Hort. 1855, 232; Trait. Conif. 2 ed. 168.

? *C. macrocarpa*, var. *fastigiata*, Knight, Conif. 20.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 473.—Veitch, Manual Conif. 234.

? *C. Hartwegii*, var. *fastigiata*, Carrière, Trait. Conif. 2 ed. 169.

## MONTEREY CYPRESS.

California, Monterey (Cypress point, Pescadero ranch, and Carmelo point).

A tree 15 to 21 meters in height, with a trunk 1.20 to 1.80 meter in diameter; on granite rocks immediately upon the sea-coast; very local.

Wood heavy, hard, strong, rather brittle, very close-grained, compact, easily worked, very durable in contact with the soil, satiny, susceptible of a beautiful polish, odorous; bands of small summer cells thin, dark colored, conspicuous; medullary rays numerous, hardly distinguishable; color, clear bright brown streaked with red and yellow, the thin sap-wood light yellow; specific gravity, 0.6261; ash, 0.57; very beautiful and of undoubted value as a cabinet wood.

333.—*Cupressus Goveniana*, Gordon,

Jour. Hort. Soc. London, iv, 296 & f.; Pinetum, 60; 2 ed. 83.—Bentham, Pl. Hartweg, 337.—Lindley & Gordon in Jour. Hort. Soc. London, v, 206.—Carrière, Trait. Conif. 125; 2 ed. 170.—Torrey, Mex. Boundary Survey, 211.—Cooper in Smithsonian Rep. 1858, 266.—Henkel & Hochstetter, Nadelhölz. 240.—Hoopes, Evergreens, 252.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 472.—Fowler in London Gard. Chronicle, 1872, 285.—Watson, Bot. California, ii, 114.—Veitch, Manual Conif. 230.

? *C. Californica*, Carrière, Trait. Conif. 127; 2 ed. 164.

*C. Californica gracilis*, Nelson, Pinacæ, 70, in part

? *C. cornuta*, Carrière in Rev. Hort. 1866, 251 & f.

? *Juniperus aromatica*, Hort.

Humboldt county, California, south along the coast and through the Coast ranges into Lower California.

A small tree, sometimes 12 to 15 meters in height, with a trunk 0.60 to 0.90 meter in diameter; borders of streams and mountain slopes, in rather rich soil, or often a low shrub, fruiting when 0.30 to 1 meter in height, and occupying extensive tracts of sandy barrens 1 to 5 miles inland from the coast, or thin, rocky soil (*Pringle*); widely but not generally distributed.

Wood light, soft, not strong, brittle, close-grained, compact; bands of small summer cells broad, dark colored, conspicuous; medullary rays thin, obscure; color, light brown, the thick sap-wood nearly white; specific gravity, 0.4689; ash, 0.45.

334.—*Cupressus Macnabiana*, Murray,

Edinburgh, New Phil. Jour. new ser. i, 293, t. 10.—Gordon, Pinetum, 64; 2 ed. 90.—Carrière, Trait. Conif. 2 ed. 165.—Hoopes, Evergreens, 353.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 473.—Koch, Dendrologie, ii<sup>2</sup>, 150.—Vasey, Cat. Forest Trees, 36.—Watson, Bot. California, ii, 114.—Veitch, Manual Conif. 233.

*C. glandulosa*, Hooker, (ex. Henkel & Hochstetter, Nadelhölz. 241).

*C. Californica gracilis*, Nelson, Pinaceæ, 70, in part.

California, mountains south of Clear lake, Lake county (*Torrey, Bolander, Pringle, Miller*).

A small tree, sometimes 9 meters in height, with a trunk 0.30 to 0.45 meter in diameter, or more often a tall shrub branching from the ground; very rare and local; not rediscovered in the original station reported by Jeffrey, the Mount Shasta region.

Wood not collected.

335.—*Cupressus Guadalupensis*, Watson,

Proc. Am. Acad. xiv, 300; Bot. California, ii, 114.

*C. macrocarpa*, ? Watson in Proc. Am. Acad. xi, 119 [not Hartweg].

*C. Arizona*, E. L. Greene in Bull. Torrey Bot. Club, ix, 64.—Rusby in Bull. Torrey Bot. Club, ix, 79.—Watson in Proc. Am. Acad. xviii, 157.

San Francisco mountains of New Mexico and eastern Arizona (*Greene, Rusby*), Santa Catalina and Santa Rita mountains, Arizona (*Pringle, Lemmon*); on the Sierra Madre, near Saltillo, and Gaudalupe island, Mexico (*Palmer*).

A tree 18 to 21 meters in height, with a trunk 0.60 to 0.90 meter in diameter; rocky cañons and ridges; on the New Mexico and Arizona mountains, forming extensive forests between 5,000 and 8,000 feet elevation, generally on northern slopes; local.

Wood light, soft, very close-grained, compact, easily worked, susceptible of a good polish; bands of small summer cells, broad, conspicuous; medullary rays numerous, very obscure; color, gray, often faintly streaked with yellow, the thick sap-wood light yellow; specific gravity, 0.4843; ash, 0.44.

336.—*Juniperus Californica*, Carrière,

Rev. Hort, iii, 353 & f.; Trait. Conif. 58; 2 ed. 41.—Gordon, Pinetum, 121.—Vasey, Cat. Forest Trees, 37.—Engelmann in Trans. St. Louis Acad. iii, 588; Wheeler's Rep. vi, 375.—Palmer in Am. Nat. xii, 593.—Watson, Bot. California, ii, 113.

*J. tetragona*, var. *osteosperma*, Torrey in Pacific R. R. Rep. iv, 141; Bot. Mex. Boundary Survey, 210; Ives' Rep. 28.

*J. tetragona*, Cooper in Smithsonian Rep. 1858, 263 [not Schlechtendal].

*J. Cerrosianus*, Kellogg in Proc. California Acad. ii, 37.

*J. occidentalis*, Gordon, Pinetum, Suppl. 38; Pinetum, 2 ed. 162, in part.—Henkel & Hochstetter, Nadelhölz. 245, in part.—Hoopes, Evergreens, 299, in part.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 489, in part.

*J. Californica*, var. *osteosperma*, Engelmann; Watson in Proc. Am. Acad. xi, 119.

## JUNIPER.

California, San Francisco bay, south through the Coast ranges to Lower California.

A small tree, rarely 6 to 9 meters in height, with a trunk 0.30 to 0.60 meter in diameter, or more often a tall shrub, sending up many stems from the ground; sandy barrens and dry, rocky soil.

Wood light, soft, very close-grained, compact, very durable in contact with the soil; bands of small summer cells thin, dark colored, not conspicuous; medullary rays numerous, very obscure; color, light brown slightly tinged with red, the sap-wood nearly white; specific gravity, 0.6282; ash, 0.75; in southern California largely used for fencing and fuel.

Var. *Utahensis*, Engelmann,

Trans. St. Louis Acad. iii, 588; Wheeler's Rep. vi, 264.—Vasey, Cat. Forest Trees, 37.—Sargent in Am. Jour. Sci. 3 ser. xvii, 418.—Palmer in Am. Nat. xii, 594.—Watson, Bot. California, ii, 113.

*J. occidentalis*, Watson in King's Rep. v, 336, in part; Pl. Wheeler, 18 [not Hooker].

*J. occidentalis*, var. *Utahensis*, Veitch, Manual Conif. 289.

## JUNIPER.

Western base of the Wahsatch mountains, Utah, to eastern California, south through the Great Basin to southeastern California (*Pringle*) and the San Francisco mountains, eastern Arizona (*Greene*).

A small, contorted tree, 6 to 9 meters in height, with a trunk 0.60 to 0.90 meter in diameter, or more often a tall, much-branched shrub; very common through the elevated valleys and along the lower slopes of all the ranges of central and southern Utah and Nevada, and the most generally distributed arborescent species of the region.

Wood light, soft, close-grained, compact, very durable in contact with the soil; color, light brown, the thick sap-wood nearly white; specific gravity, 0.5522; ash, 0.49; the common fuel and fencing material of the region.

337.—*Juniperus pachyphloea*, Torrey,

Pacific R. R. Rep. iv, 142; Bot. Mex. Boundary Survey, 210; Ives' Rep. 28.—Cooper in Smithsonian Rep. 1858, 263.—Henkel & Hochstetter, Nadelhölz. 247.—Carrière, Trait. Conif. 2 ed. 56.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 490.—Gordon, Pinetum, 2 ed. 164.—Engelmann in Trans. St. Louis Acad. iii, 589; Wheeler's Rep. vi, 264.—Palmer in Am. Nat. xii, 593.—Veitch, Manual Conif. 289.—Rusby in Bull. Torrey Bot. Club, ix, 79.—Hemsley, Bot. Am.-Cent. iii, 184.

*J. plochyderma*, Torrey in Sitgreaves' Rep. 173, t. 16.

*J. Sabina pachyphloea*, Antoine, Kupress. 39.

## JUNIPER.

Eagle and Limpia mountains (*Havard*), west along the ranges of western Texas, southern New Mexico and Arizona south of latitude 34°; southward into Mexico.

A tree 9 to 15 meters in height, with a trunk 0.60 to 1.20 meter in diameter; dry, stony slopes and ridges, generally between 2,000 and 3,000 feet elevation; the prevailing and largest juniper of the mountains of western Texas.

Wood light, soft, not strong, brittle, very close-grained, compact, susceptible of a fine polish; bands of small summer cells very thin, dark colored, not conspicuous; medullary rays numerous, obscure; color, clear light red, often streaked with yellow, the thin sap-wood nearly white; specific gravity, 0.5829; ash, 0.11.

338.—*Juniperus occidentalis*, Hooker,

Fl. Bor.-Am. ii, 166.—Endlicher, Syn. Conif. 26.—Lindley & Gordon in Jour. Hort. Soc. London, v, 202.—Carrière, Conif. 42, in part; 2 ed. 40, in part.—Torrey in Pacific R. R. Rep. iv, 142.—Cooper in Smithsonian Rep. 1853, 263.—Gordon, Pinetum, 117 (excl. syn.); Suppl. 38 (excl. syn.); 2 ed. 162 (excl. syn.).—Henkel & Hochstetter, Nadelhölz. 345, in part.—Nelson, Pinaceæ, 142.—Hoopes, Evergreens, 299 (excl. syn. *Californica*).—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 489, in part.—Vasey, Cat. Forest Trees, 37.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Palmer in Am. Nat. xii, 594.—Watson, Bot. California, ii, 113.—Veitch, Manual Conif. 289.

*J. excelsa*, Pursh, Fl. Am. Sept. ii, 647.—Nuttall, Genera, ii, 245.

*J. Andina*, Nuttall, Sylva, iii, 95, t. 110; 2 ed. ii, 157, t. 110.—Carrière, Trait. Conif. 2 ed. 55.

*Chamaecyparis Boursierii*, Decaisne in Bull. Soc. Bot. France, i, 70.

*J. Hermannii*, Koch, Dendrologie, ii<sup>2</sup>, 141 [not Sprengel].

*J. occidentalis*, var. *pleiosperma*, Engelmann in Trans. St. Louis Acad. ii, 590.

*J. pyriformis*, Hort.

## JUNIPER.

Blue mountains and high prairies of eastern Washington territory and Oregon, Cascade mountains of Oregon, valley of the Klamath river, California, and south along the high ridges of the Sierra Nevada, between 7,000 and 10,000 feet elevation, to the San Bernardino mountains (*Parish Bros.*).

A tree 9 to 15 meters in height, with a trunk 1.20 to 2.10 meters in diameter, or often a low, much-branched shrub; dry, rocky ridges and prairies, reaching its greatest development in the California sierras.

Wood light, soft, very close-grained, compact, very durable in contact with the soil; bands of small summer cells thin, not conspicuous; medullary rays numerous, very obscure; color, light red or brown, the sap-wood nearly white; specific gravity, 0.5765; ash, 0.12; largely used for fencing and fuel.

Var. *monosperma*, Engelmann,

Trans. St. Louis Acad. iii, 590; Wheeler's Rep. vi, 263.—Veitch, Manual Conif. 289.—Rusby in Bull. Torrey Bot. Club, ix, 79.

## JUNIPER.

Eastern base of Pike's peak, Colorado, to the mountains of western Texas, and through New Mexico and southern Arizona to southern California.

A small, stunted tree, 6 to 9 meters in height, with a trunk sometimes 0.60 meter in diameter, or often branching from the ground with many stout, contorted stems; dry, gravelly slopes between 3,500 and 7,000 feet elevation.

Wood heavier than that of the type, the layers of annual growth often eccentric; specific gravity, 0.7119; ash, 0.78; largely used for fuel and fencing.

Var. *conjugens*, Engelmann,

Trans. St. Louis Acad. iii, 590.—Veitch, Manual Conif. 289.—Watson in Proc. Am. Acad. xviii, 158.

## JUNIPER.

Western Texas, valley of the Colorado river (Austin), west and north.

A tree 11 to 15 meters in height, with a trunk sometimes 0.30 meter in diameter, covering with extensive forests the limestone hills of western Texas; its range not yet satisfactorily determined.

Wood light, hard, not strong, very close-grained, compact, very durable in contact with the soil; bands of small summer cells thin, dark colored, conspicuous; medullary rays numerous, very obscure; color, brown, often streaked with red, the thin sap-wood nearly white; specific gravity, 0.6907; ash, 0.46; largely used for fencing, fuel, telegraph poles, railway ties, etc.

339.—*Juniperus Virginiana*, Linnæus,

Spec. 1 ed. 1039.—Kalm, Travels, English ed. ii, 180.—Marshall, Arbustum, 70.—Wangenheim, Amor. 9, t. 2, f. 5.—Walter, Fl. Caroliniana, 248.—Aiton, Hort. Kew. iii, 414; 2 ed. v, 414.—Lamarek, Dict. iv, 627.—Willdenow, Spec. iv, 853; Enum. 1025; Berl. Baumz. 198.—Persoon, Syn. ii, 632.—Desfontaines, Hist. Arb. ii, 539.—Michaux f. Hist. Arb. Am. iii, 42, t. 5; N. American Sylva, 3 ed. 173, t. 155.—Pursh, Fl. Am. Sept. 647.—Nouveau Duhamel, vi, 49, t. 16.—Barton, Prodr. Fl. Philadelph. 96; Compend. Fl. Philadelph. ii, 200.—Eaton, Manual, 118; 2 ed. 194.—Nuttall, Genera, ii, 245; Sylva, iii, 97; 2 ed. ii, 159.—Bigelow, Med. Bot. iii, 49, t. 45; Fl. Boston, 3 ed. 398.—Hayne, Dend. Fl. 205.—Elliot, Sk. ii, 717.—Torrey in Nicolle's Rep. 167; Compend. Fl. N. States, 377; Fl. N. York, ii, 235; Marcy's Rep. 284; Pacific R. R. Rep. iv, 142; Bot. Mex. Boundary Survey, 211; Ives' Rep. 28.—Sprengel, Syst. iii, 908.—Richard, Conif. 37, t. 6, f. 2.—Audubon, Birds, t. 43.—Rafinesque, Med. Bot. ii, 13.—Beck, Bot. 337.—Lindley, Fl. Med. 556.—Loudon, Arboretum, iv, 2495, f. 2357.—Forbes, Pinetum Woburn. 199.—Penn. Cycl. xiii, 147.—Eaton & Wright, Bot. 288.—Emerson, Trees Massachusetts, 102; 2 ed. i, 118.—Endlicher, Syn. Conif. 27, in part.—Scheele in Roemer, Texas, Appx. 447.—Lindley & Gordon in Jour. Hort. Soc. London, v, 202.—Parry in Owen's Rep. 618.—Darlington, Fl. Cestrica, 3 ed. 295.—Knight, Syn. Conif. 12.—Darby, Bot. S. States, 515.—Durand in Jour. Philadelphia Acad. 1855, 101.—Torrey & Gray in Pacific R. R. Rep. ii, 130, 175.—Carrière, Trait. Conif. 43; 2 ed. 44.—Bigelow in Pacific R. R. Rep. 20.—Gordon, Pinetum, 112; 2 ed. 154.—Cooper in Smithsonian Rep. 1858, 257; Am. Nat. iii, 413.—Chapman, Fl. S. States, 435.—Gray in Pacific R. R. Rep. xii<sup>3</sup>, 48; Manual N. States, 5 ed. 474; Hall's Pl. Texas, 21.—Hooker f. in Trans. Linnæan Soc. xxiii<sup>3</sup>, 302.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 71.—Lesqueroux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 663; Bot. & Fl. 314.—Porcher, Resources S. Forests, 510.—Engelmann in Trans. Am. Phil. Soc. new ser. xii, 209; Trans. St. Louis Acad. iii, 591; Wheeler's Rep. vi, 263.—Lyll in Jour. Linnæan Soc. vii, 144.—Henkel & Hochstetter, Nadelhölz. 335.—Nelson, Pinaceæ, 153.—Hoopes, Evergreens, 291.—Parlatore in De Candolle, Prodr. xvi<sup>3</sup>, 488.—Young, Bot. Texas, 517.—Koch, Dendrologie, ii<sup>3</sup>, 138.—Watson in King's Rep. v, 335.—Rothrock in Pl. Wheeler, 28, 50; Wheeler's Rep. vi, 10.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 132.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 122.—Vasey, Cat. Forest Trees, 37.—Guibourt, Hist. Drogues, 7 ed. ii, 242.—Broadhead in Coulter's Bot. Gazette, iii, 60.—G. M. Dawson in Canadian Nat. new ser. ix, 329.—Scars in Bull. Essex Inst. xiii, 183.—Veitch, Manual Conif. 282.—Bell in Geological Rep. Canada, 1879-'80, 52<sup>c</sup>.—Ridgway in Proc. U. S. Nat. Mus. 1882, 87.—Hemsley, Bot. Am.-Cent. iii, 184.

*J. Caroliniana*, Marshall, Arbustum, 71.—Du Roi, Harbk. 2 ed. 497.

*J. arborescens*, Mœuch, Meth. 699.

*J. Barbadosensis*, Michaux, Fl. Bor.-Am. ii, 246 [not Linnæus].—Pursh, Fl. Am. Sept. ii, 647.—Nuttall, Genera, ii, 245; Sylva, iii, 96; 2 ed. ii, 158.

*J. Virginiana*, var. *Caroliniana*, Willdenow, Berl. Baumz. 198.—Hayne, Dend. Fl. 205.—Loudon, Arboretum, iv, 2495.

*J. Virginiana*, var. *Hermannii*, Persoon, Syn. ii, 632.

*J. Hermannii*, Sprengel, Syst. iii, 908.

*J. foetida*, var. *Virginiana*, Spach in Ann. Sci. Nat. 2 ser. xvi, 298; Hist. Veg. xi, 315.

*J. Virginiana vulgaris*, Endlicher, Syn. Conif. 28.

*J. Sabina*, var. *Virginiana*, Antoine, Kupress. t. 83, 84.

## RED CEDAR. SAVIN.

Southern New Brunswick to the northern shores of Georgian bay, northern Michigan, Wisconsin and Minnesota, south to cape Malabar and Tampa bay, Florida, and the valley of the Colorado river, Texas, west to eastern Nebraska, Kansas, and the Indian territory to about the one hundredth parallel of west longitude; in the Pacific region, Rocky mountains of Colorado to Vancouver's island, British Columbia; not extending to western Texas, California, or Oregon; in Utah, Nevada, and Arizona rare and local.

The most widely distributed of North American Coniferae, a tree 24 to 30 meters in height, with a trunk 0.60 to 1.35 meter in diameter, or toward its northern and western limits much smaller, often reduced to a low shrub; dry, gravelly ridges, and limestone hills, or in the Gulf states, especially near the coast, in deep swamps; in northern Montana, borders of streams and lakes; common; and reaching its greatest development in the valley of the Red river, Texas.

Wood light, soft, not strong, brittle, very close and straight-grained, compact, easily worked, very durable in contact with the soil; odorous; bands of small summer cells rather broad, conspicuous; medullary rays numerous, very obscure; color, dull red, the thin sap-wood nearly white; specific gravity, 0.4926; ash, 0.13; largely used for posts, sills, railway ties, interior finish, cabinet-making, and almost exclusively for lead-pencils.

A decoction of the leaves is occasionally used as a substitute for savine cerete, and an infusion of the berries as a diuretic (*U. S. Dispensatory*, 14 ed. 529.—*Nat. Dispensatory*, 2 ed. 795).

340.—*Taxodium distichum*, Richard,

Ann. Mus. xvi, 298; Conif. 52, t. 10.—Nouveau Duhamel, iii, 8.—Robin, Voyages, iii, 525.—Lambert, Pinus, 2 ed. 25 & t.—Torrey, Compend. Fl. N. States, 361; Bot. Mex. Boundary Survey, 210.—Brongniart in Ann. Sci. Nat. 1 ser. xxx, 182.—Loudon, Arboretum, iv, 2481, f. 2335-2339.—Forbes, Pinetum Woburn, 177, t. 60.—Endlicher, Syn. Conif. 68, in part.—Engelmann & Gray in Jour. Boston Soc. Nat. Hist. v, 234.—Scheele in Roemer, Texas, Appx. 447.—Lindley & Gordon in Jour. Hort. Soc. London, v, 269.—Knight, Syn. Conif. 20.—Darlington, Fl. Cestricea, 3 ed. 295.—Carrière, Trait. Conif. 143; 2 ed. 180; Rev. Hort. viii, 62 & f.—Morren in Belg. Hort. vi, 74 & t.—Gordon, Pinetum, 305; 2 ed. 382.—London Gard. Chronicle, 1857, 549.—Cooper in Smithsonian Rep. 1858, 257.—Chapman, Fl. S. States, 435.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 29.—Lesqueroux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 663; Bot. & Fl. 315.—Henkel & Hochstetter, Nadelhölz. 258.—Gray, Manual N. States, 5 ed. 473.—Hoopes, Evergreens, 364, f. 58.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 440.—Lawson, Pinetum Brit. ii, 305, f. 1-9.—Fowler in London Gard. Chronicle, 1872, 1526.—Young, Bot. Texas, 518.—Koch, Dendrologie, ii<sup>2</sup>, 195.—Bertrand in Bull. Soc. Bot. France, xviii, 127.—Vasey, Cat. Forest Trees, 36.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Veitch, Manual Conif. 214.—Ridgway in Proc. U. S. Nat. Mus. 87.—Watson in Proc. Am. Acad. xviii, 158.

*Cupressus disticha*, Linnæus, Spec. 1 ed. 1003.—Du Roi, Harbk. i, 201.—Marshall, Arbustum, 39.—Lamarck, Dict. ii, 244.—Wangenheim, Amer. 43.—Walter, Fl. Caroliniana, 238.—Aiton, Hort. Kew. iii, 372; 2 ed. v, 323.—Bartram, Travels, 2 ed. 88.—Michaux, Fl. Bor.-Am. ii, 208.—Desfontaines, Hist. Arb. ii, 567.—Willdenow, Spec. iv, 512; Enum. 991; Berl. Baumz. 111.—Schkuhr, Handb. iii, 288.—Michaux f. Hist. Arb. Am. iii, 4, t. 1; N. American Sylva, 3 ed. iii, 154, t. 151.—Pursh, Fl. Am. Sept. ii, 645.—Barton, Prodr. Fl. Philadelph. 93.—Rafinesque, Fl. Ludoviciana, 151.—Nuttall, Genera, ii, 224.—Hayne, Dend. Fl. 178.—James in Long's Exped. ii, 317, 318.—Elliott, Sk. ii, 642.—Beck, Bot. 238.—Eaton, Manual, 6 ed. 116.—Eaton & Wright, Bot. 215.—De Chambray, Trait. Arb. Res. Conif. 349.—Dickson & Brown in Am. Jour. Sci. 2 ser. v, 15.—Porcher, Resources S. Forests, 508.

*Cupressus disticha*, var. *patens* and var. *nutans*, Aiton, Hort. Kew. 2 ed. v, 323.

*Cupressus disticha*, var. *imbricaria*, Nuttall, Genera, ii, 224; Trans. Am. Phil. Soc. 2 ser. v, 163.—Croom in Am. Jour. Sci. 1 ser. xxviii, 166.

*Schubertia disticha*, Mirbel in Mem. Mus. xiii, 75.—Sprengel, Syst. iii, 890.—Spach, Hist. Veg. xi, 340.

*T. microphyllum*, Brongniart in Ann. Sci. Nat. 1 ser. xxx, 182.—Endlicher, Syn. Conif. 68.—Lindley & Gordon in Jour. Hort. Soc. London, v, 207.—Carrière, Trait. Conif. 148.

*T. adscendens*, Brongniart in Ann. Sci. Nat. 1 ser. xxx, 182.—Endlicher, Syn. Conif. 69.—Lindley & Gordon in Jour. Hort. Soc. London, v, 207.—Carrière, Trait. Conif. 148.

*T. distichum*, var. *patens* and var. *nutans*, Endlicher, Syn. Conif. 68.—Loudon, Arboretum, iv, 2481.

*T. distichum fastigiatum*, Knight, Syn. Conif. 21.—Carrière, Trait. Conif. 145; 2 ed. 181.—Gordon, Pinetum, 307; 2 ed. 383.—Henkel & Hochstetter, Nadelhölz. 260.—Hoopes, Evergreens, 367.

*T. distichum*, var. *microphyllum*, Henkel & Hochstetter, Nadelhölz. 261.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 441 (*T. Sinense pendulum*, Forbes, Pinetum Woburn, 180.—*Glyptostrobus pendulus*, Endlicher, Conif. 71.—Bot. Mag. t. 5603.—Carrière, Trait. Conif. 152.—*T. Sinense*, Gordon, Pinetum, 309.—*Cupressus Sinense*, Hort.).

*Cupresspnata disticha*, Nelson, Pinaceæ, 61.

BALD CYPRESS. BLACK CYPRESS. RED CYPRESS. WHITE CYPRESS. DECIDUOUS CYPRESS.

Sussex county, Delaware, south near the coast to Mosquito inlet and cape Romano, Florida, west through the Gulf states near the coast to the valley of the Nueces river, Texas, and through Arkansas to western Tennessee, western and northern Kentucky, southeastern Missouri, and southern Illinois and Indiana.

A large tree of great economic value, 24 to 46 meters in height, with a trunk 1.80 to 4 meters in diameter; deep, submerged swamps, river-bottom lands, and pine-barren ponds; common and forming extensive forests in the south Atlantic and Gulf states.

Wood light, soft, close, straight-grained, not strong, compact, easily worked, very durable in contact with the soil; bands of small summer cells broad, resinous, conspicuous; medullary rays numerous, very obscure; color, light or dark brown, the sap-wood nearly white; specific gravity, 0.4543; ash, 0.42; largely manufactured into lumber and used for construction, cooperage, railway ties, posts, fencing, etc., often injured, especially west of the Mississippi river, by a species of *Dadalia*, not yet determined, rendering it unfit for lumber.

Two varieties of cypress, black and white, are recognized by lumbermen, the wood of the former heavier than water when green, rather harder and considered more durable than the other; the unseasoned wood of the latter lighter than water and rather lighter colored than black cypress.

### 341.—*Sequoia gigantea*, Decaisne,

Bull. Bot. Soc. France, i, 70; Rev. Hort. 1855, 9, t. 10, f. 1.—Gray in Proc. Am. Acad. iii, 94; Am. Jour. Sci. 2 ser. xvii. 440; xviii, 150, 286.—Torrey in Pacific R. R. Rep. iv, 140.—Kellogg in Proc. California Acad. i, 42.—Blake in Pacific R. R. Rep. v, 257, t. 13.—Carrière, Trait. Conif. 166.—Newberry in Pacific R. R. Rep. vi, 90.—Cooper in Smithsonian Rep. 1858, 263.—Wood, Bot. & Fl. 315.—Bloomer in Proc. California Acad. iii, 397.—Hoopes, Evergreens, 239, f. 29.—Parlatore in De Candolle Prodr. xvi<sup>2</sup>, 437.—Koch, Dendrologie, ii<sup>2</sup>, 194.—Bertrand in Ann. Sci. Nat. 5 ser. xx, 114.—Vasey, Cat. Forest Trees, 36.—Muir in Proc. Am. Assoc. xxv, 242.—Watson, Bot. California, ii, 117.

*Wellingtonia gigantea*, Lindley in London Gard. Chronicle, 1853, 819, 823; Bot. Mag. t. 4777, 4778.—C. Lemaire in Ill. Hort. 1854, 14 & t.—Naudin in Rev. Hort. 1854, 116.—Fl. des Serres, ix, 93 & t. 903 & t.—Flor. Cabinet, 1854, 121 & t.—Bigelow in Pacific R. R. Rep. iv, 22.—Gordon, Pinetum, 330; Suppl. 106; 2 ed. 415.—Murray in Edinburgh New Phil. Jour. new ser. xi, 205, t. 3-9 (Trans. Bot. Soc. Edinburgh, vi, 330, t. 6, f. 8, 9).—Henkel & Hochstetter, Nadelhölz. 222.—Carrière, Trait. Conif. 2 ed. 217.—Veitch, Manual Conif. 415.

*Wellingtonia Californica*, Winslow in California Farmer, September, 1854.—Hooker, Jour. Bot. & Kew Misc. vii, 26.

*Taxodium Washingtonianum*, Winslow in California Farmer, September, 1854.

*Taxodium giganteum*, Kellogg & Behr in Proc. California Acad. i, 51.

*S. Wellingtonia*, Seemann in Bonplandia, ii, 238; iii, 27; vi, 343; Ann. & Mag. Nat. Hist. 3 ser. March, 1859, 161.—Lawson, Pinetum Brit. iii, 299, t. 37, 51, 53, f. 1-37.

*Gigantabies Wellingtonia*, Nelson, Pinacea, 79.

### BIG TREE.

California, western slopes of the Sierra Nevadas from Placer county (Calaveras Grove) south to Deer creek on the southern borders of Tulare county.

The largest tree of the American forest, 76 to 119 meters in height, with a trunk 6 to 11 meters in diameter; valleys and moist swales or hollows between 4,000 and 6,000 feet elevation, growing in small, isolated groves, except toward its southern limits, here mixed with the sugar pine and red and white firs, covering large tracts, often several hundred acres in extent.

Wood very light, soft, weak, brittle, rather coarse-grained, compact, remarkably durable in contact with the soil; bands of small summer cells thin, dark colored, conspicuous; medullary rays numerous, thin; color, bright clear red, turning much darker with exposure, the thin sap-wood white; specific gravity, 0.2882; ash, 0.50; in Fresno county formerly somewhat manufactured into lumber and locally used for fencing, shingles, construction, etc.

### 342.—*Sequoia sempervirens*, Endlicher,

Syn. Conif. 198.—Decaisne in Rev. Hort. 1855, 9, t. 11, f. 2.—Carrière, Trait. Conif. 164; 2 ed. 210.—Bigelow in Pacific R. R. Rep. iv, 23.—Newberry in Pacific R. R. Rep. vi, 57, 90, f. 23.—Torrey in Pacific R. R. Rep. iv, 140; Bot. Mex. Boundary Survey, 210; Ives' Rep. 28.—Gordon, Pinetum, 303; Suppl. 97; 2 ed. 379.—Cooper in Smithsonian Rep. 1858, 263.—Murray in Edinburgh New Phil. Jour. new ser. xi, 221 (Trans. Bot. Soc. Edinburgh, vi, 346).—Seemann in Ann. & Mag. Nat. Hist. 3 ser. March, 1859, 165.—Wood, Bot. & Fl. 315.—Bolander in Proc. California Acad. iii, 231.—Hoopes, Evergreens, 244.—Parlatore in De Candolle Prodr. xvi<sup>2</sup>, 436.—Koch, Dendrologie, ii<sup>2</sup>, 193.—Vasey, Cat. Forest Trees, 36.—Stearns in Am. Nat. x, 110.—Watson, Bot. California, ii, 116.—Veitch, Manual Conif. 212.—Lawson, Pinetum Brit. iii, t. 52 & figs.

*Taxodium sempervirens*, Lambert, Pinus, 114; 2 ed. ii, 107, t. 52.—London, Arboretum, iv, 2487, f. 2340, 2341.—Hooker, Fl. Bor.-Am. ii, 164; Icon. iv, t. 379.—Hooker & Arnott, Bot. Beechey, 1841.—Fremont, Geographical Mem. California, 36, 37.—Henkel & Hochstetter, Nadelhölz. 262.

*Taxodii* species, Douglas in Companion Bot. Mag. ii, 150.

*Sequoia gigantea*, Endlicher, Syn. Conif. 190, in part.—Bentham, Pl. Hartweg. 338.

*Abies religiosa*, Hooker & Arnott, Bot. Beechey, 160.

*Schubertia sempervirens*, Spach, Hist. Veg. xi, 353.

*S. religiosa*, Presl, Epimel. Bot. 357.—Walpers, Ann. iii, 448.

*Gigantabies taxifolia*, Nelson, Pinaceæ, 78.

## REDWOOD.

California, from the northern boundary of the state, south through the Coast ranges to "Veers creek" near the southern border of Monterey county.

A large tree of great economic value, 61 to 92 meters in height, with a trunk 2.40 to 7 meters in diameter, sending up from the stump when cut many vigorous shoots; sides of cañons and gulches in low, wet situations, borders of streams, etc., not appearing on dry hillsides; generally confined to the western slopes of the Coast ranges, and nowhere extending far from the coast; most generally multiplied and reaching its greatest average density north of cape Mendocino.

Wood light, soft, not strong, very brittle, rather coarse-grained, compact, susceptible of a good polish, easily split and worked, very durable in contact with the soil; bands of small summer cells thin, dark colored, conspicuous; medullary rays numerous, very obscure; color, clear light red, the thin sap-wood nearly white; specific gravity, 0.4208; ash, 0.14; largely sawed into lumber; the prevailing and most valuable building material of the Pacific coast, and in California almost exclusively used for shingles, fence posts, telegraph poles, railway ties, wine-butts, tanning- and water-tanks, coffins, etc.; forms with curled or contorted grain are highly ornamental.

343.—*Taxus brevifolia*, Nuttall,

Sylva, iii, 86, t. 108; 2 ed. ii, 149, t. 108 (*T. occidentalis* on plate).—Torrey in Pacific R. R. Rep. iv, 140.—Newberry in Pacific R. R. Rep. vi, 60, 90, f. 26.—Cooper in Smithsonian Rep. 1858, 203; Pacific R. R. Rep. xii<sup>3</sup>, 26, 69; Am. Nat. iii, 414.—Wood, Bot. & Fl. 316.—Bolander in Proc. California Acad. iii, 229.—Carrière, Trait. Conif. 2 ed. 742.—Hoopes, Evergreens, 383.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 501.—Gray in Proc. Am. Acad. vii, 402.—Koeh, Dendrologie, ii<sup>2</sup>, 95.—Gordon, Pinetum, 2 ed. 392.—Vasey, Cat. Forest Trees, 35.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Hall in Coulter's Bot. Gazette, ii, 91.—Watson, Bot. California, ii, 110.—G. M. Dawson in Canadian Nat. new ser. ix, 329.—Veitch, Manual Conif. 305.

*T. baccata*, var. *Canadensis*, Bentham, Pl. Hartweg. 338.

*T. baccata*, Hooker, Fl. Bor.-Am. ii, 167, in part.

*T. Boursierii*, Carrière in Rev. Hort. 1854, 228 & t.; Trait. Conif. 523; 2 ed. 739.

*T. Lindleyana*, Murray in Edinburgh New Phil. Jour. new ser. i, 294; Trans. Bot. Soc. Edinburgh, vi, 1860.—Lawson, Cat. 1855, 15.—Gordon, Pinetum, 316; Suppl. 99.—Henkel & Hochstetter, Nadelhölz. 360.—Nelson, Pinaceæ, 174.

*T. Canadensis*, Bigelow in Pacific R. R. Rep. iv, 25 [not Willdenow].

## YELLOW.

Queen Charlotte islands and the valley of the Skeena river, south through the Coast ranges of British Columbia, through western and the mountain ranges of eastern Washington territory and Oregon to the western slopes of the Rocky mountains of northern Montana (*Canby & Sargent*), through the California Coast ranges to the bay of Monterey and along the western slopes of the Sierra Nevadas to about latitude 37° N.

A tree 18 to 24 meters in height, with a trunk 0.60 to 0.90 meter in diameter, or toward its eastern limits in Idaho and Montana much smaller, often reduced to a low shrub; rare; low, rich woods and borders of streams, reaching its greatest development in western Oregon, Washington territory, and British Columbia.

Wood heavy, hard, strong, brittle, very close-grained, compact, susceptible of a beautiful polish, very durable in contact with the soil; bands of small summer cells thin, dark colored, conspicuous; medullary rays thin, numerous, very obscure; color, light bright red, the thin sap-wood light yellow; specific gravity, 0.6391; ash, 0.22; used for fence posts and by the Indians of the northwest coast for paddles, spear handles, bows, fish-hooks, etc.

344.—*Taxus Florida*, Nuttall,

Sylva, iii, 92; 2 ed. ii, 155.—Croom in Am. Jour. Sci. 1 ser. xxvi, 334.—Chapman, Fl. S. States, 436.—Carrière, Trait. Conif. 2 ed. 741.—Hoopes, Evergreens, 384.—Vasey, Cat. Forest Trees, 36.

*T. montana*, Nuttall, Sylva, iii, 92; 2 ed. ii, 155.

YEW.

Western Florida, banks of the Apalachicola river from Bristol to Aspalaga, Gadsden county, and Watson's Landing? (*Curtiss*).

A small tree, 3 to 6 meters in height, with a trunk 0.15 to 0.25 meter in diameter; rare and very local.

Wood heavy, hard, very close-grained, compact; bands of small summer cells very thin, dark colored, not conspicuous; medullary rays numerous, obscure; color, dark brown tinged with red, the thin sap-wood nearly white; specific gravity, 0.6340; ash, 0.21.

345.—*Torreya taxifolia*, Arnott,

Ann. Nat. Hist. i, 134; Hooker, Icon. iii, t. 232, 233.—Eaton & Wright, Bot. 454.—Nuttall, Sylva, iii, 91, t. 109; 2 ed. ii, 153, t. 109.—Spach, Hist. Veg. xi, 293.—Endlicher, Syn. Conif. 241.—Lindley & Gordon in Jour. Hort. Soc. London, v, 226.—Darby, Bot. S. States, 516.—Carrière, Trait. Conif. 514; 2 ed. 726.—Gordon, Pinetum, 329; 2 ed. 412.—Cooper in Smithsonian Rep. 1858, 259.—Chapman, Fl. S. States, 436.—Wood, Cl. Book, 664; Bot. & Fl. 316.—Hoopes, Evergreens, 387, f. 62.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 505.—Koch, Dendrologie, ii<sup>2</sup>, 100.—Vasey, Cat. Forest Trees, 35.—Veitch, Manual Conif. 311.

*Caryotaxus taxifolia*, Henkel & Hochstetter, Nadelhölz. 367.

*Fatataxus montana*, Nelson, Pinacæ, 167.

STINKING CEDAR. SAVIN.

Western Florida, eastern bank of the Apalachicola river from Chattahoochee to the neighborhood of Bristol, Gadsden county; doubtfully reported from the shores of a small lake west of Ocheesee and at Wakulla Springs, Wakulla county (*Curtiss*).

A tree 12 to 18 meters in height, with a trunk 0.60 to 0.90 meter in diameter, sending up when cut many vigorous shoots from the stem and roots; borders of swamps on calcareous soil; very rare and local.

Wood light, rather hard, strong, brittle, very close-grained, compact, susceptible of a beautiful polish, very durable in contact with the soil; bands of small summer cells very thin, not conspicuous; medullary rays numerous, obscure; color, clear bright yellow, the thin sap-wood much lighter; specific gravity, 0.5145; ash, 0.73; largely used locally for fence posts, etc.

346.—*Torreya Californica*, Torrey,

N. York Jour. Pharm. iii, 49; Pacific R. R. Rep. iv, 140.—Bigelow in Pacific R. R. Rep. iv, 24.—Kollogg in Proc. California Acad. i, 35.—Newberry in Pacific R. R. Rep. vi, 61, 90, f. 27.—Cooper in Smithsonian Rep. 1858, 263.—Bolander in Proc. California Acad. iii, 229.—Hoopes, Evergreens, 385.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 506.—Koch, Dendrologie, ii<sup>2</sup>, 101.—Gordon, Pinetum, 2 ed. 410.—Vasey, Cat. Forest Trees, 35.—Watson, Bot. California, ii, 110.

*T. Myristica*, Hooker f. in Bot. Mag. t. 4780.—Van Houtte in Fl. des Serres, ix, 175 & t.—Carrière, Conif. 315; 2 ed. 727.—Gordon, Pinetum, 1 ed. 327.—Murray in Edinburgh New Phil. Jour. new ser. x, 7, t. 3.—Veitch, Manual Conif. 311.

*Caryotaxus Myristica*, Henkel & Hochstetter, Nadelhölz. 368.

*Fatataxus Myristica*, Nelson, Pinacæ, 168.

CALIFORNIA NUTMEG. STINKING CEDAR.

California, Mendocino county, and along the western slope of the Sierra Nevadas to Tulare county, between 3,000 and 5,000 feet elevation.

A tree 15 to 22 meters in height, with a trunk 0.30 to 0.90 meter in diameter, sending up from the stump when cut many vigorous shoots; borders of streams, in moist soil; rare.

Wood light, soft, not strong, very close-grained, compact, susceptible of a fine polish, very durable in contact with the soil; bands of small summer cells broad, not conspicuous; medullary rays numerous, obscure; color, clear light yellow, the thin sap-wood nearly white; specific gravity, 0.4760; ash, 1.34.

347.—*Pinus Strobus*, Linnaeus,

Spec. 1 ed. 1001; Du Roi, Harbk. ii, 57.—Wangenheim, Amer. i, t. 1, f. 1.—Aiton, Hort. Kew. iii, 369; 2 ed. v, 318.—Swartz, Obs. 363.—Möench, Meth. 364.—Michaux, Fl. Bor.-Am. ii, 205.—Poiret in Lamarck, Diet. v, 341; Ill. iii, 369, t. 786, f. 2.—Lambert, Pinus, 1 ed. t. 22; 2 ed. i, 27, t. 35; 3 ed. i, 51, t. 32.—Willdenow, Spec. iv, 501; Enum. 989; Berl Baumz. 213.—Persoon, Syn. ii, 579.—Desfontaines, Hist. Arb. ii, 612.—Michaux f. Hist. Arb. Am. i, 104, t. 10; N. American Sylva, 3 ed. iii, 126, t. 145.—Nouveau Duhamel, v, 249, t. 76.—Smith in Rees' Cycl. xxviii, No. 17.—Pursh, Fl. Am. Sept. ii, 644.—Eaton, Manual, 110; 6 ed. 265.—Nuttall, Genera, ii, 223; Sylva, iii, 118; 2 ed. ii, 176 (excl. syn. var. *monticola*).—Hayne, Dend. Fl. 175.—Elliott, Sk. ii, 638.—Sprengel, Syst. ii, 887.—Torrey, Compend. Fl. N. States, 300; Fl. N. York, ii, 229.—Richard, Conif. 60, t. 12, f. 2.—Audubon, Birds, t. 39.—Beck, Bot. 339.—London, Arboretum, iv, 2280, f. 2193–2196.—Forbes, Pinetum Woburn. 83.—Hooker, Fl. Bor.-Am. ii, 161.—Eaton & Wright, Bot. 359.—Bigelow, Fl. Boston. 3 ed. 385.—Antoine, Conif. 43, t. 20, f. 3.—Lindley in Penn. Cycl. xvii, 173.—Link in Linnaea, xv, 514.—Spach, Hist. Vég. xi, 394.—De Chambray, Trait. Arb. Res. Conif. 262, t. 4, 5, f. 8.—Emerson, Trees Massachusetts, 60; 2 ed. i, 73 & t.—Endlicher, Syn. Conif. 147.—Giboul, Arb. Resin. 35, t. 5.—Knight, Syn. Conif. 34.—Lindley & Gordon in Jour. Hort. Soc. London. v, 215.—Carrière, Trait. Conif. 302; 2 ed. 398.—Buckley in Am. Jour. Sci. 2 ser. xiii, 398.—Darlington, Fl. Cestrica, 3 ed. 290.—Darby, Bot. S. States, 515.—Gordon, Pinetum, 239; 2 ed. 322.—Cooper in Smithsonian Rep. 1858, 257.—Fascali, Forst. Pfl. 56, t. 11, f. 7–13.—Chapman, Fl. S. States, 434.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 25.—Wood, Cl. Book, 660; Bot. & Fl. 312.—Porcher, Resources S. Forests, 505.—Henkel & Hochstetter, Nadelholz. 92.—Nelson, Pinacea, 130.—Hoopes, Evergreens, 136, f. 19.—Gray, Manual N. States, 5 ed. 470.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 405.—Schmidlein, Icon. t. 77, f. 10.—Koch, Dendrologie, ii<sup>2</sup>, 319.—Vasey, Cat. Forest Trees, 32.—Macoun in Geological Rep. Canada, 1875–76, 211.—Sears in Bull. Essex Inst. xiii, 187.—Veitch, Manual Conif. 183.—Bell in Geological Rep. Canada, 1879–80, 49c.

*P. Strobus*, var. *alba*, var. *brevifolia*, var. *compressa*, London, Arboretum, iv, 2280.—Lindley & Gordon in Jour. Hort. Soc. London, v, 215.

*P. Strobus*, var. *nivea*, Hort.

## WHITE PINE. WEYMOUTH PINE.

Newfoundland, northern shores of the gulf of Saint Lawrence to lake Nipigon and the valley of the Winnipeg river, south through the northern states to Pennsylvania, the southern shores of lake Michigan, "Starving rock," near La Salle, Illinois, near Davenport, Iowa (*Perry*), and along the Alleghany mountains to northern Georgia.

A large tree of the first economic value, 24 to 52 meters in height, with a trunk 1.20 to 3.50 meters in diameter; sandy loam upon drift formations, forming extensive forests, or in the region of the great lakes often in small bodies scattered through the hard-wood forests, here reaching its greatest development; north of latitude 47° N. and south of Pennsylvania, central Michigan, and Minnesota much smaller, less common and valuable.

Wood light, soft, not strong, very close, straight-grained, compact, easily worked, susceptible of a beautiful polish; bands of small summer cells thin, not conspicuous, resin passages small, not numerous nor conspicuous; medullary rays numerous, thin; color, light brown, often slightly tinged with red, the sap-wood nearly white; specific gravity, 0.3854; ash, 0.19; more largely manufactured into lumber, shingles, laths, etc., than that of any other North American tree; the common and most valuable building material of the northern states; largely used in cabinet-making, for interior finish, and in the manufacture of matches, woodenware, and for many domestic purposes.

*Coniferin*, a glucoside principle, has been discovered in the cambium layer of this and several other species of *Coniferæ* (*Jour. für Prakt. Chem.* xvii, 243.—*Am. Jour. Pharm.* 1867, 261.—*U. S. Dispensatory*, 14 ed. 901).

348.—*Pinus monticola*, Douglas;

Lambert, Pinus, 1 ed. iii, 27, t. 35.—London, Arboretum, iv, 2291, f. 2208, 2209.—Forbes, Pinetum Woburn. 81, t. 31.—Antoine, Conif. 40, t. 18, f. 3.—Hooker & Arnott, Bot. Beechey, 394.—Endlicher, Syn. Conif. 148.—Lindley & Gordon in Jour. Hort. Soc. London, v, 215.—Carrière, Trait. Conif. 305; 2 ed. 401.—Gordon, Pinetum, 233; 2 ed. 314.—Cooper in Smithsonian Rep. 1858, 262; Pacific R. R. Rep. xii<sup>2</sup>, 27; Am. Nat. iii, 410.—Lyll in Jour. Linnæan Soc. vii, 141.—Henkel & Hochstetter, Nadelholz. 94.—Nelson, Pinacea, 120.—Hoopes, Evergreens, 135.—Bolander in Proc. California Acad. iii, 318.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 405.—Gray in Proc. Am. Acad. vii, 402.—Fowler in London Gard. Chronicle, 1872, 1071.—Koch, Dendrologie, ii<sup>2</sup>, 322.—Vasey, Cat. Forest Trees, 32.—Macoun in Geological Rep. Canada, 1875–76, 211.—Hall in Coulter's Bot. Gazette, ii, 91.—Engelmann in Bot. California, ii, 123.—G. M. Dawson in Canadian Nat. new ser. ix, 328.—Veitch, Manual Conif. 181, f. 41.—Lawson, Pinetum Brit. i, 69, f. 1–8.

*P. Strobus*, var. *monticola*, Nuttall, Sylva, iii, 118; 2 ed. ii, 176.

*P. Grozeleri*, Carrière in Rev. Hort. 1869, 126.

*P. porphyrocarpa*, Lawson, Pinetum Brit. i, 83, f. 1–8.

## WHITE PINE.

Vancouver's island, Coast and Gold ranges of southern British Columbia, through the Cœur d'Alêne and Bitter Root mountains of Idaho to the valley of the Flathead river, northern Montana (*Canby & Sargent*), south along the Cascade mountains of Washington territory and Oregon and the California sierras to Calaveras county.

A large tree, 30 to 46 meters in height, with a trunk 0.90 to 1.50 meter in diameter; most common and reaching its greatest development in the Pend d'Oreille and Clark's Fork regions of Idaho, here a valuable and important timber tree; in British Columbia generally below 3,000 feet, and in California between 7,000 and 10,000 feet elevation; not common.

Wood very light, soft, not strong, close, straight-grained, compact; bands of small summer cells thin, resinous, not conspicuous, resin passages numerous, not large, conspicuous; medullary rays numerous, obscure; color, light brown or red, the sap-wood nearly white; specific gravity, 0.3908; ash, 0.23; inferior in quality, although resembling that of the eastern white pine (*P. Strobus*); in Idaho and Montana somewhat manufactured into lumber.

### 349.—*Pinus Lambertiana*, Douglas,

Companion Bot. Mag. ii, 92, 106, 107, 130, 152; Trans. Linnæan Soc. xv, 500.—Lambert, *Pinus*, 1 ed. iii, 157, t. 68, 69.—Loudon, *Arboretum*, iv, 2288, f. 2203.—Forbes, *Pinetum Woburn*, 77, t. 30.—Hooker, *Fl. Bor.-Am.* ii, 161.—Antoine, *Conif.* 41, t. 19.—Lindley in *Penn. Cycl.* xvii, 173.—Hooker & Arnott, *Bot. Beechey*, 394.—Spach, *Hist. Veg.* xi, 397.—Nuttall, *Sylva*, iii, 122, t. 114; 2 ed. ii, 180, t. 114.—De Chambray, *Trait. Arb. Res. Conif.* 346.—Endlicher, *Syn. Conif.* 150.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 215.—Carrière, *Trait. Conif.* 307; 2 ed. 403.—Bigelow in *Pacific R. R. Rep.* iv, 21.—Torrey in *Pacific R. R. Rep.* iv, 141; *Bot. Mex. Boundary Survey*, 210; *Ives' Rep.* 28.—Newberry in *Pacific R. R. Rep.* vi, 42, 90, f. 14.—Gordon, *Pinetum*, 228; 2 ed. 307.—Cooper in *Smithsonian Rep.* 1858, 262.—Murray in *Trans. Bot. Soc. Edinburgh*, vi, 369.—Lawson, *Pinetum Brit. i.* 47, t. 7, f. 1-7.—Bolander in *Proc. California Acad.* iii, 226, 317.—Henkel & Hochstetter, *Nadelhölz.* 95.—Nelson, *Pinaceæ*, 115.—Hoopes, *Evergreens*, 134.—Parlatore in *De Candolle, Prodr.* xvi<sup>2</sup>, 402.—Fowler in *London Gard. Chronicle*, 1872, 1071.—Koch, *Dendrologie*, ii<sup>2</sup>, 323.—Vasey, *Cat. Forest Trees*, 32.—Veitch, *Manual Conif.* 179.

### SUGAR PINE.

Oregon, Cascade and Coast ranges, from the head of the Mackenzie river and the valley of the Rogue river south along the western flank of the California sierras, through the Coast ranges to the Santa Lucia mountains, and in the San Bernardino and Cuyamaca mountains.

A large tree, 46 to 92 meters in height, with a trunk 3 to 7 meters in diameter; most common and reaching its greatest development upon the sierras of central and northern California between 4,000 and 8,000 feet elevation; in the Oregon Coast ranges descending to 1,000 feet above the sea-level.

Wood very light, soft, coarse, straight-grained, compact, satiny, easily worked; bands of small summer cells thin, resinous, conspicuous, resin passages numerous, very large and conspicuous; medullary rays numerous, obscure; color, light brown, the sap-wood nearly white; specific gravity, 0.3684; ash, 0.22; now largely manufactured into lumber and used for interior finish, door-blinds, sashes, etc., and for cooperage and woodenware; less valuable and less easily worked than that of the eastern white pine (*Pinus Strobus*); its quality injured by the larger and more numerous resin passages.

A saccharine exudation from the stumps of cut or partially-burned trees sometimes used as a substitute for sugar.

### 350.—*Pinus flexilis*, James,

Long's Exped. ii, 27, 34.—Torrey in *Ann. Lye. N. York*, ii, 249; *Pacific R. R. Rep.* iv, 141.—Eaton, *Manual*, 6 ed. 265.—Eaton & Wright, *Bot.* 359.—Nuttall, *Sylva*, iii, 107, t. 112; 2 ed. ii, 167, t. 107.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 220.—Carrière in *Fl. des Serres*, ix, 200; *Rev. Hort.* 1854, 228; *Trait. Conif.* 310; 2 ed. 392.—Bigelow in *Pacific R. R. Rep.* iv, 6, 20.—Gordon, *Pinetum*, 224; 2 ed. 302.—Cooper in *Smithsonian Rep.* 1858, 262.—Parry in *Trans. St. Louis Acad.* ii, 121.—Engelmann in *Am. Jour. Sci.* 2 ser. xxxiv, 331; *Trans. St. Louis Acad.* ii, 208; *Wheeler's Rep.* vi, 257; *Bot. California*, ii, 124.—Henkel & Hochstetter, *Nadelhölz.* 126.—Nelson, *Pinaceæ*, 112.—Bolander in *Proc. California Acad.* iii, 318.—Hoopes, *Evergreens*, 131, f. 18.—Parlatore in *De Candolle, Prodr.* xvi<sup>2</sup>, 403.—Porter in *Hayden's Rep.* 1871, 494.—Watson in *King's Rep.* v, xxviii, 332; *Pl. Wheeler*, 17.—Rothrock, *Pl. Wheeler*, 27, 50; *Wheeler's Rep.* vi, 9.—Porter & Coulter, *Fl. Colorado*; *Hayden, Surv. Misc. Pub. No.* 4, 130.—Murray in *London Gard. Chronicle*, 1875, 106.—Vasey, *Cat. Forest Trees*, 32.—Sargent in *Am. Jour. Sci.* 3 ser. xvii, 420.—Lawson, *Pinetum Brit. i.* 35, f. 1.

*P. Lambertiana*, var. *Hooker*, *Fl. Bor.-Am.* ii, 161.

*P. Lambertiana*, var. *brevifolia*, Endlicher, *Syn. Conif.* 150.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 215.—Carrière, *Trait. Conif.* 2 ed. 404.

*P. flexilis*, var. *serrulata*, Engelmann in *Wheeler's Rep.* vi, 258.

*P. flexilis*, var. *macrocarpa*, Engelmann in *Wheeler's Rep.* vi, 258.

### WHITE PINE.

Eastern slopes of the Rocky mountains, Montana, and probably much farther north, south to New Mexico, on the Guadalupe and Limpia mountains, western Texas (*Havard*), on the high mountain ranges of Utah, Nevada, and northern Arizona, Inyo mountains and mount Silliman, California.

A tree 15 to 18 meters in height, with a trunk 0.60 to 1.20 meter in diameter; dry, gravelly slopes and ridges between 4,000 and 10,000 feet elevation; common along the eastern slopes of the Rocky mountains of northern Montana, forming open, scattered forests, here low, round-topped, and the prevailing forest tree; in central Nevada the most valuable lumber tree of the region.

Wood light, soft, close-grained, compact; bands of small summer cells narrow, not conspicuous, resin passages numerous, large; medullary rays numerous, conspicuous; color, light clear yellow, turning red with exposure, the sap-wood nearly white; specific gravity, 0.4358; ash, 0.28; in northern Montana, Nevada, and Utah sometimes sawed into inferior lumber and used in construction and for various domestic purposes.

351.—*Pinus albicaulis*, Engelmann,

Trans. St. Louis Acad. ii, 209; Coulter's Bot. Gazette, vii, 4.—Gray in Proc. Am. Acad. vii, 402.—Vasey, Cat. Forest Trees, 32.—Hall in Coulter's Bot. Gazette, ii, 91.—Lawson, Pinetum Brit. i, 1, f. 1-4.

*P. flexilis*, Murray, Rep. Oregon Exped. i, t. 2, f. 1 [not James].—Lyll in Jour. Linnæan Soc. vii, 142.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 403, in part.

*P. cembroides*, Newberry in Pacific R. R. Rep. vi, 44, 90, f. 15 [not Zuccarini].

*P. Shasta*, Carrière, Trait. Conif. 2 ed. 390.

*P. flexilis*, var. *albicaulis*, Engelmann in Bot. California, ii, 124.—G. M. Dawson in Canadian Nat. new. ser. ix, 328.

Coast ranges of British Columbia, from the valley of the Lltasyouco river (*G. M. Dawson*) south along the Cascade and Blue mountains of Washington territory and Oregon, extending east along the high ranges of northern Washington territory to the eastern slope of the Rocky mountains of northern Montana (Old Marias pass, *Canby & Sargent*); California, Scott's mountains, mount Shasta, and on the high peaks of the Sierra Nevadas to mount San Bernardino.

A small alpine tree, 6 to 12 meters in height, with a trunk rarely 0.60 meter in diameter, or at its highest elevation reduced to a low, prostrate shrub; dry, gravelly ridges at the extreme limit of tree growth, reaching in the San Bernardino mountains an elevation of 10,500 feet.

Wood light, soft, not strong, brittle, close-grained, compact; bands of small summer cells thin, not conspicuous, resin passages numerous, not large; medullary rays numerous, obscure; color, light brown, the sap-wood nearly white; specific gravity, 0.4165; ash, 0.27.

352.—*Pinus reflexa*, Engelmann,

Coulter's Bot. Gazette, vii, 4.—Rusby in Bull. Torrey Bot. Club, ix, 80.

*P. flexilis*, var. *reflexa*, Engelmann in Wheeler's Rep. vi, 258.

## WHITE PINE.

High mountains of southwestern New Mexico (*Greene, Rusby*) to the Santa Rita mountains (*Rothrock, Engelmann & Sargent*) and Santa Catalina mountains (*Lemmon, Pringle*), Arizona.

A tree 24 to 30 meters in height, with a trunk sometimes exceeding 0.60 meter in diameter; rocky ridges and slopes of almost inaccessible cañons between 6,000 to 8,000 feet elevation.

Wood light, hard, not strong, close-grained, compact; bands of small summer cells thin, resinous, not conspicuous, resin passages large, not numerous; medullary rays numerous, obscure; color, light red, the sap-wood nearly white; specific gravity, 0.4877; ash, 0.26.

353.—*Pinus Parryana*, Engelmann,

Am. Jour. Sci. 2 ser. xxiv, 332, note; Bot. California, ii, 124.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 402.—Vasey, Cat. Forest Trees, 30.

*P. Llaveana*, Torrey, Bot. Mex. Boundary Survey, 208, t. 55 [not Schiede & Deppé].—Cooper in Smithsonian Rep. 1858, 262.—Bolander in Proc. California Acad. iii, 318.

## PIÑON. NUT PINE.

California, Larkin's station, 20 miles southeast of Campo, San Diego county (*Vasey*), and southward into Lower California.

A small tree, 6 to 9 meters in height, with a trunk 0.30 to 0.45 meter in diameter; very rare within the limits of the United States; south of the boundary forming extensive open forests upon the high *mesas* and slopes of Lower California (*Pringle*).

Wood light, soft, close-grained, compact; bands of small summer cells thin, not conspicuous, resin passages very numerous, large, conspicuous; medullary rays numerous, obscure; color, light brown or yellow, the sap-wood much lighter, nearly white; specific gravity, 0.5675; ash, 0.54.

The large seeds edible.

354.—*Pinus cembroides*, Zuccarini,

Flora, ii, 93.—Endlicher, Syn. Conif. 182.—Fl. des Serres, iv, 3446, t. 97.—Nelson, Pinaceæ, 107.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 397.—Engelmann in Trans. St. Louis Acad. iv, 176.—Watson in Proc. Am. Acad. xviii, 158.

*P. Llaveana*, Schiede & Deppe in Linnæa, xii, 488.—Forbes, Pinetum Woburn. 49, t. 17.—Antoine, Conif. 36, t. 16, f. 1.—Spach, Hist. Veg. xi, 401.—Lindley & Gordon in Jour. Hort. Soc. London, v, 216.—Carrière, Trait. Conif. 405; 2 ed. 461.—Gordon, Pinetum, 199; 2 ed. 274 (excl. syn. *edulis*).—Henkel & Hochstetter, Nadelhölz. 64 (excl. syn. *edulis*).—Hoopes, Evergreens, 143.

*P. oostosperma*, Engelmann in Wislizenus' Rep. No. 3.—Lindley & Gordon in Jour. Hort. Soc. London, v, 216.—Carrière in Fl. des Serres, ix, 200; Rev. Hort. 1854, 227.

## NUT PINE.

Santa Catalina mountains, Arizona (*Pringle*); through northern Mexico.

A small tree, in Arizona 6 to 7 meters in height, with a trunk hardly exceeding 0.30 meter in diameter; dry ridges and slopes at 3,500 feet elevation.

Wood light, soft, very close-grained, compact; bands of small summer cells thin, not conspicuous, resin passages few, small; medullary rays numerous, obscure; color, light clear yellow, the sap-wood nearly white; specific gravity, 0.6512; ash, 0.90.

The seeds edible.

355.—*Pinus edulis*, Engelmann,

Wislizenus' Rep. No. 4; Wheeler's Rep. vi, 260.—Lindley & Gordon in Jour. Hort. Soc. London, v, 216.—Carrière, Fl. des Serres, ix, 201; Rev. Hort. 1854, 227; Trait. Conif. 408.—Torrey in Sitgreaves' Rep. 173, t. 20; Pacific R. R. Rep. iv, 140; Ives' Rep. 28.—Bigelow in Pacific R. R. Rep. iv, 3, 19.—Cooper in Smithsonian Rep. 1858, 261.—Hoopes, Evergreens, 142.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 398.—Watson in Pl. Wheeler, 17.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 130.—Vasey, Cat. Forest Trees, 30.—Rothrock in Wheeler's Rep. vi, 9.—Rusby in Bull. Torrey Bot. Club, ix, 106.—Voitch, Manual Conif. 172.

*P. cembroides*, Gordon in Jour. Hort. Soc. London, v, 236 & f.; Pinetum, 192; 2 ed. 265 [not Zuccarini].—Fl. des Serres, iv, 324<sup>b</sup>, 325<sup>b</sup>, t. 331, f. 97.—Lindley & Gordon in Jour. Hort. Soc. London, v, 216.—Carrière, Trait. Conif. 404; 2 ed. 460.

*P. futilis*, Roehl in herb. *filæ* Gordon, Pinetum, Suppl. 76; 2 ed. 265.

## PIÑON. NUT PINE.

Eastern base of Pike's peak, Colorado, south through New Mexico to the mountains of western Texas.

A small tree, 6 to 9 meters in height, with a trunk 0.30 to 0.90 meter in diameter; dry *mesas* and slopes, generally on lime or sandstone, reaching in Colorado an elevation of 9,000 feet.

Wood light, soft, not strong, brittle, close-grained, compact, durable in contact with the soil; bands of small summer cells thin, not conspicuous, resin passages few, small; medullary rays numerous, obscure; color, light brown, the sap-wood nearly white; specific gravity, 0.6388; ash, 0.62; largely used for fuel, charcoal, fencing, etc., and in western Texas occasionally manufactured into inferior lumber.

The large edible nuts supply the Indians with a valuable article of food.

356.—*Pinus monophylla*, Torrey & Fremont,

Fremont's Rep. 319, t. 4.—Cooper in Smithsonian Rep. 1858, 261.—Bolander in Proc. California Acad. iii, 318.—Hoopes, Evergreens, 142.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 373.—Lawson, Pinetum Brit. i, 65, t. 9, f. 1-12 (*P. Fremontiana* on plate).—Watson in King's Rep. v, 330; Pl. Wheeler, 17.—Koch, Dendrologie, ii<sup>2</sup>, 271.—Bertrand in Bull. Soc. Bot. France, xviii, 81, t. 5, f. 81.—Rothrock in Pl. Wheeler, 23, 50.—Vasey, Cat. Forest Trees, 30.—Palmer in Am. Nat. xii, 594.—Engelmann in Wheeler's Rep. vi, 259, 374; Trans. St. Louis Acad. iv, 178; Bot. California, ii, 124.—Sargent in Am. Jour. Sci. 3 ser. xvii, 419.—Masters in London Gard. Chronicle, 1883, p. 48, f. 8.

*P. Fremontiana*, Endlicher, Syn. Conif. 1831, in part.—Gordon in Jour. Hort. Soc. London, iv, 293 & f.; Pinetum, 194; 2 ed. 235.—Knight, Syn. Conif. 28.—Lindley & Gordon in Jour. Hort. Soc. London, v, 216.—Carrière, Trait. Conif. 194; 2 ed. 462.—Henkel & Hochstetter, Nadelhölz. 62.

## PIÑON. NUT PINE.

Near Utah lake, Utah, to the eastern foot-hills of the California sierras, south along the mountain ranges of the Great Basin to the San Francisco mountains of eastern Arizona.

A small, bushy tree, 4 to 6 meters in height, with a trunk sometimes 1 meter in diameter; dry, gravelly slopes and *mesas* between 3,000 and 6,000 feet elevation.

Wood light, soft, weak, brittle, close-grained, compact; bands of small summer cells thin, not conspicuous, resin passages few, not large; medullary rays numerous, obscure; color, yellow or light brown, the sap-wood nearly white; specific gravity, 0.5658; ash, 0.68; largely used for fuel and charcoal.

The large edible seeds furnish the principal food of the Indians of the Great Basin.

357.—*Pinus Balfouriana*, Murray,

Rep. Oregon Exped. i, t. 3, f. 1.—Gordon, Pinetum, 217; 2 ed. 293.—Henkel & Hochstetter, Nadelhölz. 109.—Bolander in Proc. California Acad. iii, 318.—Carrière, Trait. Conif. 2 ed. 425.—Nelson, Pinaceæ, 104.—Hoopees, Evergreens, 149.—Fowler in London Gard. Chronicle, 1872, 973.—Vasey, Cat. Forest Trees, 32.—Engelmann in Trans. St. Louis Acad. iv, 179; Bot. California, ii, 125.—Veitch, Manual Conif. 175.—Lawson, Pinetum Brit. i, 11, f. 1-5.

California, Scott's mountain, Siskiyou county (*Jeffrey, Lemmon*), mount Whitney, and about the headwaters of King and Kern rivers.

A small tree, 15 to 19 meters in height, with a trunk 0.60 to 0.90 meter in diameter; dry, gravelly slopes and ridges, forming upon Scott's mountain a broad belt of open forest growth between 5,000 and 8,000 feet elevation.

Wood light, soft, weak, brittle, very close-grained, compact, satiny, susceptible of a good polish; bands of small summer cells very narrow, dark colored, resin passages few, not conspicuous; medullary rays numerous, obscure; specific gravity, 0.5434; ash, 0.41.

Var. *aristata*, Engelmann,

Wheeler's Rep. vi, 375.—Bot. California, ii, 125.—Veitch, Manual Conif. 175.

*P. aristata*, Engelmann in Am. Jour. Sci. 2 ser. xxxiv, 331; Trans. St. Louis Acad. ii, 205, t. 5, 6; iv, 179; Bot. California, ii, 125.—Parry in Trans. St. Louis Acad. ii, 123.—Wood, Bot. & Fl. 313.—Regel, Gartenflora, 1863, iii, 91.—Henkel & Hochstetter, Nadelhölz. 417.—Nelson, Pinaceæ, 103.—Carrière, Trait. Conif. 2 ed. 424.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 400.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 130.—Murray in London Gard. Chronicle, 1875, 106.—Gordon, Pinetum, 2 ed. 291.—Vasey, Cat. Forest Trees, 32.—Brandege in Coulter's Bot. Gazette, 32.—Lawson, Pinetum Brit. i, 5, f. 1.

*P. Balfouriana*, Watson in King's Rep. v, 331; Pl. Wheeler, 17 [not Murray].—Rothrock in Pl. Wheeler, 28, 50.—Sargent in Am. Jour. Sci. 3 ser. xvii, 419.

FOXTAIL PINE. HICKORY PINE.

Mountains of southeastern California, Nevada, northern Arizona, and southern Utah to Colorado, above 7,500 feet, or in Colorado reaching 12,000 feet elevation.

A tree 15 to 30 meters in height, with a trunk 0.60 to 2.40 meters in diameter; dry, gravelly ridges; not common.

Wood light, soft, not strong, very close-grained, compact; bands of small summer cells thin, dark colored, not conspicuous, resin passages few, not prominent; medullary rays numerous, obscure; color, red, the thin sap-wood nearly white; specific gravity, 0.5572; ash, 0.30; in central Nevada largely used for the timbering of mines, and now nearly exterminated.

358.—*Pinus resinosa*, Aiton,

Hort. Kew. iii, 337; 2 ed. v, 316.—Lambert, Pinus, 1 ed. t. 14; 2 ed. i, 20, t. 14; 3 ed. i, 17, t. 13.—Willdenow, Spec. iv, 496; Enum. 988; Berl. Baumz. 267.—Poiret in Lamarek, Dict. v, 339.—Persoon, Syn. ii, 578.—Desfontaines, Hist. Arb. ii, 612.—Smith in Rees' Cycl. xxviii, No. 37.—Pursh, Fl. Am. Sept. ii, 642.—Eaton, Manual, 110; 6 ed. 264.—Nuttall, Genera, ii, 223.—Hayne, Dend. Fl. 173.—Sprongel, Syst. ii, 886.—Torrey, Compend. Fl. N. States, 360; Fl. N. York, ii, 227.—Beck, Bot. 339.—London, Arboretum, iv, 2210, f. 2094-2097.—Forbes, Pinetum Woburn. 19, t. 6.—Hooker, Fl. Bor.-Am. ii, 161, in part.—Eaton & Wright, Bot. 358.—Bigelow, Fl. Boston. 3 ed. 334.—Lindley in Penn. Cycl. xvii, 170.—Antoine, Conif. 7, t. 4, f. 1.—Link in Linnæa, xv, 501.—Eudlicher, Syn. Conif. 173.—Knight, Syn. Conif. 27.—Lindley & Gordon in Jour. Hort. Soc. London, v, 219.—Parry in Owen's Rep. 618.—Carrière, Trait. Conif. 401.—Gordon, Pinetum, 183 (excl. syn. *Loiseleuriana*); 2 ed. 256.—Richardson Arctic Exped. 441.—Cooper in Smithsonian Rep. 1853, 257.—Wood, Cl. Book, 661; Bot. & Fl. 313.—Henkel & Hochstetter, Nadelhölz. 45 (excl. syn. *Loiseleuriana*).—Hoopees, Evergreens, 102.—Gray, Manual N. States, 5 ed. 470.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 388.—Koeh, Dendrologie, ii<sup>2</sup>, 286.—Vasey, Cat. Forest Trees, 30.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Engelmann in Trans. St. Louis Acad. iv, 179.—Sears in Bull. Essex Inst. xiii, 185.—Bell in Geological Rep. Canada, 1879-'80, 50c.—Veitch, Manual Conif. 159.

*P. rubra*, Michaux f. Hist. Arb. Am. i, 46, t. 1; N. American Sylva, 3 ed. iii, 91, t. 134 [not Lambert].—De Chambray, Trait. Arb. Res. 344.—Gihoul, Arb. Resin. 27.—Carrière, Trait. Conif. 2 ed. 496.

*P. Laricio*, var. *resinosa*, Spach, Hist. Veg. 385.

## RED PINE. NORWAY PINE.

Newfoundland, northern shores of the gulf of Saint Lawrence and lake Nipigon to the valley of the Winnipeg river, south through the northern states to Chestnut Hill, Middlesex county, Massachusetts, the mountains of northern Pennsylvania, Isabella county, Michigan, and central Minnesota.

A large tree, 24 to 46 meters in height, with a trunk 0.60 to 1.37 meter in diameter; light sandy loam or dry rocky ridges, forming scattered groves rarely exceeding a few hundred acres in extent; common and reaching its greatest development through northern Wisconsin and Minnesota; rare in the eastern States, except in the extreme northern portions of New England.

Wood light, not strong, hard, rather coarse-grained, compact; bands of small summer cells broad, dark colored, very resinous, resin passages few, small, not conspicuous; medullary rays numerous, thin; color, light red, the sap-wood yellow or often almost white; specific gravity, 0.4854; ash, 0.27; largely manufactured into lumber and used for all purposes of construction, flooring, piles, etc.

359.—*Pinus Torreyana*, Parry,

Bot. Mex. Boundary Survey, 210, t. 58, 59; Proc. San Diego Nat. Hist. Soc. Nov. 1883.—Carrière, Trait. Conif. 326; 2 ed. 423.—Gordon, Pinetum, 241.—Cooper in Smithsonian Rep. 1860, 442.—Henkel & Hochstetter, Nadelhölz. 117.—Bolander in Proc. California Acad. iii, 318.—Hoopes, Evergreens, 150.—Vasey, Cat. Forest Trees, 31.—Palmer in Am. Nat. xii, 594.—Engelmann in Trans. St. Louis Acad. iv, 181; Bot. California, ii, 125.—Veitch, Manual Conif. 173.

*P. lophosperma*, Lindley in London Gard. Chronicle, 1860, 46.—Gordon, Pinetum, Suppl. 69; 2 ed. 310.—Henkel & Hochstetter, Nadelhölz. 112.—Nelson, Pinaceæ, 117.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 391.

California, mouth of the Soledad river, San Diego county; doubtfully reported from one of the islands of Santa Barbara and from Lower California.

A low, short-lived, gnarled, crooked tree, 6 to 8 meters in height, with a trunk 0.23 to 0.33 meter in diameter crests of sandy bluffs immediately upon the sea-coast; very local and fast disappearing.

Wood light, soft, not strong, brittle, rather close-grained, compact; bands of small summer cells broad resinous, conspicuous, resin passages small, few; medullary rays numerous, obscure; color, light red, the sap-wood yellow or nearly white; specific gravity, 0.4879; ash, 0.35; locally used for fuel.

360.—*Pinus Arizonica*, Engelmann,

Wheeler's Rep. vi, 260; Trans. St. Louis Acad. iv, 181; Coulter's Bot. Gazette, vii, 4.

## YELLOW PINE.

Santa Rita mountains (*Rothrock, Engelmann & Sargent*), Santa Catalina mountains (*Lemmon, Pringle*), and probably upon other ranges of southern Arizona.

A tree 24 to 30 meters in height, with a trunk 0.60 to 0.90 meter in diameter; high rocky ridges between 6,000 and 8,000 feet elevation; the prevailing forest tree over large areas near the summits of the Santa Catalina mountains (*Lemmon*).

Wood light, soft, not strong, rather brittle, close-grained, compact; bands of small summer cells broad, very resinous, conspicuous, resin passages numerous, large; medullary rays thin, obscure; color, light red or often yellow, the sap-wood lighter yellow or white; specific gravity, 0.5038; ash, 0.20; sometimes sawed into inferior lumber.

361.—*Pinus ponderosa*, Douglas,

Companion Bot. Mag. ii, 111.—London, Arboretum, iv, 2243, f. 2132-2136.—Forbes, Pinetum Woburn. 44, t. 15.—Antoine, Conif. 28, t. 8 f. 1.—Lindley in Penn. Cycl. xvii, 172.—Link in Linnæa, xv, 306.—Nuttall, Sylva, iii, 114; 2 ed. ii, 173.—Spach, Hist. Veg. xi, 389.—Endlicher, Syn. Conif. 163.—Knight, Syn. Conif. 30.—Lindley & Gordon in Jour. Hort. Soc. London, v, 217.—Carrière, Trait. Conif. 340; 2 ed. 445.—Gordon, Pinetum, 205; Suppl. 67; 2 ed. 281.—Newberry in Pacific R. R. Rep. vi, 36, 90, t. 4, f. 12.—Cooper in Smithsonian Rep. 1858, 261; Pacific R. R. Rep. xii<sup>2</sup>, 27, 68; Am. Nat. iii, 409.—Torrey, Bot. Mex. Boundary Survey, 209; Ives' Rep. 28.—Engelmann in Am. Jour. Sci. 2 ser. xxxiv, 332; Proc. Am. Phil. Soc. 2 ser. xii, 209; Wheeler's Rep. vi, 261; Trans. St. Louis Acad. iv, 181; Bot. California, ii, 125.—Lyll in Jour. Linnæan Soc. vii, 142.—Bolander in Proc. California Acad. iii, 226, 317.—Henkel & Hochstetter, Nadelhölz. 71.—Nelson, Pinaceæ, 125.—Hoopes, Evergreens, 117.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 391 (excl. syn. *Sinclairii*).—Watson in King's Rep. v, 331; Pl. Wheeler, 17.—Gray in Proc. Am. Acad. vii, 402.—Fowler in London Gard. Chronicle, 1872, 1326.—Koch, Dendrologie, ii<sup>2</sup>, 310.—Rothrock in Pl. Wheeler, 28, 50; Wheeler's Rep. vi, 9.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 129.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 121.—Vasey, Cat. Forest Trees, 30.—Hall in Coulter's Bot. Gazette, ii, 91.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Brandege in Coulter's Bot. Gazette, iii, 32.—G. M. Dawson in Canadian Nat. new ser. ix, 326.—Rusby in Bull. Torrey Bot. Club, ix, 106.

- P. Benthamiana*, Hartweg in Jour. Hort. Soc. London, ii, 189; iii, 223.—Gordon in Jour. Hort. Soc. London, iv, 212 & t.; (Fl. des Serres, vi, 85 & f.); Pinetum, 188; 2 ed. 261 (excl. syn. *Sinclairii*).—Knight, Syn. Conif. 30.—Lindley & Gordon in Jour. Hort. Soc. London, v, 216.—Carrière, Trait. Conif. 350; 2 ed. 452.—Murray in Edinburgh New Phil. Jour. new ser. i, 287, t. 8.—Henkel & Hochstetter, Nadelhölz. 84.—Nelson, Pinaceæ, 104.—Fowler in London Gard. Chronicle, 1872, 973.
- P. resinosa*, Torrey in Ann. Lyc. N. York, ii, 249 [not Aiton].—Douglas, Companion Bot. Mag. ii, 126.—Hooker, Fl. Bor.-Am. ii, 161, in part.—Winchell in Ludlow's Rep. Black Hills, 68.
- P. brachyptera*, Engelmann in Wislizenus' Rep. No. 4.—Lindley & Gordon in Jour. Hort. Soc. London, v, 216.—Carrière in Fl. des Serres, ix, 201; Rev. Hort. 1854, 227; Trait. Conif. 356; 2 ed. 454.—Bigelow in Pacific R. R. Rep. iv 18.—Gordon, Pinetum, 190; 2 ed. 263.—Henkel & Hochstetter, Nadelhölz. 85.—Nelson, Pinaceæ, 454.
- P. Beardsleyi*, Murray in Edinburgh New Phil. Jour. new ser. i, 286, t. 6.—Carrière, Trait. Conif. 359.
- P. Craigana*, Murray in Edinburgh New Phil. Jour. new ser. i, 288, t. 7.
- P. macrophylla*, ? Torrey in Sitgreaves' Rep. 173 [not Engelmann].
- P. Engelmanni*, Torrey in Pacific R. R. Rep. iv, 141 [not Carrière].
- P. Parryana*, Gordon, Pinetum, 202; 2 ed. 277 [not Engelmann].—Henkel & Hochstetter, Nadelhölz. 88.—Carrière, Trait. Conif. 2 ed. 446.
- P. ponderosa*, var. *Benthamiana*, Vasey, Cat. Forest Trees, 30.
- P. ponderosa*, var. *scopulorum*, Engelmann in Bot. California, ii, 126.

## YELLOW PINE. BULL PINE.

Interior of British Columbia, south of latitude 51°, south and east along the mountain ranges of the Pacific region to Mexico, the Black hills of Dakota, Colorado, and western Texas; not detected in central or southern Nevada.

A large tree, 61 to 91 meters in height, with a trunk 3.60 to 4.57 meters in diameter, or throughout the Rocky Mountain region much smaller, rarely exceeding 30 meters in height (var. *scopulorum*); dry, rocky ridges and prairies, or in northern California rarely in cold, wet swamps, reaching its greatest development along the western slope of the sierras of northern and central California; in western Washington territory and Oregon rare and local; after *Pseudotsuga Douglasii* the most generally distributed and valuable timber tree of the Pacific forests, furnishing the principal lumber of eastern Washington territory and Oregon, western Montana, Idaho, the Black hills of Dakota, western Texas, New Mexico, and Arizona.

Wood, varying greatly in quality and value, heavy, hard, strong, brittle, not coarse-grained nor durable, compact; bands of small summer cells broad or narrow, very resinous, conspicuous, resin passages few, small; medullary rays numerous, obscure; color, light red, the very thick sap-wood almost white; specific gravity, 0.4715; ash, 0.35; largely manufactured into lumber, and used for railway ties, fuel, etc.

NOTE.—A form with purple cones and long glaucous foliage, approaching *P. Jeffreyi* in habit, is the prevailing tree of the valley of Flathead lake, Montana (*Canby & Sargent*).

362.—*Pinus Jeffreyi*, Murray,

Rep. Oregon Exped. 2, t. 1; Edinburgh New Phil. Jour. new ser. xi, 224, t. 8, 9 (Trans. Bot. Soc. Edinburgh, vi, 350 & t.); Carrière, Trait. Conif. 388; 2 ed. 439.—Gordon, Pinetum, 198; 2 ed. 272.—Henkel & Hochstetter, Nadelhölz. 87.—Nelson, Pinaceæ, 115.—Hoopes, Evergreens, 115.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 393.—Lawson, Pinetum Brit. i, 45, t. 6, f. 1-4.—Koch, Dendrologie, ii<sup>2</sup>, 314.—Engelmann in Coulter's Bot. Gazette, vii, 4.—Veitch, Manual Conif. 165.

*P. deflexa*, Torrey in Bot. Mex. Boundary Survey, 209, t. 56, in part.—Cooper in Smithsonian Rep. 1860, 442.—Henkel & Hochstetter, Nadelhölz. 416.—Carrière, Trait. Conif. 2 ed. 455.—Bolander in Proc. California Acad. iii, 318.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 431.—Fowler in London Gard. Chronicle, 1872, 1070.—Murray in London Gard. Chronicle, 1875, 106.—Gordon, Pinetum, 2 ed. 239.

*P. ponderosa*, var. *Jeffreyi*, Vasey, Cat. Forest Trees, 31.—Engelmann in Trans. St. Louis Acad. iv, 181; Bot. California, ii, 126.

## BULL PINE. BLACK PINE.

California, Scott's mountain, Siskiyou county, south along the Sierra Nevada to the San Bernardino and San Jacinto mountains.

A large tree, 30 to 31 meters in height, with a trunk 1.20 to 4 meters in diameter; dry, gravelly slopes between 6,000 and 8,000 feet elevation; most common and reaching its greatest development on the eastern slope of the Sierra Nevadas, here generally replacing the allied *P. ponderosa*, from which it may be distinguished by its more deeply-cleft bark, glaucous branchlets and leaves, much larger cones, and by the strong, pungent odor of oil of orange of the freshly-cut branchlets.

Wood light, strong, hard, rather coarse-grained, compact; bands of small summer cells not broad, very resinous, conspicuous, resin passages few, not large; medullary rays numerous, obscure; color, light red, the sap-wood pale yellow or nearly white; specific gravity, 0.5206; ash, 0.26; largely manufactured into coarse lumber.

*Abietine*, a volatile carbo-hydrogen possessing powerful anæsthetic properties, is probably obtained by distilling the resinous exudation of this species, and not of *P. Sabiniana* (*Watt's Dict. Chemistry*, 2d Suppl. 1.—*Am. Jour. Pharm.* 1872, 97.—*U. S. Dispensatory*, 14 ed. 900).

### 363.—*Pinus Chihuahuana*, Engelm.

Wislizenus' Rep. No. 26; Wheeler's Rep. vi, 262; Trans. St. Louis Acad. iv, 181; Coulter's Bot. Gazette, vii, 4.—Lindley & Gordon in Jour. Hort. Soc. London, v, 220.—Carrière in Fl. des Serres, ix, 200; Rev. Hort. 1854, 227; Trait. Conif. 357; 2 ed. 455.—Gordon, Pinetum, 193; 2 ed. 266.—Torrey, Bot. Mex. Boundary Survey, 209.—Cooper in Smithsonian Rep. 1860, 442.—Henkel & Hochstetter, Nadelhölz. 86.—Hoopes, Evergreens, 143.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 397.—Vasey, Cat. Forest Trees, 32.

Santa Rita mountains, Arizona (*Rothrock*, *Engelmann & Sargent*), San Francisco mountains of southwestern New Mexico and Arizona (*Greene*); in Chihuahua.

A small tree, 18 to 24 meters in height, with a trunk 0.45 to 0.60 meter in diameter; dry, rocky ridges and slopes between 5,000 and 7,000 feet elevation; not common.

Wood light, soft, strong, brittle, close-grained, compact; bands of small summer cells not broad, resinous, conspicuous, resin passages few, rather large, conspicuous; medullary rays numerous, thin; color, clear light orange, the thick sap-wood lighter; specific gravity, 0.5457; ash, 0.39.

### 364.—*Pinus contorta*, Douglas;

London, Arboretum, iv, 2292, f. 2210, 2211.—Nuttall, Sylva, iii, 117; 2 ed. ii, 176.—Endlicher, Syn. Conif. 168.—Carrière, Trait. Conif. 164; 2 ed. 474.—Torrey in Pacific R. R. Rep. iv, 141.—Gordon, Pinetum, 165; 2 ed. 232.—Cooper in Smithsonian Rep. 1858, 261.—Lyll in Jour. Linnæan Soc. vii, 133, 141, in part.—Henkel & Hochstetter, Nadelhölz. 24.—Rothrock in Smithsonian Rep. 1867, 433.—Hoopes, Evergreens, 81, in part.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 381, in part.—Watson in King's Rep. v, 330.—Fowler in London Gard. Chronicle, 1872, 1070.—Gray in Proc. Am. Acad. vii, 402.—Koch, Dendrologie, ii<sup>2</sup>, 301.—Vasey, Cat. Forest Trees, 29.—Hall in Coulter's Bot. Gazette, ii, 91.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Engelmann in Trans. St. Louis Acad. iv, 182; Bot. California, ii, 126; London Gard. Chronicle, 1883, 351.—G. M. Dawson in Canadian Nat. 2 ser. ix, 327, in part.—Veitch, Manual Conif. 145.—Masters in London Gard. Chronicle, 1883, 45, f. 5.

*P. inops*, Bongard in Mem. Acad. St. Petersburg, 6 ser. ii, 163 [not Aiton].—Hooker, Fl. Bor.-Am. ii, 161, in part.—Ledebour, Fl. Rossica, iii, 676 [not Aiton].

*P. Boursieri*, Carrière in Rev. Hort. 1854, 233 & f.; Fl. des Serres, ix, 200 & f.; Trait. Conif. 398; 2 ed. 475.

*P. Banksiana*, Lindley & Gordon in Jour. Hort. Soc. London, v, 218, in part.

*P. muricata*, Bolander in Proc. California Acad. iii, 227, 317 [not Don].

*P. Bolanderi*, Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 379.

### SCRUB PINE.

Alaska, south along the coast to Mendocino county, California, extending inland to the western slopes of the Coast ranges.

A small, stunted tree, 6 to 9 meters in height, with a trunk 0.30 to 0.50 meter in diameter; sandy dunes and exposed rocky points.

Wood light, hard, strong, brittle, coarse-grained; bands of small summer cells very broad, resinous, conspicuous, resin passages numerous, not large; medullary rays numerous, obscure; color, light brown tinged with red, the thick sap-wood nearly white; specific gravity, 0.5815; ash, 0.19.

### 365.—*Pinus Murrayana*, Balfour,

Rep. Oregon Exped. 2, t. 3, f. 2.—Murray in Edinburgh New Phil. Jour. new ser. xi, 226 (Trans. Bot. Soc. Edinburgh, vi, 351).

*P. inops*, Bentham, Fl. Hartweg. 337 [not Aiton].

*P. contorta*, Newberry in Pacific R. R. Rep. vi, 34, 90, t. 5, f. 11 [not Douglas].—Engelmann in Am. Jour. Sci. 2. ser. xxiv, 332.—Lyll in Jour. Linnæan Soc. vii, 141, in part.—Cooper in Am. Nat. iii, 409.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 381, in part.—Porter in Hayden's Rep. 1871, 494.—Gray in Proc. Am. Acad. vii, 402.—Rothrock in Fl. Wheeler, 27, 50.—Parry in Am. Nat. vii, 179.

*P. contorta*, var. *latifolia*, Engelmann in King's Rep. v, 331; Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 129; Wheeler's Rep. vi, 262.—Brandege in Coulter's Bot. Gazette, iii, 32.—G. M. Dawson in Canadian Nat. new ser. ix, 328.

*P. contorta*, var. *Bolanderi*, Vasey, Cat. Forest Trees, 29.

## TAMARACK. BLACK PINE. LODGE-POLE PINE. SPRUCE PINE.

Valley of the Yukon river, Alaska (Fort Selkirk, *Dall*), south through the interior of British Columbia, along the mountain ranges of Washington territory and Oregon and the Sierra Nevadas of California to mount San Jacinto; on the high plateau east of the Rocky mountains in about latitude 56°, and south through the mountains of Idaho, Montana, Wyoming, Colorado, and Utah to New Mexico and northern Arizona.

A tree 18 to 24 meters in height, with a trunk 0.60 to 1.20 meter in diameter; reaching its greatest development in the California Sierras; in the interior regions in dry, gravelly soil, here the prevailing tree, covering immense areas, and generally replacing other species destroyed by fire; western Washington territory and southward only along the borders of moist alpine meadows between 6,000 and 9,000 feet elevation; generally confounded with the closely-allied *P. contorta* of the coast, from which it may be distinguished by its longer, broader leaves, very thin, scaly bark, thin sap-wood, and less resinous and finer-grained wood, resembling that of the white pines; the distribution of the two species in northern British Columbia and Alaska still undetermined.

Wood light, soft, not strong, close, straight-grained, easily worked, compact, not durable; bands of small summer cells narrow, not conspicuous, resin passages few, not large; medullary rays numerous, obscure; color, light yellow or nearly white, the thin sap-wood lighter; specific gravity, 0.4096; ash, 0.32; occasionally manufactured into lumber, and used for fuel, railway ties, etc.

366.—*Pinus Sabiniana*, Douglas,

Companion Bot. Mag. ii, 150.—Lambert, *Pinus*, 1 ed. iii, 137, t. 58.—London, *Arboretum*, iv, 2246, f. 2138-2143.—Forbes, *Pinetum Woburn*, 63, t. 23, 24.—Hooker, *Fl. Bor.-Am.* ii, 162.—Lindley in *Penn. Cycl.* xvii, 172.—Antoine, *Conif.* 30, t. 11.—Hooker & Arnott, *Bot. Beechey*, 393.—Link in *Linnaea*, xv, 509.—Nuttall, *Sylva*, iii, 110, t. 113; 2 ed. ii, 169, t. 113.—Spach, *Hist. Veg.* xi, 390.—De Chambray, *Trait. Arb. Res.* 347.—Endlicher, *Syn. Conif.* 159.—Knight, *Syn. Conif.* 30.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 216.—*Fl. des Serres*, ix, 275, t. 964.—Carrière, *Trait. Conif.* 334; 2 ed. 435.—Torrey & Gray in *Pacific R. R. Rep.* ii, 130.—Bigelow in *Pacific R. R. Rep.* iv, 25.—Torrey in *Pacific R. R. Rep.* iv, 141; *Bot. Mex. Boundary Survey*, 210; t. 57; *Ives' Rep.* 28.—Newberry in *Pacific R. R. Rep.* vi, 39, 90, f. 13.—Gordon, *Pinetum*, 208; 2 ed. 284.—Cooper in *Smithsonian Rep.* 1858, 261.—Walpers, *Ann.* v, 799.—Bolander in *Proc. California Acad.* iii, 226, 318.—Henkel & Hochstetter, *Nadelhölz.* 75.—Lawson, *Pinetum Brit.* i, 85, t. 11, t. 1-3.—Nelson, *Pinaceae*, 129.—Hoopes, *Evergreens*, 121.—Parlatore in *De Candolle, Prodr.* xvi<sup>2</sup>, 391.—Fowler in *London Gard. Chronicle*, 1872, 1323.—Koch, *Dendrologie*, ii<sup>2</sup>, 312.—Vasey, *Cat. Forest Trees*, 31.—Engelmann in *Wheeler's Rep.* vi, 375; *Trans. St. Louis Acad.* iv, 182; *Bot. California*, ii, 127.—Veitch, *Manual Conif.* 169.

## DIGGER PINE. BULL PINE.

California, Portuguese Flat, Shasta county, south along the foot-hills of the Coast ranges and the western slope of the Sierra Nevadas below 4,000 feet elevation.

A large tree, 24 to 30 meters in height, with a trunk 0.60 to 1.20 meter in diameter; very common through all the foot-hills region.

Wood light, soft, not strong, brittle, very coarse-grained, compact, not durable; bands of small summer cells broad, very resinous, conspicuous, resin passages few, large, prominent; medullary rays numerous, obscure; color, light brown or red, the thick sap-wood yellow or nearly white; specific gravity, 0.4840; ash, 0.40; largely used for fuel.

The large edible nuts furnish the Indians an important article of food.

367.—*Pinus Coulteri*, D. Don,

*Trans. Linnæan Soc.* xvii, 440.—London, *Arboretum*, iv, 2250, f. 2144-2146.—Forbes, *Pinetum Woburn*, 67, t. 25, 26.—Antoine, *Conif.* 31, t. 12, 13.—*Penn. Cycl.* xvii, 172.—Link in *Linnaea*, xv, 510.—Hooker & Arnott, *Bot. Beechey*, 393.—Nuttall, *Sylva*, iii, 112; 2 ed. ii, 171.—Endlicher, *Syn. Conif.* 160.—Carrière in *Fl. des Serres*, ix, 275 & t.; *Trait. Conif.* 334; 2 ed. 435.—Cooper in *Smithsonian Rep.* 1858, 261.—Torrey in *Ives' Rep.* 28.—Henkel & Hochstetter, *Nadelhölz.* 76.—Bolander in *Proc. California Acad.* iii, 318.—Parlatore in *De Candolle, Prodr.* xvi, 392.—Vasey, *Cat. Forest Trees*, 31.—Gordon, *Pinetum*, 2 ed. 266.—Engelmann in *Trans. St. Louis Acad.* iv, 182; *Bot. California*, ii, 127.—Lawson, *Pinetum Brit.* i, 23, f. 1-5.

*P. macrocarpa*, Lindley in *Bot. Reg.* xxvi, Misc. 61.—Knight, *Syn. Conif.* 30.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 216.—Gordon, *Pinetum*, 201.—Nelson, *Pinaceae*, 117.—Hoopes, *Evergreens*, 115.—Veitch, *Manual Conif.* 166.

*P. Sabiniana Coulteri*, London, *Encycl. Pl.* 935, f. 1839-1841.

*P. Sabiniana macrocarpa*, Hort.

California, Monte Diablo, south through the Coast ranges to the Cuyamaca mountains, and probably in Lower California.

A tree 24 to 46 meters in height, with a trunk 0.90 to 1.80 meter in diameter; dry ridges and slopes between 3,000 and 6,000 feet elevation; most common and reaching its greatest development in the San Jacinto mountains.

Wood light, soft, not strong, brittle, coarse-grained; bands of small summer cells broad, very resinous, conspicuous, resin passages few, large; medullary rays numerous, prominent; color, light red, the thick sap-wood nearly white; specific gravity, 0.4133; ash, 0.37.

368.—*Pinus insignis*, Douglas;

London, Arboretum, iv, 2243, f. 2132-2137.—Forbes, Pinetum Woburn. 51, t. 18.—Lindley in Penn. Cycl. xvii, 171.—Antoine, Conif. 27, t. 8, f. 1.—Hooker & Arnott, Bot. Beechey, 393.—Spach, Hist. Veg. xi, 389.—Nuttall, Sylva, iii, 115; 2 ed. ii, 174.—Bentham, Bot. Sulphur, 55.—Endlicher, Syn. Conif. 163.—Knight, Syn. Conif. 30.—Lindley & Gordon in Jour. Hort. Soc. London, v, 217.—Carrière, Trait. Conif. 339; 2 ed. 440.—Bigelow in Pacific R. R. Rep. iv, 25.—Torrey in Pacific R. R. Rep. iv, 141; Bot. Mex. Boundary Survey, 209, t. 55; Ives' Rep. 23.—Newberry in Pacific R. R. Rep. vi, 90.—Gordon, Pinetum, 197; 2 ed. 270.—Cooper in Smithsonian Rep. 1858, 261.—Murray in Edinburgh New Phil. Jour. new ser. xi, 222 (Trans. Bot. Soc. Edinburgh, vi, 347).—Henkel & Hochstetter, Nadelhölz. 69.—Bolander in Proc. California Acad. iii, 262, t. 317.—Nelson, Pinaceæ, 114.—Hoopes, Evergreens, 143.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 395.—Lawson, Pinetum Brit. i, 37 t. 1, 5, f. 1-14.—Fowler in London Gard. Chronicle, 1872, 1070.—Vasey, Cat. Forest Trees, 31.—Engelmann in Trans. St. Louis Acad. iv, 182; Bot. California, ii, 128.—Voitch, Manual Conif. 163, f. 39.

?*P. Californica*, Loiseleur in Nouveau Duhamel, v, 243.—London, Arboretum, iv, 2268.—Endlicher, Syn. Conif. 162.—Hooker & Arnott, Bot. Beechey, 393.—Nuttall, Sylva, iii, 117; 2 ed. ii, 175.—Carrière, Trait. Conif. 1 ed. 253.

*P. adunca*, Bose in Poiret, Suppl. iv, 418.

*P. Sinclairii*, Hooker & Arnott, Bot. Beechey, 392, 393, t. 93, in part.—Nuttall, Sylva, iii, 141; 2 ed. ii, 198.—Carrière, Trait. Conif. 2 ed. ii, 198.

*P. radiata*, D. Don in Trans. Linnæan Soc. xvii, 442; Lambert, Pinus, 1 ed. iii, 133, t. 86.—London, Arboretum, iv, 2270, f. 2182.—Antoine, Conif. 33, t. 14, f. 3.—Hooker & Arnott, Bot. Beechey, 392, 393, in part.—Nuttall, Sylva, iii, 116; 2 ed. ii, 175.—Endlicher, Syn. Conif. 161.—Hartweg in Jour. Hort. Soc. London, iii, 226.—Gordon in Jour. Hort. Soc. London, iv, 214 & f. (Fl. des Serres, vi, 434 & t.); Pinetum, 206; 2 ed. 282.—Knight, Syn. Conif. 37.—Lindley & Gordon in Jour. Hort. Soc. London, v, 216.—Carrière, Trait. Conif. 1 ed. 337.—Nelson, Pinaceæ, 127.—Hoopes, Evergreens, 118.—Koch, Dendrologie, ii<sup>2</sup>, 307.—Vasey, Cat. Forest Trees, 31.

*P. tuberculata*, D. Don in Trans. Linnæan Soc. xvii, 441 [not Gordon].—Lambert, Pinus, 1 ed. iii, 131, t. 85.—London, Arboretum, iv, 2270, f. 2181.—Antoine, Conif. 33, t. 14, f. 2.—Hooker & Arnott, Bot. Beechey, 394.—Endlicher, syn. Conif. 162.—Carrière, Trait. Conif. 338; 2 ed. 441, in part.—Nelson, Pinaceæ, 137.—Hoopes, Evergreens, 123 (excl. syn. *Californica*).—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 394, in part.

*P. rigida*,? Hooker & Arnott, Bot. Beechey, 160 [not Miller].

*P. insignis macrocarpa*, Hartweg in Jour. Hort. Soc. London, iii, 226.—Carrière, Trait. Conif. 440.

## MONTEREY PINE.

California, Pescadero to Monterey and San Simeon bay.

A tree 24 to 30 meters in height, with a trunk 0.60 to 0.90 meter in diameter; sandy soil, in immediate proximity to the sea-coast; rare and local; now widely cultivated on the Pacific coast for shelter and ornament. A form of Guadalupe island, off the coast of Lower California, with leaves in pairs, is var. *binata* (Engelmann in Proc. Am. Acad. xi, 119; Bot. California, ii, 128).

Wood light, soft, not strong, brittle, close-grained, compact; bands of small summer cells not broad, resinous, conspicuous; color, light brown, the very thick sap-wood nearly white; specific gravity, 0.4574; ash, 0.30; locally somewhat used for fuel.

369.—*Pinus tuberculata*, Gordon,

Jour. Hort. Soc. London, iv, 218 & f. (Fl. des Serres, v, 517<sup>c</sup> & f.); Pinetum, 211; 2 ed. 288 [not Don].—Rep. Oregon Exped. 2, t. 2, f. 2.—Henkel & Hochstetter, Nadelhölz. 73, in part.—Bolander in Proc. California Acad. iii, 262, 317.—Lawson, Pinetum Brit. i, 93, t. 13, f. 1-9.—Carrière, Trait. Conif. 2 ed. 441, in part.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 394 (excl. bib.).—Koch, Dendrologie, ii<sup>2</sup>, 309.—Vasey, Cat. Forest Trees, 31.—Engelmann in Trans. St. Louis Acad. iv, 183; Bot. California, ii, 128.—Voitch, Manual Conif. 170.

*P. Californica*, Hartweg in Jour. Hort. Soc. London, ii, 189 [not Loiseleur].

## KNOB-CONE PINE.

Valley of the Mackenzie river, Oregon, south along the western slope of the Cascade and Sierra Nevada mountains, and in the California Coast ranges from the Santa Cruz to the San Jacinto mountains.

A tree 18 to 22 meters in height, with a trunk 0.60 to 0.90 meter in diameter, or, rarely, reduced to a low shrub, fruiting when not more than 1 meter in height; dry, gravelly ridges and slopes from 2,500 (San Bernardino mountains) to 5,500 (mount Shasta) feet elevation; not common.

Wood light, soft, not strong, brittle, coarse-grained, compact; bands of small summer cells very broad, not conspicuous, resin passages numerous, large, prominent; medullary rays numerous, thin; color, light brown, the thick sap-wood nearly white or slightly tinged with red; specific gravity, 0.3499; ash, 0.33.

370.—*Pinus Tæda*, Linnæus,

Spec. 1 ed. 1000, in part.—Du Roi, Harbk. ii, 63.—Wangenheim, Amer. 41.—Aiton, Hort. Kew. iii, 368; 2 ed. v, 317.—Moench, Meth. 365.—Michaux, Fl. Bor.-Am. ii, 205.—Lambert, Pinus, 1 ed. i, 23, t. 16, 17; 2 ed. i, 26, t. 17, 18; 3 ed. i, 30, t. 15.—Willdenow, Spec. iv, 498; Berl. Baumz. 269.—Persoon, Syn. ii, 578.—Desfontaines, Hist. Arb. ii, 612.—Michaux f. Hist. Arb. Am. i, 98, t. 9; N. American Sylva, 3 ed. iii, 123, t. 143.—Nouveau Duhamel, v, 245, t. 75, f. 2.—Smith in Rees' Cycl. xxviii, No. 13.—Pursh, Fl. Am. Sept. ii, 644.—Nuttall, Genera, ii, 223.—Hayne, Dend. Fl. 175.—Elliott, Sk. ii, 636.—Sprengel, Syst. ii, 887.—Eaton, Manual, 6 ed. 265.—Lawson, Ag. Manual, 351; Pinetum Brit. i, 89, t. 12.—London, Arboretum, iv, 2237, f. 2118-2122.—Forbes, Pinetum Woburn. 43, t. 14.—Antoine, Conif. 25, t. 7, f. 1.—Eaton & Wright, Bot. 359.—Link in Linnæa, xv, 503.—Spach, Hist. Veg. xi, 391.—Griffith, Med. Bot. 609.—Gihoul, Arb. Resin, 32.—Endlicher, Syn. Conif. 164.—Scheele in Rœmer, Texas, Appx. 447.—Knight, Syn. Conif. 30.—Lindley & Gordon in Jour. Hort. Soc. London, v, 217.—Carrière, Trait. Conif. 344; 2 ed. 448.—Darby, Bot. S. States, 515.—Gordon, Pinetum, 210; 2 ed. 286.—Cooper in Smithsonian Rep. 1853, 257.—Chapman, Fl. S. States, 433.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 22.—Lesquereux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 660; Bot. & Fl. 313.—Porcher, Resources S. Forests, 506.—Henkel & Hochstetter, Nadelhölz. 65.—Nelson, Pinaceæ, 136.—Gray, Manual N. States, 5 ed. 469; Hall's Pl. Texas, 21.—Hoopes, Evergreens, 122.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 393.—Young, Bot. Texas, 516.—Koch, Dendrologie, ii<sup>2</sup>, 304.—Vasey, Cat. Forest Trees, 31.—Bentley & Trimen, Med. Pl. iv, 259, t. 259.—Engelmann in Trans. St. Louis Acad. iv, 183.—Veitch, Manual Conif. 172.

*P. Tæda*, var. *tenuifolia*, Aiton, Hort. Kew. iii, 368.

## LOBLOLLY PINE. OLD-FIELD PINE. ROSEMARY PINE.

Southern Delaware, south to cape Malabar and Tampa bay, Florida, generally near the coast, through the Gulf states to the valley of the Colorado river, Texas, and north through southern Arkansas to the valley of the Arkansas river.

A tree 24 to 46 meters in height, with a trunk 0.90 to 1.50 meter in diameter; low, wet clay or dry sandy soil; springing up on all abandoned lands from Virginia southward, and now often replacing in the southern pine belt the original forests of *Pinus palustris*; in eastern North Carolina rarely on low, rich swamp ridges, here known as rosemary pine and attaining its greatest development and value.

Wood light, not strong, brittle, very coarse-grained, not durable; bands of small summer cells broad, very resinous, conspicuous, resin passages few, not prominent; medullary rays numerous, obscure; color, light brown, the very thick sap-wood orange, or often nearly white; wood of the rosemary pine close-grained, less resinous, lighter, with much thinner sap; specific gravity, 0.5441; ash, 0.26; largely used for fuel and manufactured into lumber of inferior quality.

Turpentine is occasionally manufactured from this species (*U. S. Dispensatory*, 14 ed. 901.—*Flückiger & Hanbury, Pharmacographia*, 545).

371.—*Pinus rigida*, Miller,

Dict. 7 ed. No. 10.—Du Roi, Harbk. ii, 60.—Marshall, Arbustum, 101.—Wangenheim, Amer. 41.—Lambert, Pinus, 1 ed. i, 25, t. 18, 19; 2 ed. i, 28; t. 18, 19; 3 ed. i, 32, t. 16, 17.—Willdenow, Spec. iv, 498; Enum. 988; Berl. Baumz. 268.—Persoon, Syn. ii, 578.—Desfontaines, Hist. Arb. ii, 612.—Michaux f. Hist. Arb. Am. i, 89, t. 8; N. American Sylva, 3 ed. iii, 118, t. 144.—Nouveau Duhamel, v, 244, t. 74.—Aiton, Hort. Kew. 2 ed. v, 317.—Smith in Rees' Cycl. xxviii, No. 14.—Pursh, Fl. Am. Sept. ii, 643.—Poiret, Suppl. iv, 417.—Eaton, Manual, 110; 6 ed. 265.—Barton, Compend. Fl. Philadelph. ii, 183.—Nuttall, Genera, ii, 223.—Hayne, Dend. Fl. 175.—Elliott, Sk. ii, 635.—Sprengel, Syst. ii, 887.—Torrey, Compend. Fl. N. States, 360; Fl. N. York, ii, 227.—Beck, Bot. 339.—London, Arboretum, iv, 2239, f. 2123-2126.—Forbes, Pinetum Woburn. 41, t. 13.—Eaton & Wright, Bot. 358.—Antoine, Conif. 26, t. 7, f. 2.—Bigelow, Fl. Boston. 3 ed. 385.—Lindley in Penn. Cycl. xvii, 172.—Link in Linnæa, xv, 503.—Spach, Hist. Veg. xi, 388.—Griffith, Med. Bot. 604.—Gihoul, Arb. Resin, 31.—Endlicher, Syn. Conif. 164.—Knight, Syn. Conif. 30.—Lindley & Gordon in Jour. Hort. Soc. London, v, 217.—Carrière, Trait. Conif. 342; 2 ed. 447.—Darlington, Fl. Cestræa, 3 ed. 290.—Darby, Bot. S. States, 514.—Gordon, Pinetum, 207; 2 ed. 283.—Cooper in Smithsonian Rep. 1853, 257.—Chapman, Fl. S. States, 433.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 21.—Wood, Cl. Book, 660; Bot. & Fl. 313.—Henkel & Hochstetter, Nadelhölz, 67.—Nelson, Pinaceæ, 128.—Gray, Manual N. States, 5 ed. 469.—Hoopes, Evergreens, 119.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 394.—Koch, Dendrologie, ii<sup>2</sup>, 307.—Vasey, Cat. Forest Trees, 31.—Engelmann in Trans. St. Louis Acad. iv, 183.—Sears in Bull. Essex Inst. xiii, 126.—Veitch, Manual Conif. 169.

*P. Tæda*, var. *rigida*, Aiton, Hort. Kew. iii, 368.

*P. Tæda*, var. *a.* Poiret in Lamarck, Dict. v, 340.

*P. Fraseri*, Loddiges, Cat. ed. 1836, 50 [not Pursh].

*P. Loddigesii*, London, Arboretum, iv, 2269.

## PITCH PINE.

Valley of the Saint John's river, New Brunswick, to the northern shores of lake Ontario, south through the Atlantic states to northern Georgia, extending to the western slope of the Alleghany mountains in West Virginia and Kentucky (Pineville, Bell county, *De Friese*).

A tree 12 to 24 meters in height, with a trunk 0.60 to 0.90 meter in diameter; dry, sandy, barren soil, or less commonly in deep, cold swamps; very common.

Wood light, soft, not strong, brittle, coarse-grained, compact; bands of small summer cells broad, very resinous, conspicuous, resin passages numerous, not large; medullary rays numerous, obscure; color, light brown or red, the thick sap-wood yellow or often nearly white; specific gravity, 0.5151; ash, 0.23; largely used for fuel, charcoal, and occasionally manufactured into coarse lumber.

NOTE.—Upon the island of Nantucket, Massachusetts, this species is now greatly injured by the attacks of the destructive caterpillar of the pine moth (*Retina frustrana*, Scudder in *Pub. Massachusetts Ag. Soc.* 1883 & t).

372.—*Pinus serotina*, Michaux,

Fl. Bor.-Am. ii, 205.—Willdenow, *Spec.* iv, 499.—Persoon, *Syn.* ii, 578.—Michaux f. *Hist. Arb. Am.* i, 86, t. 7; *N. American Sylva*, 3 ed. iii, 117, t. 142.—Nouveau Duhamel, v, 246, t. 75, f. 1.—Pursh, *Fl. Am. Sept.* ii, 643.—Poiret, *Suppl.* iv, 417.—Nuttall, *Genera*, ii, 223.—Lambert, *Pinus*, 1 ed. iii, 35, t. 18.—Elliott, *Sk.* ii, 634.—Sprengel, *Syst.* ii, 887.—Torrey, *Compend. Fl. N. States*, 360.—Beck, *Bot.* 339.—Eaton, *Manual*, 6 ed. 265.—London, *Arboretum*, iv, 2242, f. 2127-2131.—Forbes, *Pinetum Woburn.* 47, t. 16.—Eaton & Wright, *Bot.* 359.—Antoine, *Conif.* 27, t. 8, f. 2.—Lindley in *Penn. Cycl.* xvii, 172.—Link in *Linnaea*, xv, 504.—Spach, *Hist. Veg.* xi, 389.—Giboul, *Arb. Resin.* 32.—Endlicher, *Syn. Conif.* 163.—Knight, *Syn. Conif.* 30.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 217.—Carrière, *Trait. Conif.* 341; 2 ed. 449.—Darby, *Bot. S. States*, 514.—Gordon, *Pinetum*, 209; 2 ed. 235.—Chapman, *Fl. S. States*, 433.—Curtis in *Rep. Geological Surv. N. Carolina*, 1860, iii, 21.—Henkel & Hochstetter, *Nadelhölz.* 70.—Nelson, *Pinaceæ*, 129.—Parlatore in *De Candolle, Prodr.* xvi<sup>2</sup>, 394.—Koch, *Dendrologie*, ii<sup>2</sup>, 305.—Vasey, *Cat. Forest Trees*, 31.

*P. Taeda*, var. *alopeuroidea*, Aiton, *Hort. Kew.* 2 ed. v, 317.—London, *Arboretum*, iv, 2237.

*P. rigida*, var. *serotina*, London, *Encycl. Pl.* 979, f. 1824-1827.—Cooper in *Smithsonian Rep.* 1858, 257.—Hoopes, *Evergreens*, 120.—Engelmann in *Trans. St. Louis Acad.* iv, 183.

## POND PINE.

North Carolina, south near the coast to the head of the Saint John's river, Florida.

A tree 12 to 24 meters in height, with a trunk 0.60 to 0.90 meter in diameter; inundated borders of streams and ponds in low, peaty soil; not common.

Wood heavy, soft, not strong, brittle, coarse-grained, compact; bands of small summer cells broad, forming fully one-half the annual growth, very resinous, dark colored, conspicuous, resin passages few, large; medullary rays numerous, obscure; color, dark orange, the thick sap-wood pale yellow; specific gravity 0.7942; ash, 0.17.

373.—*Pinus inops*, Aiton,

*Hort. Kew.* iii, 367; 2 ed. v, 316.—Michaux, *Fl. Bor.-Am.* ii, 204.—Lambert, *Pinus*, 1 ed. i, 18, t. 13; 2 ed. i, 21, t. 14; 3 ed. i, 25, t. 12.—Willdenow, *Spec.* iv, 496; *Enum.* 983; *Berl. Baumz.* 266.—Persoon, *Syn.* ii, 578.—Michaux f. *Hist. Arb. Am.* i, 58, t. 4; *N. American Sylva*, 3 ed. iii, 103, t. 139.—Nouveau Duhamel, v, 236, t. 69, f. 1.—Pursh, *Fl. Am. Sept.* ii, 641.—Smith in *Rees' Cycl.* xxviii, No. 10.—Barton, *Prodr. Fl. Philadelph.* 93.—*Compend. Fl. Philadelph.* ii, 183.—Nuttall, *Genera*, ii, 223.—Hayne, *Dend. Fl.* 173.—Elliott, *Sk.* ii, 633.—Sprengel, *Syst.* ii, 886.—Torrey, *Compend. Fl. N. States*, 359.—Audubon, *Birds*, t. 97.—Beck, *Bot.* 338.—Eaton, *Manual*, 6 ed. 265.—Bon Jard. 1837, 976.—London, *Arboretum*, iv, 2192, f. 2068-2071.—Forbes, *Pinetum Woburn.* 15, t. 4.—Hooker, *Fl. Bor.-Am.* ii, 161, in part.—Eaton & Wright, *Bot.* 358.—Antoine, *Conif.* 17, t. 5, f. 3.—Lindley in *Penn. Cycl.* xvii, 171.—Link in *Linnaea*, xv, 500.—Spach, *Hist. Veg.* xi, 386.—Endlicher, *Syn. Conif.* 167.—Knight, *Syn. Conif.* 26.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 217.—Carrière, *Trait. Conif.* 361; 2 ed. 471.—Darlington, *Fl. Cestriae*, 3 ed. 290.—Darby, *Bot. S. States*, 514.—Gordon, *Pinetum*, 167; 2 ed. 238.—Cooper in *Smithsonian Rep.* 1858, 257.—Chapman, *Fl. S. States*, 433.—Curtis in *Rep. Geological Surv. N. Carolina*, 1860, iii, 20.—Wood, *Cl. Book*, 661; *Bot. & Fl.* 313.—Henkel & Hochstetter, *Nadelhölz.* 22.—Nelson, *Pinaceæ*, 113.—Gray, *Manual N. States*, 5 ed. 470.—Hoopes, *Evergreens*, 84.—Parlatore in *De Candolle, Prodr.* xvi<sup>2</sup>, 380 (excl. syn. *variabilis*).—Vasey, *Cat. Forest Trees*, 30.—Veitch, *Manual Conif.* 158.

*P. Virginiana*, Miller, *Gard. Dict.* 7 ed. No. 9.—Du Roi, *Obs. Bot.* 43; *Harbk.* 2 ed. ii, 35.—Marshall, *Arbustum*, 102.—Wangenheim, *Amer.* 74.—Koch, *Dendrologie*, ii<sup>2</sup>, 299.

*P. Taeda*, var. *Virginiana*, Poiret in Lamarek, *Dict.* v, 340.

## JERSEY PINE. SCRUB PINE.

Middle Island, Long island, Tottenville, and Clifton, Staten island, New York, south, generally near the coast, to the valley of the Savannah river (Aiken, South Carolina), and through eastern and middle Kentucky to "the knobs" of southeastern Indiana.

A tree 24 to 36 meters in height, with a trunk 0.60 to 0.90 meter in diameter, or in the Atlantic states generally much smaller; sandy, generally barren soil, reaching its greatest development west of the Alleghany mountains.

Wood light, soft, not strong, brittle, very close-grained, compact, durable; bands of small summer cells broad, very resinous, conspicuous, resin passages few, not prominent; medullary rays numerous, thin; color, light orange, the thick sap-wood nearly white; specific gravity, 0.5309; ash, 0.30; largely used for fuel, and in Kentucky and Indiana preferred for and largely manufactured into water-pipes and pump-logs.

374.—*Pinus clausa*, Vasey,

Cat. Forest Trees, 30.

*P. inops*, var. *clausa*, Engelmann in Trans. St. Louis Acad. iv, 183.—Chapman, Fl. S. States, Suppl. 650.

## SAND PINE. SCRUB PINE. SPRUCE PINE.

Florida, shores of Pensacola bay, south, generally within 30 miles of the coast, to Pease creek, and occupying a narrow ridge along the east coast south of Saint Augustine.

A tree 21 to 24 meters in height, with a trunk 0.60 to 0.75 meter in diameter, or on the west coast rarely 6 to 9 meters in height; barren, sandy dunes and ridges; most common and reaching its greatest development about the head of Halifax bay.

Wood light, soft, not strong, brittle; bands of small summer cells broad, very resinous, conspicuous, resin passages numerous, prominent; medullary rays numerous, thin; color, light orange or yellow, the thick sap-wood nearly white; specific gravity, 0.5576; ash, 0.31; occasionally used for the masts of small vessels.

375.—*Pinus pungens*, Michaux f.

Hist. Arb. Am. i, 61, t. 5; N. American Sylva, 3 ed. iii, 105, t. 140.—Nouveau Duhamel, v, 236, t. 67, f. 4.—Aiton, Hort. Kew. 2 ed. v, 314.—Pursh, Fl. Am. Sept. ii, 643.—Poirot, Suppl. iv, 417.—Elliott, Sk. ii, 635.—Sprengel, Syst. ii, 886.—Eaton, Manual, 6 ed. 265.—Lambert, Pinus, 1 ed. iii, 34, t. 17.—London, Arboretum, iv, 2197, f. 2077-2080.—Forbes, Pinetum Woburn. 17, t. 5.—Eaton & Wright, Bot. 359.—Antoine, Conif. 18, t. 5, f. 4.—Lindley in Penn. Cycl. xvii, 171.—Nuttall, Sylva, iii, 125; 2 ed. ii, 184.—Spach, Hist. Veg. xi, 287.—Endlicher, Syn. Conif. 166.—Knight, Syn. Conif. 27.—Lindley & Gordon in Jour. Hort. Soc. London, v, 217.—Carrière, Trait. Conif. 359; 2 ed. 470.—Darby, Bot. S. States, 515.—Gordon, Pinetum, 181; 2 ed. 254.—Cooper in Smithsonian Rep. 1858, 257.—Chapman, Fl. S. States, 432.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 20.—Wood, Cl. Book, 660; Bot. & Fl. 313.—Henkel & Hochstetter, Nadelholz, 21.—Nelson, Pinaceæ, 127.—Gray, Manual N. States, 5 ed. 469.—Hoopes, Evergreens, 98.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 379.—Koch, Dendrologie ii<sup>2</sup>, 304.—Vasey, Cat. Forest Trees, 30.—Meehan in Rep. Penn. Fruit Growers' Soc. 1877 & t.—Engelmann in Trans. St. Louis Acad. iv, 183.—Veitch, Manual Conif. 158.

## TABLE-MOUNTAIN PINE. HICKORY PINE.

Alleghany mountains, Pennsylvania to Tennessee.

A tree 9 to 18 meters in height, with a trunk 0.60 to 1.05 meter in diameter; most common and reaching its greatest development upon the high mountains of East Tennessee, here often the prevailing species and forming extensive forests.

Wood light, soft, not strong, brittle, coarse-grained, compact; bands of small summer cells broad, resinous, conspicuous, resin passages numerous, large; medullary rays numerous, prominent; color, light brown, the thick sap-wood nearly white; specific gravity, 0.4935; ash, 0.27; in Pennsylvania largely manufactured into charcoal.

376.—*Pinus muricata*, D. Don,

Trans. Linnæan Soc. xvii, 441.—Lambert, Pinus, 1 ed. iii, t. 84.—London, Arboretum, iv, 2269, f. 2180.—Hooker & Arnott, Bot. Beechey, 393.—Antoine, Conif. 32, t. 14, f. 1.—Nuttall, Sylva, iii, 113; 2 ed. ii, 172.—Endlicher, Syn. Conif. 161.—Knight, Syn. Conif. 26.—Gordon in Jour. Hort. Soc. London, iv, 216 & f. (Fl. des Serres, v, 517<sup>b</sup> & f.); Pinetum, 173; 2 ed. 246 (excl. syn. *Murrayana*).—Lindley & Gordon in Jour. Hort. Soc. London, v, 217.—Carrière, Trait. Conif. 359; 2 ed. 470.—Torrey, Bot. Mex. Boundary Survey, 209, t. 54 (*P. Edgariana* on plate).—Cooper in Smithsonian Rep. 1858, 261.—Henkel & Hochstetter, Nadelholz, 60.—Nelson, Pinaceæ, 121.—Hoopes, Evergreens, 92.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 379.—Fowler in London Gard. Chronicle, 1872, 1164.—Koch, Dendrologie, ii<sup>2</sup>, 302.—Vasey, Cat. Forest Trees, 30.—Engelmann in Trans. St. Louis Acad. iv, 183; Bot. California, ii, 128.—Veitch, Manual Conif. 151.—London Gard. Chronicle, 1884, 49, f. 7-9.

*P. inops*, var. Bentham, Pl. Hartweg. 337.

*P. Edgariana*, Hartweg in Jour. Hort. Soc. London, iii, 217, 226.

*P. contorta*, Bolander in Proc. California Acad. iii, 227, 317 [not Douglas].

## OBISPO PINE. BISHOP'S PINE.

California, Mendocino county south through the Coast ranges to San Luis Obispo county.

A tree 24 to 36 meters in height, with a trunk 0.30 to 0.90 meter in diameter, or more often not exceeding 15 meters in height; cold peat bogs or barren, sandy gravel; always exposed to the winds and fogs of the ocean, and not found above 2,000 feet elevation, reaching its greatest development in Mendocino county; rare and local.

Wood light, very strong and hard, rather coarse-grained, compact; bands of small summer cells broad, resinous, resin passages few, not prominent; medullary rays numerous, thin; color, light brown, the thick sap-wood nearly white; specific gravity, 0.4942; ash, 0.26.

377.—*Pinus mitis*, Michaux,

Fl. Bor.-Am. ii, 204.—Michaux f. Hist. Arb. Am. i, 52, t. 3; N. American Sylva, 3 ed. iii, 96, t. 137.—Barton, Prodr. Fl. Philadelph. 93.—Poiret, Suppl. iv, 417.—Loudon, Arboretum, iv, 2195, f. 2072-2076.—Antoine, Conif. 16, t. 5, f. 1.—Lindley in Penn. Cycl. xvii, 171.—Spach, Hist. Veg. xi, 386.—Torrey, Fl. N. York, ii, 229.—Endlicher, Syn. Conif. 167.—Knight, Syn. Conif. 26.—Lindley & Gordon in Jour. Hort. Soc. London, v, 217.—Carrière, Trait. Conif. 361; 2 ed. 472.—Gordon, Pinetum, 170; 2 ed. 243 (excl. syn. Roylet).—Cooper in Smithsonian Rep. 1858, 275.—Chapman, Fl. S. States, 433.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 19.—Lesquereux in Owen's 2d Rep. Arkansas, 389.—Wood, Cl. Book, 660; Bot. & Fl. 313.—Henkel & Hochstetter, Nadelhölz. 23.—Gray, Manual N. States, 5 ed. 470.—Hoopes, Evergreens, 88.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 380.—Young, Bot. Texas, 516.—Koeh, Dendrologie, ii<sup>2</sup>, 300.—Vasey, Cat. Forest Trees, 30.—Broadhead in Coulter's Bot. Gazette, iii, 60.—Engelmann in Trans. St. Louis Acad. iv, 184.—Ridgway in Proc. U. S. Nat. Mus. 88.

*P. echinata*, Miller, Dict. 7 ed. No. 12.—Marshall, Arbustum, 180?—Wangenheim, Amer. 74.

*P. Virginiana*, var. *echinata*, Du Roi, Harbk. ii, 38.

*P. Taeda*, var. *variabilis*, Aiton, Hort. Kew. iii, 368.

*P. variabilis*, Lambert, Pinus, 1 ed. i, 22, t. 15; 2 ed. i, 25, t. 16; 3 ed. i, 29, t. 14.—Willdenow, Spec. iv, 498.—Persoon, Syn. ii, 578.—Nouveau Duhamel, v, 235, t. 69, f. 2.—Aiton, Hort. Kew. 2 ed. v, 316.—Pursh, Fl. Am. Sept. ii, 643.—Smith in Rees' Cycl. xxviii, No. 12.—Barton, Compend. Fl. Philadelph. ii, 183.—Nuttall, Genera, ii, 223.—Elliott, Sk. ii, 633.—Sprengel, Syst. ii, 886.—Torrey, Compend. Fl. N. States, 360.—Beck, Bot. 339.—Eaton, Manual, 6 ed. 265.—Forbes, Pinetum Woburn. 35, t. 11.—Eaton & Wright, Bot. 358.—Antoine, Conif. 15, t. 5, f. 2.—Link in Linnæa, xv, 502.—Endlicher, Syn. Conif. 168 (excl. syn.).—Darby, Bot. S. States, 514.

*P. rigida*, Porcher, Resources S. States, 504 [not Miller].

## YELLOW PINE. SHORT-LEAVED PINE. SPRUCE PINE. BULL PINE.

Staten island, New York, south to the Chattahoochee region of western Florida, through the Gulf states to Tennessee and eastern Texas, and through Arkansas to the Indian territory, southeastern Kansas, southern Missouri, and in Union county, Illinois.

A tree 24 to 30 meters in height, with a trunk 0.60 to 1.35 meter in diameter; light sandy soil or, less commonly, along the low borders of swamps; forming west of the Mississippi river, mixed with oaks and other deciduous trees, extensive forests; the only species of northern Arkansas, Kansas, and Missouri, reaching its greatest development in western Louisiana, southern Arkansas, and eastern Texas.

Wood, varying greatly in quality and amount of sap, heavy, hard, strong, generally coarse-grained, compact; bands of small summer cells broad, often occupying half the width of the annual growth; very resinous, resin passages numerous, large; medullary rays numerous, conspicuous; color, orange, the sap-wood nearly white; specific gravity, 0.6104; ash, 0.29; largely manufactured into lumber, especially in the states west of the Mississippi river, and among yellow pines only inferior in value to that of *P. palustris*.

378.—*Pinus glabra*, Walter,

Fl. Caroliniana, 237.—Poiret in Lamarck, Dict. v, 342.—Ravenel in Proc. Elliott Soc. i, 52.—Chapman, Fl. S. States, 433.—Porcher, Resources S. Forests, 506.—Hoopes, Evergreens, 82.—Vasey, Cat. Forest Trees, 30.—Engelmann in Trans. St. Louis Acad. iv, 184.

?*P. mitis*, var. *paupera*, Wood, Cl. Book, 660.

## CEDAR PINE. SPRUCE PINE. WHITE PINE.

South Carolina, south to the Chattahoochee region of western Florida, generally near the coast, and through the Gulf states south of latitude 32° 30' to the valley of the Pearl river, Louisiana.

A tree 24 to 30 meters in height, with a trunk 0.60 to 1.20 meter in diameter; rich bottom lands and hummocks in dense forests of hard-wood trees, reaching its greatest development in Alabama and Mississippi; not common and local.

Wood light, soft, not strong, brittle, very coarse-grained, not durable; bands of small summer cells broad, not resinous, resin passages few, not large; medullary rays numerous, obscure; color, light brown, the sap-wood nearly white; specific gravity, 0.3931; ash, 0.45.

379.—*Pinus Banksiana*, Lambert,

*Pinus*, 1 ed. i, 7, t. 3; 2 ed. i, 7, t. 3; 3 ed. i, 9, t. 3.—Persoon, *Syn.* ii, 578.—Desfontaines, *Hist. Arb.* ii, 611.—Nouveau Duhamel, v, 234, t. 67, f. 3.—Aiton, *Hort. Kew.* 2 ed. v, 315.—Pursh, *Fl. Am. Sept.* ii, 642.—Smith in Rees' *Cycl.* xxviii, No. 4.—Nuttall, *Genera*, ii, 223; *Sylva*, iii, 124; 2 ed. ii, 132.—Sprengel, *Syst.* ii, 886.—Torrey, *Compend. Fl. N. States*, 360.—Beck, *Bot.* 339.—Eaton, *Manual*, 6 ed. 265.—Loudon, *Arboretum*, iv, 2190, f. 2064-2067.—Forbes, *Pinetum Woburn*, 13, t. 3.—Hooker, *Fl. Bor.-Am.* ii, 161.—Eaton & Wright, *Bot.* 358.—Antoine, *Conif.* 8, t. 4, f. 2.—Lindley in *Penn. Cycl.* xvii, 171.—Link in *Linnaea*, xv, 491.—Spach, *Hist. Veg.* xi, 379.—Endlicher, *Syn. Conif.* 177.—Knight, *Syn. Conif.* 26.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 218 (excl. *syn. contorta*).—Parry in Owen's *Rep.* 618.—Carrière, *Trait. Conif.* 381; 2 ed. 485.—Gordon, *Pinetum*, 163; 2 ed. 230.—Richardson, *Arctic Exped.* 441.—Cooper in *Smithsonian Rep.* 1858, 257.—Hooker f. in *Trans. Linnæan Soc.* xxiii<sup>3</sup>, 301.—Wood, *Cl. Book*, 661.—Henkel & Hochstetter, *Nadelhölz.* 44.—Nelson, *Pinaceæ*, 104.—Gray, *Manual N. States*, 5 ed. 470.—Hoopes, *Evergreens*, 78.—Vasey, *Cat. Forest Trees*, 29.—Macoun in *Geological Rep. Canada*, 1875-'76, 211.—Engelmann in *Trans. St. Louis Acad.* iv, 184.—Sears in *Bull. Essex Inst.* xiii, 186.—Bell in *Geological Rep. Canada*, 1879-'80, 46.—Veitch, *Manual Conif.* 158.

*P. sylvestris*, var. *divaricata*, Aiton, *Hort. Kew.* iii, 366.

*P. Hudsonica*, Poiret in Lamarek, *Dict.* v, 339.—Parlatore in De Candolle, *Prodr.* xvi<sup>3</sup>, 380.—Wood, *Bot. & Fl.* 313.—Koch, *Dendrologie*, ii<sup>2</sup>, 298.

*P. rupestris*, Michaux f. *Hist. Arb. Am.* i, 49, t. 2; *N. American Sylva*, 3 ed. iii, 95, t. 136.

## GRAY PINE. SCRUB PINE. PRINCE'S PINE.

Bay of Chaleur, New Brunswick, to the southern shores of Hudson bay, northwest to the Great Bear lake, the valley of the Mackenzie river, and the eastern slope of the Rocky mountains between the fifty-second and sixty-fifth degrees of north latitude; south to northern Maine, Ferrisburg, Vermont (*R. E. Robinson*), the southern shore of lake Michigan, and central Minnesota.

A small tree, 9 to 22 meters in height, with a trunk rarely exceeding 0.75 meter in diameter; barren, sandy soil or, less commonly, in rich loam; most common north of the boundary of the United States, and reaching its greatest development in the region north of lake Superior, here often forming considerable forests; toward its extreme western limits associated and often confounded with the closely allied *P. contorta* and *P. Murrayana* of the Pacific region.

Wood light, soft, not strong, rather close-grained, compact; bands of small summer cells not broad, very resinous, conspicuous, resin passages few, not large; medullary rays numerous, obscure; color, clear light brown or, rarely, orange, the thick sap-wood almost white; specific gravity, 0.4761; ash, 0.23; largely used for fuel, railway ties, etc.

380.—*Pinus palustris*, Miller,

*Dict.* 7 ed. No. 14.—Marshall, *Arbustum*, 100.—Wangenheim, *Amer.* 73.—Walter, *Fl. Caroliniana*, 237.—Aiton, *Hort. Kew.* iii, 368; 2 ed. v, 317.—Abbot, *Insects Georgia*, i, t. 42.—Du Roi, *Harbk.* 2 ed. ii, 66.—Michaux, *Fl. Bor.-Am.* ii, 204.—Lambert, *Pinus*, 1 ed. i, 27, t. 20; 2 ed. i, 30, t. 21; 3 ed. i, 41, t. 24, 25.—Willdenow, *Spec.* iv, 499.—Poiret in Lamarek, *Dict.* v, 341.—Persoon, *Syn.* ii, 578.—Desfontaines, *Hist. Arb.* ii, 612.—Pursh, *Fl. Am. Sept.* ii, 644.—Smith in Rees' *Cycl.* xxviii, No. 15.—Nuttall, *Genera*, ii, 223; *Sylva*, iii, 126; 2 ed. ii, 135.—Hayne, *Dend. Fl.* 174.—Elliott, *Sk.* ii, 637.—Sprengel, *Syst.* ii, 887.—Eaton, *Manual*, 6 ed. 266.—Forbes, *Pinetum Woburn*, 59, t. 22.—Eaton & Wright, *Bot.* 359.—Antoine, *Conif.* 23, t. 6, f. 2.—Link in *Linnaea*, xv, 206.—Griffith, *Med. Bot.* 604.—Darby, *Bot. S. States*, 515.—Cooper in *Smithsonian Rep.* 1858, 257.—Wood, *Cl. Book*, 660.—Porcher, *Resources S. Forests*, 495.—Michaux f. *N. American Sylva*, 3 ed. iii, 106, t. 141 (the plate as *P. australis*).

*P. australis*, Michaux f. *Hist. Arb. Am.* i, 64, t. 6.—Nouveau Duhamel, v, 246, t. 75, f. 3.—Loudon, *Arboretum*, iv, 2255, f. 2156-2160.—Lindley in *Penn. Cycl.* xvii, 171.—Spach, *Hist. Veg.* xi, 392.—Endlicher, *Syn. Conif.* 165.—Carson, *Med. Bot.* ii, 43, t. 87.—Gihoul, *Arb. Resin.* 33.—Knight, *Syn. Conif.* 30.—Lindley & Gordon in *Jour. Hort. Soc. London*, v, 217.—Carrière, *Trait. Conif.* 345; 2 ed. 450.—Gordon, *Pinetum*, 187; *Suppl.* 63; 2 ed. 260.—Chapman, *Fl. S. States*, 434.—Curtis in *Rep. Geological Surv. N. Carolina*, 1860, iii, 24.—Wood, *Bot. & Fl.* 313.—Henkel & Hochstetter, *Nadelhölz.* 65.—Nelson, *Pinaceæ*, 103.—Hoopes, *Evergreens*, 109.—Parlatore in De Candolle, *Prodr.* xvi<sup>3</sup>, 392.—Young, *Bot. Texas*, 517.—Vasey, *Cat. Forest Trees*, 31.—Bentley & Trimen, *Med. Pl.* iv, 258, t. 258.—Engelmann in *Trans. St. Louis Acad.* iv, 185.—Veitch, *Manual Conif.* 172.

## LONG-LEAVED PINE. SOUTHERN PINE. GEORGIA PINE. YELLOW PINE. HARD PINE.

Southeastern Virginia, south to cape Canaveral and Tampa bay, Florida, and through the Gulf states to the valley of the Red river, Louisiana, and the Trinity river, Texas, rarely extending beyond 150 miles from the coast.

A tree of the first economic value, 18 to 29 meters in height, with a trunk 0.60 to 1.20 meter in diameter; dry, sandy loam of the maritime plain, generally of Tertiary formation, and forming, outside of the river bottoms, extensive forests almost to the exclusion of other species, or toward its extreme interior range, especially in the Gulf states, occupying rolling hills, here mixed with oaks and various deciduous trees; rarely along the borders of swamps in low, wet soil.

Wood heavy, exceedingly hard, very strong, tough, coarse-grained, compact, durable; bands of small summer cells broad, occupying fully half the width of the annual growth, very resinous, dark colored, resin passages few, not conspicuous; medullary rays numerous, conspicuous; color, light red or orange, the thin sap-wood nearly white; specific gravity, 0.6999; ash, 0.25; largely manufactured into lumber and used in construction of all sorts, for ship-building, fencing, railway ties, etc.

The turpentine, tar, pitch, rosin, and spirits of turpentine manufactured in the United States are almost exclusively produced by this species (*U. S. Dispensatory*, 14 ed. 709, 899.—*Nat. Dispensatory*, 2 ed. 1417.—*Flückiger & Hanbury, Pharmacographia*, 545).

381.—*Pinus Cubensis*, Grisebach,

Mem. Am. Acad. viii, 530; Cat. Pl. Cuba, 217.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 396.

*P. Taeda*, var. *heterophylla*, Elliott, Sk. ii, 636.

*P. Elliottii*, Engelmann; Vasey, Cat. Forest Trees, 30; Trans. St. Louis Acad. iv, 186, t. 1, 2, 3.—Chapman, Fl. S. States, Suppl. 650.

*P. Cubensis*, var. *terthrocarpa*, Wright.—Grisebach, Cat. Pl. Cuba, 217.

## SLASH PINE. SWAMP PINE. BASTARD PINE. MEADOW PINE.

South Carolina (Bluffton, *Mellichamp*), south near the coast to the southern keys of Florida, west along the Gulf coast to the valley of the Pearl river, Louisiana, not extending beyond 50 or 60 miles inland; in the West Indies.

A tree 24 to 30 meters in height, with a trunk 0.60 to 0.90 meter in diameter; light sandy soil along the dunes and marshes of the coast, or wet clay borders of ponds, abandoned fields, etc., and now rapidly taking possession of ground from which the forests of *P. palustris* have been removed; the only species of Florida south of cape Canaveral and bay Biscayne.

Wood heavy, exceedingly hard, very strong, tough, coarse-grained, compact, durable; bands of small summer cells very broad, occupying fully half the width of the annual growth, very resinous, conspicuous, resin passages few, not large; medullary rays numerous, rather prominent; color, rich dark orange, the sap-wood lighter, often nearly white; specific gravity, 0.7504; ash, 0.26; hardly inferior in value to that of *P. palustris*, although rarely manufactured into lumber.

Turpentine is occasionally manufactured in southern Florida from this species.

NOTE.—Specimens collected upon the southern keys of Florida by A. H. Curtiss connect the forms of South Carolina, Georgia, and northern Florida with the West Indian tree.

382.—*Picea nigra*, Link,

Linnaea, xv, 520.—Carrière, Trait. Conif. 241; 2 ed. 323.—Hooker f. in Trans. Linnæan Soc. xxiii<sup>2</sup>, 301.—Brunet, Hist. Picea, 10 & t. f. B.—Peck in Trans. Albany Inst. viii, 283.—Engelmann in London Gard. Chronicle, 1879, 334.—Sears in Bull. Essex Inst. xiii, 185.

*Abies Mariana*, Miller, Dict.—Wangenheim, Amer. 75.

*Pinus Mariana*, Du Roi, Obs. Bot. 38; Harbk. ii, 107.—Ehrhart, Beitr. iii, 24.

*Pinus Abies Canadensis*, Marshall, Arbustum, 103.

*Pinus Americana rubra*, Wangenheim, Amer. 75.

*Pinus nigra*, Aiton, Hort. Kew. iii, 370; 2 ed. v, 319.—Lambert, Pinus, 1 ed. i, 41, t. 27; 2 ed. i, 45, t. 27; 3 ed. i, 64, t. 37.—Willdenow, Spec. iv, 506; Enum. 990; Berl. Baumz. 278.—Persoon, Syn. ii, 579.—Pursh, Fl. Am. Sept. ii, 640.—Smith in Rees' Cycl. xxviii, No. 20.—Barton, Compend. Fl. Philadelph. ii, 182.—Nuttall, Genera, ii, 223.—Hayne, Dend. Fl. 177.—Elliott, Sk. ii, 640.—Sprengel, Syst. ii, 885.—Torrey, Compend. Fl. N. States, 359; Fl. N. York, ii, 230.—Beck, Bot. 340.—Eaton, Manual, 6 ed. 264.—Hooker, Fl. Bor.-Am. ii, 163.—Eaton & Wright, Bot. 358.—Bigelow, Fl. Boston. 3 ed. 336.—Antoine, Conif. 88, t. 34, f. 3.—Endlicher, Syn. Conif. 115.—Darby, Bot. S. States, 515.—Porcher, Resources S. Forests, 505.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 413.

*Pinus Americana*, Gærtner, Fruct. ii, 60, t. 91, f. 1.

*Pinus rubra*, Lambert, Pinus, 1 ed. i, 48, t. 28; 2 ed. i, 47, t. 30; 3 ed. i, 66, t. 38 [not Michaux f.].—Persoon, Syn. ii, 579.—Aiton, Hort. Kew. 2 ed. v, 319.—Pursh, Fl. Am. Sept. ii, 640.—Smith in Rees' Cycl. xxviii, No. 23.—Nuttall, Genera, ii, 223.—Sprengel, Syst. ii, 885.—Torrey, Compend. Fl. N. States, 359.—Beck, Bot. 340.—Eaton, Manual, 6 ed. 264.—Hooker, Fl. Bor.-Am. ii, 164.—Eaton & Wright, Bot. 358.—Antoine, Conif. 87, t. 34, f. 2.—Endlicher, Syn. Conif. 113.—Gihoul, Arb. Resin. 44.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 413.

*Abies denticulata*, Michaux, Fl. Bor.-Am. ii, 206.—Poiret in Lamarek, Dict. vi, 520.

*Abies nigra*, Poiret in Lamarek, Dict. vi, 520.—Desfontaines, Hist. Arb. ii, 580.—Michaux f. Hist. Arb. Am. i, 124, t. 11; N. American Sylva, 3 ed. iii, 139, t. 147.—Nouveau Duhamel, v, 292, t. 81, f. 1.—Lindley in Penn. Cycl. i, 32.—Loudon, Arboretum, iv, 2312, f. 2225-2227.—Spach, Hist. Veg. xi, 410, in part.—Emerson, Trees Massachusetts, 81; 2 ed. ii, 96.—Griffith, Med. Bot. 606.—Knight, Syn. Conif. 36.—Lindley & Gordon in Jour. Hort. Soc. London, v, 211.—Parry in Owen's Rep. 618.—Gordon, Pinetum, 11; 2 ed. 17.—Richardson, Arctic Exped. 442.—Cooper in Smithsonian Rep. 1858, 257.—Chapman, Fl. S. States, 434.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 27.—Wood, Cl. Book, 662; Bot. & Fl. 313.—Porcher, Resources S. Forests, 507.—Henkel & Hochstetter, Nadelhölz. 191.—Nelson, Pinaceæ, 50.—Gray, Manual N. States, 5 ed. 471.—Hoopes, Evergreens, 169.—Vasey, Cat. Forest Trees, 33.—Guibourt, Hist. Drogues, 7 ed. ii, 247.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Bell in Geological Rep. Canada, 1879-'80, 44.—Veitch, Manual Conif. 74.

*Abies rubra*, Poiret in Lamarek, Dict. vi, 520.—Desfontaines, Hist. Arb. ii, 580.—Loudon, Arboretum, iv, 2316, f. 2228.—Forbes, Pinetum Woburn. 101, t. 35.—Knight, Syn. Conif. 37.—Lindley & Gordon in Jour. Hort. Soc. London, v, 211.—Gordon, Pinetum, 11; 2 ed. 17.—Henkel & Hochstetter, Nadelhölz. 189.—Nelson, Pinaceæ, 51.

*P. rubra*, Link in Linnæa, xv, 521.—Carrière, Trait. Conif. 240; 2 ed. 322.

*Abies nigra*, var. *rubra*, Michaux f. Hist. Arb. Am. i, 123; N. American Sylva, 3 ed. iii, 141.—Spach, Hist. Veg. xi, 411.—Hoopes, Evergreens, 170.

? *Abies rubra*, var. *arctica*, Lindley & Gordon in Jour. Hort. Soc. London, v, 211.

*Abies alba*, Chapman, Fl. S. States, 435 [not Poiret].

*Abies Americana*, Koch, Dendrologie, ii<sup>2</sup>, 241.

*P. nigra*, var. *rubra*, Engelmann in London Gard. Chronicle, 1879, 334.

*Abies arctica*, Hort.

*Abies Marylandica*, Hort.

#### BLACK SPRUCE.

Newfoundland, northern Labrador to Ungava bay, Nastapokee sound, cape Churchill, Hudson bay, and northwest to the mouth of the Mackenzie river and the eastern slope of the Rocky mountains; south through the northern states to Pennsylvania, central Michigan, Wisconsin, and Minnesota, and along the Alleghany mountains to the high peaks of North Carolina.

A tree 15 to 21 meters in height, with a trunk 0.60 to 0.90 meter in diameter; light, dry, rocky soil, forming, especially north of the fiftieth degree of latitude, extensive forests on the water-sheds of the principal streams or in cold, wet swamps; then small, stunted, and of little value (*P. rubra*).

Wood light, soft, not strong, close, straight-grained, compact, satiny; bands of small summer cells thin, resinous, resin passages few, minute; medullary rays few, conspicuous; color, light red or often nearly white, the sap-wood lighter; specific gravity, 0.4584; ash, 0.27; largely manufactured into lumber, used in construction, for ship-building, piles, posts, railway ties, etc.

Essence of spruce, prepared by boiling the young branches of this species, is used in the manufacture of spruce beer, a popular beverage (*U. S. Dispensatory*, 14 ed. 901).

383.—*Picea alba*, Link,

Linnaea, xv, 519.—Carrière, Trait. Conif. 238; 2 ed. 319.—Fl. des Serres, xxi, 157, t. 2251.—Brunet, Hist. Picea, 4 & t. f. A.—Engelmann in London Gard. Chronicle, 1879, 334.—Sears in Bull. Essex Inst. xiii, 184.

*Abies Canadensis*, Miller, Dict. No. 1.

*Pinus Canadensis*, Du Roi, Obs. Bot. 38; Harbk. ii, 124 [not Linnæus].—Wangenheim, Amer. 5, t. 1, f. 2.

*P. laxa*, Ehrhart, Beitr. iii, 24.

*P. glauca*, Mönch, Weiss. 73.

*Pinus alba*, Aiton, Hort. Kew. iii, 371; 2 ed. v, 318.—Lambert, Pinus, 1 ed. i, 39 t. 26; 2 ed. i, 43, t. 28; 3 ed. i, 61, t. 35.—Willdenow, Spec. iv, 507; Enum. 990; Berl. Baumz. 280.—Persoon, Syn. ii, 579.—Pursh, Fl. Am. Sept. ii, 641.—Smith in Rees' Cycl. xxviii, No. 21.—Eaton, Manual, 6 ed. 264.—Nuttall, Genera, ii, 223.—Hayne, Dend. Fl. 177.—Elliott, Sk. ii, 640.—Sprengel, Syst. ii, 885.—Torrey, Compend. Fl. N. States, 359; Fl. N. York, ii, 231.—Meyer, Fl. Labrador, 30.—Beck, Bot. 340.—Hooker, Fl. Bor.-Am. ii, 163.—Eaton & Wright, Bot. 358.—Bigelow, Fl. Boston. 3 ed. 386.—Antoine, Conif. 86, t. 34, f. 1.—Endlicher, Syn. Conif. 112.—Darby, Bot. S. States, 515.—Tuinbouw Flora, 1855, 1, t. 14, 15.—Walpers, Ann. v, 799.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 414.

*Pinus tetragona*, Mönch, Meth. 364.

*Abies alba*, Poiret in Lamarek, Dict. vi, 521.—Michaux, Fl. Bor.-Am. ii, 207.—Desfontaines, Hist. Arb. ii, 580.—Michaux f. Hist. Arb. Am. i, 133, t. 12; N. American Sylva, 3 ed. iii, 144, t. 148.—Nouveau Duhamel, v, 291, t. 81, f. 2.—Loudon, Arboretum, iv, 2310, f. 2224.—Forbes, Pinetum Woburn. 95, t. 33.—Nuttall, Sylva, iii, 129; 2 ed. ii, 189.—Spach, Hist. Veg. xi, 412.—Emerson, Trees Massachusetts, 84; 2 ed. i, 99.—Gihoul, Arb. Resin. 43.—Knight, Syn. Conif. 36.—Lindley & Gordon in Jour. Hort. Soc. London, v, 211.—Parry in Owen's Rep. 618.—Gordon, Pinetum, 2; 2 ed. 3.—Richardson, Arctic Exped. 442.—Cooper in Smithsonian Rep. 1858, 257.—Hooker f. in Trans. Linnæan Soc. xxiii<sup>2</sup>, 301.—Engelmann in Am. Jour. Sci. 2 ser. xxxiv, 330.—Wood, Cl. Book, 661; Bot. & Fl. 313.—Porcher, Resources S. Forests, 507.—Henkel & Hochstetter, Nadelhölz. 188.—Nelson, Pinaceæ, 47.—Gray, Manual N. States, 5 ed. 471.—Murray in Seemann, Jour. Bot. v, 253, t. 69, f. 2-7.—Hoopes, Evergreens, 157, f. 20.—Vasey, Cat. Forest Trees, 32.—Guibourt, Hist. Drogues, 7 ed. ii, 247.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Bell in Geological Rep. Canada, 1879-'80, 44c.

*Abies rubra*, var. *cærulea*, Loudon, Arboretum, iv, 2316.—Lindley & Gordon in Jour. Hort. Soc. London, v, 211.

*Abies cærulea*, Forbes, Pinetum Woburn. 99.

*P. cærulea*, Link in Linnaea, xv, 522.

*Pinus rubra*, var. *violacea*, Endlicher, Syn. Conif. 114.

*P. nigra*, var. *glauca*, Carrière, Trait. Conif. 1 ed. 242.

*Abies arctica*, Murray in Seemann, Jour. Bot. v, 253, t. 69, f. 1, 8-13.

*Abies laxa*, Koch, Dendrologie, ii<sup>2</sup>, 243.

*Abies alba*, var. *cærulea*, Carrière, Trait. Conif. 2 ed. 320.

*Abies alba*, var. *arctica*, Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 414.

## WHITE SPRUCE.

Newfoundland, northern shore of Labrador to Ungava bay, cape Churchill, and northwestward to the mouth of the Mackenzie river and the valley of the Yukon river, Alaska; south to the coast of Maine, northeastern Vermont (West Burke and Elmwood, *Pringle*), northern Michigan, Minnesota to Moose lake and the White Earth Indian reservation, the Black hills of Dakota (*R. Douglas*), along the Rocky mountains of northern Montana to the valley of the Blackfoot river (*Canby & Sargent*), Sitka, and British Columbia.

A tree 15 to 50 meters in height, with a trunk 0.60 to 0.90 meter in diameter; low, rather wet soil, borders of ponds and swamps; most common north of the boundary of the United States, and reaching its greatest development along the streams and lakes of the Flathead region of northern Montana at an elevation of 2,500 to 3,500 feet; the most important timber tree of the American subarctic forests north of the sixtieth degree of latitude, here more generally multiplied and of larger size than the allied *P. nigra*, with which it is associated; its distribution southward in British Columbia not yet satisfactorily determined.

Wood light, soft, not strong, close, straight-grained, compact, satiny; bands of small summer cells thin, not conspicuous, resin passages few, minute; medullary rays numerous, prominent; color, light yellow, the sap-wood hardly distinguishable; specific gravity, 0.4051; ash, 0.32; largely manufactured into lumber, although not distinguished in commerce from that of the black spruce (*P. nigra*).

384.—*Picea Engelmanni*, Engelmann,

Trans. St. Louis Acad. ii, 212; Wheeler's Rep. vi, 256; London Gard. Chronicle, 1879, 334; 1882, 145.—Carrière, Trait. Conif. 2 ed. 348.—G. M. Dawson in Canadian Nat. new ser. ix, 325.—Rusby in Bull. Torrey Bot. Club, ix, 80.

*Abies alba*, ? Torrey in Fremont's Rep. 97.

*Abies nigra*, Engelmann in Am. Jour. Sci. 2 ser. xxxiii, 330 [not Poiret].

*Abies Engelmanni*, Parry in Trans. St. Louis Acad. ii, 122; London Gard. Chronicle, 1863, 1035; Am. Nat. viii, 179; Proc. Davenport Acad. i, 149.—Regel, Gartenflora, 1864, 244.—Henkel & Hochstetter, Nadelhölz. 418.—Hoopes, Evergreens, 177, f. 22.—Watson in King's Rep. v, 332; Pl. Wheeler, 17.—Porter in Hayden's Rep. 1871, 494.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 130.—Vasey, Cat. Forest Trees, 33.—Koch, Dendrologie, ii<sup>2</sup>, 242.—Hall in Coulter's Bot. Gazette, ii, 91.—Sargent in London Gard. Chronicle, 1877, 631.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Brandege in Coulter's Bot. Gazette, iii, 32.—Bell in Geological Rep. Canada, 1879-'80, 56c.—Veitch, Manual Conif. 68.

*Pinus Engelmanni*, Engelmann in Proc. Am. Phil. Soc. new ser. xii, 209.

*Pinus commutata*, Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 417.—Gordon, Pinetum, 2 ed. 5.

## WHITE SPRUCE.

Peace River plateau, in latitude 55° 46' N. (*G. M. Dawson*), through the interior of British Columbia and along the Cascade mountains of Washington territory and Oregon to the valley of the Mackenzie river; along the principal ranges of the Rocky and Wahsatch mountains to the San Francisco mountains, Sierra Blanco, and mount Graham, Arizona.

A large tree, 24 to 46 meters in height, with a trunk 0.90 to 1.20 meter in diameter, or at its extreme elevation reduced to a low, prostrate shrub; dry, gravelly slopes and ridges between 5,000 and 11,500 feet elevation; the most valuable timber tree of the central Rocky Mountain region, here forming extensive forests, generally above 8,500 feet elevation; rare and of small size in the mountains of Washington territory, Oregon, and Montana.

Wood very light, soft, not strong, very close, straight-grained, compact, satiny; bands of small summer cells narrow, not conspicuous, resin passages few, minute; medullary rays numerous, conspicuous; color, pale yellow tinged with red, the sap-wood hardly distinguishable; specific gravity, 0.3449; ash, 0.32; in Colorado manufactured into lumber and largely used for fuel, charcoal, etc.

The bark rich in tannin, and in Utah sometimes used in tanning leather.

NOTE.—Forms of northern Montana too closely connect this species with the allied *P. alba*. The two species occur here, however, only at different elevations, in different soils, and never mingle.

385.—*Picea pungens*, Engelmann,

London Gard. Chronicle, 1879, 334; 1882, 145.—Masters in London Gard. Chronicle, 1883, 725, f. 130.

*P. Menziesii*, Engelmann in Trans. St. Louis Acad. ii, 214 [not Carrière].

*Abies Menziesii*, Engelmann in Am. Jour. Sci. 2 ser. xxxiii, 330 [not Lindley].—Gray in Proc. Philadelphia Acad. 1863, 76.—Watson in King's Rep. v, 333, in part.—Parry in Am. Nat. viii, 179 [not Lindley].—Porter in Hayden's Rep. 1871, 494.—Hoopes, Evergreens, 166, in part.—Rothrock in Pl. Wheeler, 28; Wheeler's Rep. vi, 10 [not Lindley].—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 131 [not Lindley].—Vasey, Cat. Forest Trees, 33, in part.—Brandege in Coulter's Bot. Gazette, iii, 32.

*Abies Menziesii Parryana*, André in Ill. Hort. xxiii, 198; xxiv, 53, 119.—Roezl in Ill. Hort. xxiv, 86.

*Abies Engelmanni glauca*, Veitch, Manual Conif. 69.

## WHITE SPRUCE. BLUE SPRUCE.

Valley of the Wind river, south through the mountain ranges of Wyoming, Colorado, and Utah.

A tree 30 to 46 meters in height, with a trunk 0.60 to 0.90 meter in diameter; borders of streams, in damp or wet soil, generally between 6,000 and 9,000 feet elevation, never forming forests or reaching as high elevations as the allied *P. Engelmanni*; rare and local.

Wood very light, soft, weak, close-grained, compact, satiny; bands of small summer cells narrow, not conspicuous, resin passages few, small; medullary rays numerous, prominent; color, very light brown or often nearly white, the sap-wood hardly distinguishable; specific gravity, 0.3740; ash, 0.38.

386.—*Picea Sitchensis*, Carrière,

Trait. Conif. 1 ed. 260; Engelmann in London Gard. Chronicle, 1879, 344; Bot. California, ii, 122.

*Pinus Sitchensis*, Bongard in Mem. Acad. St. Petersburg, 6 ser. ii, 104.—Hooker, Fl. Bor.-Am. ii, 164.—Endlicher, Syn. Conif. 123.

*Abies Menziesii*, Lindley in Penn. Cycl. 1, 32.—London, Arboretum, iv, 2321, f. 2232.—Forbes, Pinetum Woburn. 93, t. 32.—Nuttall, Sylva, iii, 131, t. 116; 2 ed. ii, 189, t. 116.—Knight, Syn. Conif. 37.—Lindley & Gordon in Jour. Hort. Soc. London, v, 211.—Newberry in Pacific R. R. Rep. vi, 56, 90, t. 9, f. 21.—Gordon, Pinetum, 6; 2 ed. 12.—Cooper in Smithsonian Rep. 1858, 202; Pacific R. R. Rep. xii<sup>2</sup>, 25, 69, in part.—Wood, Bot. & Fl. 314.—Lyal in Jour. Linnæan Soc. vii, 131, 133, 144.—Henkel & Hochstetter, Nadelhölz. 187.—Nelson, Pinaceæ, 148.—Rothrock in Smithsonian Rep. 1867, 433.—Hoopes, Evergreens, 166, in part.—Watson in King's Rep. v, 333, in part.—Veitch, Manual Conif. 73.

*Pinus Menziesii*, Douglas in Lambert, Pinus, 1 ed. iii, 161, t. 71.—Hooker, Fl. Bor.-Am. ii, 162.—Antoine, Conif. 85, t. 33, f. 1, 2.—Hooker & Arnott, Bot. Beechey, 394.—Endlicher, Syn. Conif. 112.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 418.

? *Abies trigona*, Rafinesque, Atlant. Jour. 119.—Endlicher, Syn. Conif. 124.—Carrière, Trait. Conif. 1 ed. 264.

? *Abies falcata*, Rafinesque, Atlant. Jour. 119.—Endlicher, Syn. Conif. 124.—Lindley & Gordon in Jour. Hort. Soc. London, v, 213.—Carrière, Trait. Conif. 268; 2 ed. 314.

*Pinus Menziesii*, var. *crispa*, Antoine, Conif. 85, t. 35, f. 2.

*Abies Sitchensis*, Lindley & Gordon in Jour. Hort. Soc. London, v, 212.—Koch, Dendrologie, ii<sup>2</sup>, 247.

*P. Menziesii*, Carrière, Man. des Pl. iv, 339; Trait. Conif. 237; 2 ed. 318.

? *Sequoia Rafinesquei*, Carrière, Trait. Conif. 2 ed. 213.

## TIDE-LAND SPRUCE.

Alaska, south to Mendocino county, California, not extending more than 50 miles inland from the coast.

A large tree of great economic value, 46 to 61 meters in height, with a trunk 2.40 to 5.19 meters in diameter; gravelly ridges and swamps, reaching its greatest development in Washington territory and Oregon near the mouth of the Columbia river, here forming a belt of nearly continuous forest growth 50 or, farther north and south, rarely more than 10 or 15 miles in width.

Wood light, soft, not strong, close, straight-grained, compact, satiny; bands of small summer cells narrow, not conspicuous, resin passages few, obscure; medullary rays numerous, rather prominent; color, light brown tinged with red, the sap-wood nearly white; specific gravity, 0.4287; ash, 0.17; largely manufactured into lumber and used for construction, interior finish, fencing, boat-building, the dunnage of vessels, cooperage, woodenware, etc.

387.—*Tsuga Canadensis*, Carrière,

Trait. Conif. 189; 2 ed. 248.—Soars in Bull. Essex Inst. xiii, 184.—Engelmann in Coulter's Bot. Gazette, vi, 224.

*Pinus Canadensis*, Linnæus, Spec. 2 ed. 1421.—Wangenheim, Amer. 39, t. 15, f. 36.—Ehrhart, Beitr. iii, 23.—Aiton, Hort. Kew. iii, 370; 2 ed. v, 320.—Michaux, Fl. Bor.-Am. ii, 206.—Lambert, Pinus, 1 ed. 50, t. 32; 2 ed. i, 56, t. 35; 3 ed. ii, 79, t. 45.—Willdenow, Spec. iv, 505; Enum. 989; Berl. Baumz. 277.—Poiret in Lamarck, Dict. vi, 521.—Persoon, Syn. ii, 579.—Pursh, Fl. Am. Sept. ii, 640.—Smith in Rees' Cycl. xxviii, No. 29.—Barton, Compend. Fl. Philadelph. ii, 182.—Nuttall, Genera, ii, 223.—Hayne, Dend. Pl. 176.—Elliott, Sk. ii, 639.—Sprengel, Syst. ii, 885.—Torrey, Compend. Fl. N. States, 359; Fl. New York, ii, 230.—Beck, Bot. 340.—Eaton, Manual, 6 ed. 264.—Darlington, Fl. Cestricea, 2 ed. 548.—Hooker, Fl. Bor.-Am. ii, 164, in part.—Eaton & Wright, Bot. 358.—Bigelow, Fl. Boston. 3 ed. 386.—Antoine, Conif. 80, t. 32, f. 3.—Endlicher, Syn. Conif. 86.—Gihoul, Arb. Resin. 46.—Darby, Bot. S. States, 515.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 428.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 211, 212, t. 23, f. 3.—Bentley & Trimmen, Med. Pl. iv, 264, t. 264.

*Pinus Americana*, Miller, Dict. 7 ed. No. 6.—Du Roi, Obs. Bot. 41; Harbk. 2 ed. ii, 151.

*Pinus Abies Americana*, Marshall, Arbustum, 103.

*Abies Canadensis*, Desfontaines, Hist. Arb. ii, 590.—Michaux f. Hist. Arb. Am. i, 138, t. 13; N. American Sylva, 3 ed. iii, 146, t. 140.—Nouveau Duhamel, v, 293, t. 83, f. 1.—Eaton, Manual, 111.—Richard, Conif. 77, t. 17, f. 2.—Audubon, Birds, t. 197.—London, Arboretum, iv, 2322 & t.—Forbes, Pinetum Woburn. 129.—Nuttall, Sylva, iii, 133; 2 ed. ii, 190.—Spach, Hist. Veg. xi, 424.—Emerson, Trees Massachusetts, 77; 2 ed. i, 92 & t.—Griffith, Med. Bot. 606.—Knight, Syn. Conif. 37.—Lindley & Gordon in Jour. Hort. Soc. London, v, 209.—Parry in Owen's Rep. 618.—Darlington, Fl. Cestricea, 3 ed. 291.—Gordon, Pinetum, 14; 2 ed. 22.—Cooper in Smithsonian Rep. 1858, 257.—Chapman, Fl. S. States, 434.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 27.—Wood, Cl. Book, 661; Bot. & Fl. 313.—Porcher, Resources S. Forests, 506.—Henkel & Hochstetter, Nadelhölz. 153 (excl. syn. *aromatica*).—Nelson, Pinaceæ, 30.—Gray, Manual N. States, 5 ed. 471.—Hoopes, Evergreens, 124, f. 23.—Koch, Dendrologie, ii<sup>2</sup>, 249.—Vasey, Cat. Forest Trees, 23.—Fl. des Serres, xxii, 203.—Guibourt, Hist. Drogues, ii, 247.—Bell in Geological Rep. Canada, 1879-'80, 51c.—Veitch, Manual Conif. 114, f. 29.

*Picea Canadensis*, Link in Linnæa, xv, 524.

HEMLOCK.

Nova Scotia, southern New Brunswick, valley of the Saint Lawrence river to the shores of lake Temiscaming, and southwest to the western borders of northern Wisconsin; south through the northern states to New Castle county, Delaware, southeastern Michigan, central Wisconsin, and along the Alleghany mountains to Clear Creek falls, Winston county, Alabama (*Mohr*).

A tree 21 to 33 meters in height, with a trunk 0.90 to 1.15 meter in diameter; dry, rocky ridges, generally facing the north and often forming extensive forests almost to the exclusion of other species, or, less commonly, borders of swamps in deep, rich soil; most common at the north, although reaching its greatest individual development in the high mountains of North Carolina and Tennessee.

Wood light, soft, not strong, brittle, coarse, crooked-grained, difficult to work, liable to wind-shake and splinter, not durable; bands of small summer cells rather broad, conspicuous; medullary rays numerous, thin; color, light brown tinged with red or often nearly white, the sap-wood somewhat darker; specific gravity, 0.4239; ash, 0.46; largely manufactured into coarse lumber and used in construction for outside finish, railway ties, etc.; two varieties, red and white, produced apparently under precisely similar conditions of growth, are recognized by lumbermen.

The bark, rich in tannin, is the principal material used in the northern states in tanning leather, and yields a fluid extract sometimes used medicinally as a powerful astringent.

Canada or hemlock pitch, prepared from the resinous secretion of this species, is used in the preparation of stimulating plasters, etc. (*U. S. Dispensatory*, 14 ed. 709, 903.—*Nat. Dispensatory*, 2 ed. 1109.—*Flickiger & Hanbury, Pharmacographia*, 552).

388.—*Tsuga Caroliniana*, Engelm.,

*Coulter's Bot. Gazette*, vi, 223.

*Abies* species, Gibbs in *Proc. Elliott Soc.* i, 286.

*Abies Caroliniana*, Chapman, *Fl. S. States*, Suppl. 650.

HEMLOCK.

Southern Alleghany region, Bluff mountain, North Carolina (*A. Gray*), "Saluda mountain," South Carolina (*J. S. Gibbs*), Pinnacle mountain, North Carolina (*Curtiss*), New river, North Carolina, and Cæsar's head, South Carolina (*Canby*), Whitesides mountain and Devil's Court-House peak, Jackson county, North Carolina (*J. Donnell Smith*).

A small tree, 12 to 15 meters in height, with a trunk 0.60 to 0.75 meter in diameter; dry, rocky ridges between 4,000 and 5,000 feet elevation; rare and local; long confounded with the closely allied *T. Canadensis*, from which it may be distinguished by its larger, glossier, blunter leaves, and larger cones with wide-spreading scales.

Wood light, soft, not strong, brittle, coarse-grained; bands of small summer cells narrow, not conspicuous; medullary rays numerous, thin; color, light brown tinged with red, the sap-wood nearly white; specific gravity, 0.4275; ash, 0.40.

389.—*Tsuga Mertensiana*, Carrière,

*Trait. Conif.* 2 ed. 250.—Engelman in *Bot. California*, ii, 121; *Coulter's Bot. Gazette*, vi, 224.—G. M. Dawson in *Canadian Nat.* new ser. ix, 324.

?*Abies heterophylla*, Rafinesque, *Atlant. Jour.* 119.—Endlicher, *Syn. Conif.* 124.—Carrière, *Trait. Conif.* 1 ed. 265.

*Pinus Mertensiana*, Bongard in *Mem. Acad. St. Petersburg*, 6 ser. iii, 163.—Hooker, *Fl. Bor.-Am.* ii, 164.—Endlicher, *Syn. Conif.* 111.—Ledebour, *Fl. Rossica*, iii, 668.—Parlatore in *De Candolle, Prodr.* xvi<sup>2</sup>, 428.—McNab in *Proc. Royal Irish Acad.* 2 ser. ii, 211, 212, t. 23, f. 4.

*Pinus Canadensis*, Bongard in *Mem. Acad. St. Petersburg*, 6 ser. iii, 163 [not Linnæus].—Douglas in *Companion Bot. Mag.* ii, 127.—Hooker, *Fl. Bor.-Am.* ii, 164, in part.—Ledebour, *Fl. Rossica*, iii, 668.

*Abies Mertensiana*, Lindley & Gordon in *Jour. Hort. Soc. London*, v, 211.—Carrière, *Trait. Conif.* 1 ed. 232.—Gordon, *Pinotum*, 18; Suppl. 12; 2 ed. 29.—Lyll in *Jour. Linnæan Soc.* vii, 133, 144.—Henkel & Hochstetter, *Nadelhölz.* 152.—Rothrock in *Smithsonian Rep.* 1867, 433.—Cooper in *Am. Nat.* iii, 412.—Gray in *Proc. Am. Acad.* vii, 402.—Heopes, *Evergreens*, 192.—Koch, *Dendrologie*, ii<sup>2</sup>, 250.—Vasey, *Cat. Forest Trees*, 33.—Macoun in *Geological Rep. Canada* 1875-'76, 211.—Hall in *Coulter's Bot. Gazette*, ii, 91.

*Abies Canadensis*,? Cooper in *Smithsonian Rep.* 1858, 262; *Pacific R. R. Rep.* xii<sup>2</sup>, 69 [not Desfontaines].

*Abies Bridgesii*, Kellogg in *Proc. California Acad.* ii, 37.

*Abies Albertiana*, Murray in Proc. Hort. Soc. London, iii, 149 & f.—Lawson, Pinetum Brit. ii, 111, t. 16, f. 1–18.—Nelson, Pinaceæ, 31.—Fowler in London Gard. Chronicle, 1872, 75.

*Abies taxifolia*, Hartweg, *ined.* (*vide* Murray in Proc. Hort. Soc. London, iii, 148).

*Pinus Pattoniana*, McNab in Proc. Royal Irish Acad. 2 ser. ii, 211, 212, t. 23, f. 2 [not Parlatores] (*vide* Engelmann in London Gard. Chronicle, 1882, 145).

*Abies Pattonii*, McNab in Jour. Linnæan Soc. xix, 308.

## HEMLOCK.

Alaska, south along the islands and coast of British Columbia, and through the Selkirk, Gold, and other interior ranges to the Bitter Root mountains of Idaho, and the western slopes of the Rocky mountains of Montana (valley of the Flathead river, *Canby & Sargent*), extending south along the Cascade mountains to southern Oregon and in the Coast ranges to Marin county, California, between 1,000 and 4,000 feet elevation.

A large tree, 30 to 61 meters in height, with a trunk 1.20 to 3 meters in diameter; low, moist bottoms or rocky ridges; very common and reaching its greatest development in western Oregon and Washington territory, often forming extensive forests, especially along the western base of the Cascade mountains.

Wood light, hard, not strong, rather close-grained; bands of small summer cells thin, not conspicuous; medullary rays numerous, prominent; color, light brown tinged with yellow, the sap-wood nearly white; specific gravity, 0.5182; ash, 0.42; occasionally manufactured into coarse lumber.

The bark, rich in tannin, is the principal material used on the northwest coast in tanning leather.

390.—*Tsuga Pattoniana*, Engelmann,

Bot. California, ii, 121; London Gard. Chronicle, 145.

*Abies Pattoniana*, Jeffrey in Rep. Oregon Exped. i, t. 4, f. 2.—Murray in Edinburgh New Phil. Jour. new ser. i, 291, t. 9, f. 1–7.—Lawson, Pinetum Brit. ii, 157, t. 22.—Gray in Proc. Am. Acad. vii, 402.—Koch, Dendrologie, ii<sup>3</sup>, 252.—Hoopes, Evergreens, 172.—Carrière, Trait. Conif. 2 ed. 30.—Hall in Coulter's Bot. Gazette, ii, 91.—Veitch, Manual Conif. 116, f. 31, 32.

? *Picea Californica*, Carrière, Trait. Conif. 261; 2 ed. 346.

*Abies Hookeriana*, Murray in Edinburgh New Phil. Jour. new ser. i, 289, t. 9, f. 11–17.—Lawson, Pinetum Brit. ii, 153, t. 21, 22, f. 1–22.—Nelson, Pinaceæ, 31.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 211, 212, t. 23, f. 1.—Veitch, Manual Conif. 115, t. 32.

*Abies Williamsonii*, Newberry in Pacific R. R. Rep. vi, 53, 90, t. 7, f. 19.—Wood, Bot. & Fl. 313.—Cooper in Am. Nat. iii, 412.—Vasey, Cat. Forest Trees, 33.

*Pinus Pattoniana*, Parlatores in De Candolle, Prodr. xvi<sup>3</sup>, 429.

*Abies Pattonii*, Gordon, Pinetum, 1 ed. 10 (excl. syn. *trigona*).

*Abies Pattoni*, Gordon, Pinetum, Suppl. 12.—Henkel & Hochstetter, Nadelhölz. 151 (excl. syn. *trigona*).

Valley of the Fraser river, British Columbia, and probably much farther north, south along the Cascade mountains and the California Sierras to the headwaters of the San Joaquin river, extending east along the high mountains of northern Washington territory to the western slopes and summits of the Cœur d'Alène and Bitter Root mountains of Idaho (Lolo trail, *Watson*), and the divide between Thompson and Little Bitter Root creeks, northern Montana (*H. B. Ayres*).

An alpine tree, rarely 30 meters in height, with a trunk 1.50 to 2.10 meters in diameter; dry slopes and ridges near the limits of tree growth, ranging from an elevation of 2,700 feet in British Columbia to 10,000 feet in the Sierras of central California.

Wood light, soft, not strong, close-grained, satiny, susceptible of a good polish; bands of small summer cells thin, not conspicuous; medullary rays numerous, obscure; color, light brown or red, the sap-wood nearly white; specific gravity, 0.4454; ash, 0.44.

391.—*Pseudotsuga Douglasii*, Carrière,

Trait. Conif. 2 ed. 256.—Engelmann in Wheeler's Rep. vi, 257; Bot. California, ii, 120.—G. M. Dawson in Canadian Nat. new ser. ix, 323.—Eichler in Monatsb. Acad. Berl. 1881, f. 18–22.—Rusby in Bull. Torrey Bot. Club, ix, 79.

*Pinus taxifolia*, Lambert, Pinus, 1 ed. i, 51, t. 33; 2 ed. i, 58, t. 36; 3 ed. ii, 82, t. 47.—Pursh, Fl. Am. Sept. ii, 640.—Smith in Rees' Cycl. xxviii, No. 28.—Sprengel, Syst. ii, 885.—Eaton, Manual, 6 ed. 264.—Eaton & Wright, Bot. 358.

*Abies taxifolia*, Poiret in Lamarek, Dict. vi, 523.—Nouveau Duhamel, v, 293.—Torrey & Gray in Pacific R. R. Rep. ii, 130.—Cooper in Smithsonian Rep. 1858, 262; Pacific R. R. Rep. xii<sup>2</sup>, 69.

*Abies Douglasii*, Lindley in Penn. Cycl. i, 32.—London, Arboretum, iv, 2319, f. 2230.—Forbes, Pinetum Woburn. 127, t. 45.—Bentham, Pl. Hartweg. 57.—Nuttall, Sylva, iii, 129, t. 115; 2 ed. ii, 187, t. 115.—Spach, Hist. Veg. xi, 423.—Knight, Syn. Conif. 37.—Lindley & Gordon in Jour. Hort. Soc. London, v, 209.—London Gard. Chronicle, 1854, 163.—Bigelow in Pacific R. R. Rep. iv, 17.—Torrey in Pacific R. R. Rep. iv, 141; Bot. Mex. Boundary Survey, 210; Ives' Rep. 28.—Newberry in Pacific R. R. Rep. vi, 54, 90, t. 8, f. 20.—Gordon, Pinetum, 15; Suppl. 10; 2 ed. 24.—Cooper in Smithsonian Rep. 1858, 262; Pacific R. R. Rep. xii<sup>2</sup>, 24, 69; Am. Nat. iii, 411.—Wood, Bot. & Fl. 313.—Engelmann in Am. Jour. Sci. 2 ser. xxxiv, 330; Proc. Am. Phil. Soc. new ser. xii, 209.—Lyall in Jour. Linnæan Soc. vii, 131, 133, 143.—Henkel & Hochstetter, Nadelhölz. 155.—Nelson, Pinaceæ, 32.—Rothrock in Smithsonian Rep. 1867, 433; Pl. Wheeler, 28, 50; Wheeler's Rep. vi, 9.—Hoope, Evergreens, 189.—Lawson, Pinetum Brit. ii, 115, t. 17, 18, f. 1–23.—Porter in Hayden's Rep. 1871, 494.—Watson in King's Rep. v, 334; Pl. Wheeler, 17.—Fowler in London Gard. Chronicle, 1872, 75.—Gray in Proc. Am. Acad. vii, 402.—Koch, Dendrologie, ii<sup>2</sup>, 255.—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 131.—Murray in London Gard. Chronicle, 1872, 106.—Vasey, Cat. Forest Trees, 33.—Hayden in Warren's Rep. Nebraska & Dakota, 2 ed. 122.—Macoun in Geological Rep. Canada, 1875–76, 211.—Hall in Coulter's Bot. Gazette, ii, 91.—Brandegge in Coulter's Bot. Gazette, iii, 32.—Veitch, Manual Conif. 119, f. 35.

*Abies mucronata*, Rafinesque, Jour. Atlant. 119.—Endlicher, Syn. Conif. 126.—Lindley & Gordon in Jour. Hort. Soc. London, v, 213.—Carrière, Trait. Conif. 268; 2 ed. 312.

? *Abies mucronata palustris*, Rafinesque, Jour. Atlant. 129.—Carrière, Trait. Conif. 268; 2 ed. 313.

*Pinus Douglasii*, Lambert, Pinus, 1 ed. iii, 163, t. 21.—Hooker, Fl. Bor.-Am. ii, 162, t. 183.—Antoine, Conif. 84, t. 33, f. 3.—Hooker & Arnott, Bot. Beechey, 394.—Endlicher, Syn. Conif. 87.—Torrey in Sitgreaves' Rep. 173.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 430.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 703, t. 49, f. 32, 32<sup>a</sup>, 32<sup>b</sup>.

*Abies Douglasii*, var. *taxifolia*, Loudon, Arboretum, iv, 2319, f. 2231.—Gordon, Pinetum, 16; 2 ed. 25.—Henkel & Hochstetter, Nadelhölz. 156.

*Pinus Douglasii*, var. *brevibracteata*, Antoine, Conif. 84, t. 33, f. 4.

*Picea Douglasii*, Link in Linnæa, xv, 524.

*Tsuga Douglasii*, Carrière, Trait. Conif. 192.—Bolander in Proc. California Acad. iii, 232.

*Tsuga Lindleyana*, Roeml, Cat. Grain Mex. 8.

## RED FIR. YELLOW FIR. OREGON PINE. DOUGLAS FIR.

Coast ranges and interior plateau of British Columbia south of latitude 55° N. (not reaching the coast archipelago north of Vancouver's island), east to the eastern slope of the Rocky mountains in latitude 51° N. (Bow River pass, Macoun); south along the mountain ranges of Washington territory, Oregon, the California Coast ranges, and the western slope of the Sierra Nevadas, through the mountain ranges east to Montana, Wyoming, Colorado, and the Guadalupe mountains of Texas; in the Wahsatch and Uintah mountains, the ranges of northern and eastern Arizona, and southward into Mexico; not detected in the interior region between the Sierra Nevada and the Wahsatch mountains, south of the Blue mountains of Oregon, and north of Arizona.

A large tree, 61 to 92 meters in height, with a trunk 0.83 to 3.66 meters in diameter, or in the Rocky mountains much smaller, here rarely 30 meters in height; the most generally-distributed and valuable timber tree of the Pacific region, growing from the sea-level to an elevation in Colorado of nearly 10,000 feet; often forming extensive forests, almost to the exclusion of other species, and reaching in western Oregon and Washington territory its greatest development and value.

Wood hard, strong, varying greatly with age and conditions of growth in density, quality, and amount of sap; difficult to work, durable; bands of small summer cells broad, occupying fully half the width of the annual growth, dark colored, conspicuous, soon becoming flinty and difficult to cut; medullary rays numerous, obscure; color, varying from light red to yellow, the sap-wood nearly white; specific gravity, 0.5157; ash, 0.08; largely manufactured into lumber and used for all kinds of construction, railway ties, piles, fuel, etc.; two varieties, red and yellow fir, are distinguished by lumbermen, dependent probably upon the age of the tree; the former coarse-grained, darker colored, and considered less valuable than yellow fir.

The bark is found valuable in tanning leather.

Var. *macrocarpa*, Engelm.,  
Bot California, ii, 120.

*Abies Douglasii*, var. *macrocarpa*, Torrey in Ives' Rep. 28.—Vasey, Cat. Forest Trees, 33.

*Abies macrocarpa*, Vasey in Gard. Monthly, Jan. 1876.

#### HEMLOCK.

California Coast ranges; San Bernardino mountains to the Cuyamaca mountains.

A tree 30 to 54 meters in height, with a trunk 1.20 to 1.80 meter in diameter; dry ridges and cañons between 2,500 and 4,000 feet elevation.

Wood heavy, hard, strong, cross-grained, very durable, difficult to work; color, rather darker red than that of the species; specific gravity, 0.4563; ash, 0.08; somewhat manufactured into coarse lumber and largely used for fuel.

#### 392.—*Abies Fraseri*, Lindley,

Penn. Cycl. i, 30.—Forbes, Pinetum Woburn. iii, t. 38.—Link in Linnæa, xv, 531.—Nuttall, Sylva, iii, 139, t. 119; 2 ed. ii, 196, t. 119.—Lindley & Gordon in Jour. Hort. Soc. London, v, 209.—Carrière, Trait. Conif. 200; 2 ed. 270.—Cooper in Smithsonian Rep. 1853, 257.—Chapman, Fl. S. States, 434.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 26.—Wood, Cl. Book, 661; Bot. & Fl. 314.—Henkel & Hochstetter, Nadelhölz. 169.—Gray, Manual N. States, 5 ed. 472, in part.—Hoopes, Evergreens, 202.—Bertrand in Bull. Soc. Bot. France, xviii, 379.—Koch, Dendrologie, ii<sup>2</sup>, 216.—Vasey, Cat. Forest Trees, 35.—Engelmann in Trans. St. Louis Acad. iii, 596; London Gard. Chronicle, 1877, 147.—Veitch, Manual Conif. 96.

*Pinus Fraseri*, Pursh, Fl. Am. Sept. ii, 639.—Smith in Rees' Cycl. xxviii, No. 27.—Poiret, Suppl. v, 35.—Sprengel, Syst. ii, 884.—Beck, Bot. 340.—Eaton, Manual, 6 ed. 264.—Lambert, Pinus, 1 ed. iii, 74, t. 42.—Eaton & Wright, Bot. 358.—Antoine, Conif. 76, t. 29, f. 1.—Endlicher, Syn. Conif. 91.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 419.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 684, t. 47, f. 10.

*A. balsamea*, var. *Fraseri*, Nuttall, Genera, ii, 223.—Spach, Hist. Veg. xi, 422.

*Pinus balsamea*, var. *Fraseri*, Torrey, Compend. Fl. N. States, 359.

*Picea Fraseri*, Loudon, Arboretum, iv, 2340, f. 2243, 2244.—Knight, Syn. Conif. 39.—Gordon, Pinetum, 148; 2 ed. 205.

#### BALSAM. SHE BALSAM.

High mountains of North Carolina and Tennessee.

A tree 18 to 24 meters in height, with a trunk sometimes 0.60 meter in diameter; moist slopes between 5,000 and 6,500 feet elevation, often forming considerable forests.

Wood very light, soft, not strong, coarse-grained, compact; bands of small summer cells rather broad, light colored, not conspicuous; medullary rays numerous, thin; color, light brown, the sap-wood lighter, nearly white; specific gravity, 0.3565; ash, 0.54.

#### 393.—*Abies balsamea*, Miller,

Dict. No. 5.—Desfontaines, Hist. Arb. ii, 579.—Nouveau Duhamel, v, 295, t. 83, f. 2.—Richard, Conif. 74, t. 16.—Lindley, Penn. Cycl. i, 30; Fl. Med. 554.—Forbes, Pinetum Woburn. 109, t. 37.—Link in Linnæa, xv, 530.—Spach, Hist. Veg. xi, 421.—Griffith, Med. Bot. 606, f. 268.—Lindley & Gordon in Jour. Hort. Soc. London, v, 210.—Carrière, Trait. Conif. 217; 2 ed. 292.—Richardson, Arctic Exped. 441.—Darlington, Fl. Cestrica, 3 ed. 291.—Cooper in Smithsonian Rep. 1853, 257.—Wood, Cl. Book, 661; Bot. & Fl. 314.—Porcher, Resources S. Forests, 506.—Henkel & Hochstetter, Nadelhölz. 176.—Gray, Manual N. States, 5 ed. 471.—Hoopes, Evergreens, 197.—Bertrand in Bull. Soc. Bot. France, xviii, 379.—Koch, Dendrologie, ii<sup>2</sup>, 214.—Vasey, Cat. Forest Trees, 34.—Guibourt, Hist. Drogues, 7 ed. ii, 246.—Engelmann in Trans. St. Louis Acad. iii, 597.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Sears in Bull. Essex Inst. xiii, 184.—Bell in Geological Rep. Canada, 1879-'80, 46c.—Veitch, Manual Conif. 88.

*Pinus balsamea*, Linnæus, Spec. 1 ed. 1002.—Wangenheim, Amer. 40.—Aiton, Hort. Kew. iii, 370; 2 ed. v, 319.—Mönch, Meth. 364.—Du Roi, Harbk. 2 ed. 144.—Lambert, Pinus, 1 ed. i, 48, t. 31; 2 ed. i, 52, t. 33; 3 ed. i, 72, t. 41.—Willdenow, Spec. iv, 504; Enum. 989; Berl. Baumz. 276.—Persoon, Syn. ii, 579.—Pursh, Fl. Am. Sept. ii, 639.—Eaton, Manual, 111; 6 ed. 264.—Nuttall, Genera, ii, 223.—Hayne, Dend. Fl. 176.—Elliott, Sk. ii, 639.—Sprengel, Syst. ii, 884.—Torrey, Compend. Fl. N. States, 359; Fl. N. York, ii, 229.—Descourtilz, Fl. Med. Antilles, iv, 59, t. 246.—Woodville, Med. Bot. 3 ed. v, 1, t. 1.—Beck, Bot. 340.—Hooker, Fl. Bor.-Am. ii, 163.—Eaton & Wright, Bot. 358.—Bigelow, Fl. Boston. 3 ed. 385.—Antoine, Conif. 66, t. 26, f. 3.—Endlicher, Syn. Conif. 103.—Gihoul, Arb. Resin. 45.—Darby, Bot. S. States, 515.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 423.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 684, t. 47, f. 11.—Bentley & Trimen, Med. Pl. iv, 263, t. 263.

*Pinus Abies Balsamea*, Marshall, Arbustum, 102.

*A. balsamifera*, Michaux, Fl. Bor.-Am. ii, 207, in part.—Michaux f. Hist. Arb. Am. i, 145, t. 14; N. American Sylva, 3 ed. iii, 150, t. 150, in part.

*Picea balsamea*, Loudon, Arboretum, iv, 2339, f. 2240, 2241.—Knight, Syn. Conif. 39.—Gordon, Pinetum, 143; 2 ed. 200.—Henkel & Hochstetter, Nadelhölz. 176.—Emerson, Trees Massachusetts, 85; 2 ed. i, 101.—Nelson, Pinaceæ, 37.

*Picea balsamea*, var. *longifolia*, Hort.—Loudon, Arboretum, iv, 2339.

*Picea Fraseri*, Emerson, Trees Massachusetts, 88; 2 ed. i, 104 [not Loudon].

BALSAM FIR. BALM OF GILEAD FIR.

Northern Newfoundland and Labrador to the southern shores of Hudson bay, northwest to the Great Bear lake and the eastern base of the Rocky mountains; south through the northern states to Pennsylvania, central Michigan and Minnesota, and along the Alleghany mountains to the high peaks of Virginia.

A tree 21 to 27 meters in height, with a trunk rarely exceeding 0.60 meter in diameter, or at high elevations reduced to a low, prostrate shrub (*A. Hudsonica*, Hort.); damp woods and mountain swamps.

Wood very light, soft, not strong, coarse-grained, compact, not durable; bands of small summer cells not broad, resinous, conspicuous; medullary rays numerous, obscure; color, light brown, often streaked with yellow, the sap-wood lighter; specific gravity, 0.3819; ash, 0.45.

Canadian balsam or balm of fir, an aromatic liquid oleo-resin obtained from this and other species of *Abies* by puncturing the vesicles formed under the bark of the stem and branches, is used medicinally, chiefly in the treatment of chronic catarrhal affections, and in the arts (*U. S. Dispensatory*, 14 ed. 898, 900.—*Nat. Dispensatory*, 2 ed. 1417.—*Fückiger & Hanbury, Pharmacographia*, 552).

394.—*Abies subalpina*, Engelmann,

Am. Nat. x, 554; Trans. St. Louis Acad. iii, 597; Wheeler's Rep. vi, 255.—Vasey, Cat. Forest Trees, 34.—Hall in Coulter's Bot. Gazette, ii, 91.—Brandege in Coulter's Bot. Gazette, iii, 32.—G. M. Dawson in Canadian Nat. newser. ix, 326.—Masters in London Gard. Chronicle, 1881, 236, f. 43, 44, 45.

?*Pinus lasiocarpa*, Hooker, Fl. Bor.-Am. ii, 163 [not Hort.].—Endlicher, Syn. Conif. 105.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 682, t. 46, f. 7, 7<sup>a</sup>; t. 47, 48, 49 (excl. syn.).

?*A. lasiocarpa*, Nuttall, Sylva, iii, 138; 2 ed. ii, 195.—Lindley & Gordon in Jour. Hort. Soc. London, v, 210.—Carrière, Trait. Conif. 1 ed. 221.—Cooper in Smithsonian Rep. 1858, 262.—Murray in Proc. Hort. Soc. London, iii, 313, f. 27-31.—Henkel & Hochstetter, Nadelhölz. 161 (excl. syn.).

?*Pinus* species, Torrey in Fremont's Rep. 97.

*Picea amabilis*, Gordon, Pinetum, 154, in part; 2 ed. 213, in part.

*A. bifolia*, Murray in Proc. Hort. Soc. London, iii, 320, f. 51-56; London Gard. Chronicle, 1875, 465, f. 96, 97.—Regei, Gartenflora, xiii, 119.—Henkel & Hochstetter, Nadelhölz. 420.

*A. grandis*, Engelmann in Am. Jour. Sci. 2 ser. xxxiv, 310 [not Lindley].—Carrière, Trait. Conif. 2 ed. 296, in part.—Watson in King's Rep. v, 334, in part.—Gray in Proc. Am. Acad. vii, 402 [not Lindley].—Porter & Coulter, Fl. Colorado; Hayden's Surv. Misc. Pub. No. 4, 131 [not Lindley].

*Pinus amabilis*, Parlatores in De Candolle, Prodr. xvi<sup>3</sup>, 426, in part.

*Picea bifolia*, Murray in London Gard. Chronicle, 1875, 105.

*A. subalpina*, var. *fallax*, Engelmann in Trans. St. Louis Acad. iii, 597.

BALSAM.

Valley of the Stakhin river, Alaska, in latitude 60° N. (*Muir*), south through British Columbia and along the Cascade mountains to northern Oregon (*Collier*), through the Blue mountains of Oregon and the ranges of Idaho, Montana, Wyoming, Utah, and Colorado.

A tree 24 to 40 meters in height, with a trunk rarely exceeding 0.60 meter in diameter; mountain slopes and cañons between 4,000 (British Columbia) and 12,000 (Colorado) feet elevation; generally scattered and rarely forming the prevailing forest growth.

Wood very light, soft, not strong, rather close-grained, compact; bands of small summer cells very narrow, not conspicuous; medullary rays numerous, obscure; color, light brown or nearly white, the sap-wood lighter; specific gravity, 0.3476; ash, 0.44.

395.—*Abies grandis*, Lindley,

Penn. Cycl. i, 30.—Forbes, Pinetum Woburn. 123, t. 43.—Spach, Hist. Veg. xi, 422.—Nuttall, Sylva, iii, 134; 2 ed. ii, 192.—Lindley & Gordon in Jour. Hort. Soc. London, v, 210.—Carrière, Trait. Conif. 220; 2 ed. 296 (excl. syn.).—Cooper in Smithsonian Rep. 1858, 262; Pacific R. R. Rep. xii<sup>3</sup>, 25, 69; Am. Nat. iii, 410.—Wood, Bot. & Fl. 314.—Lyal in Jour. Linnæan Soc. vii, 143.—Bolander in Proc. California Acad. iii, 232.—Henkel & Hochstetter, Nadelhölz. 160.—Nelson, Pinaceæ, 38.—Hoopes, Evergreens, 211.—Bertrand in Bull. Soc. Bot. France, xviii, 378.—Vasey, Cat. Forest Trees, 34.—Hall in Coulter's Bot. Gazette, ii, 91.—Macoun in Geological Rep. Canada, 1875-76, 211.—Engelmann in Trans. St. Louis Acad. iii, 593; London Gard. Chronicle, 1879, 684; 1880, 660, f. 119; Bot. California, ii, 118.—G. M. Dawson in Canadian Nat. new ser. ix, 326.—Masters in London Gard. Chronicle, 1881, 179, f. 33-36.—Veitch, Manual Conif. 97, f. 23, 24.

*Pinus grandis*, Douglas in Companion Bot. Mag. ii, 147.—Hooker, Fl. Bor.-Am. ii, 163.—Antoine, Conif. 63, t. 25, f. 1.—Hooker & Arnott, Bot. Beechey, 394.—Endlicher, Syn. Conif. 105.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 427 (excl. syn.).—McNab in Proc. Royal Irish Acad. 2 ser. ii, 678, t. 46, f. 4, 4<sup>a</sup>.

?*A. aromatica*, Rafinesque, Atlant. Jour. 119.—Endlicher, Syn. Conif. 125.—Lindley & Gordon in Jour. Hort. Soc. London, v, 213.—Carrière, Trait. Conif. 266; 2 ed. 310.

*Picea grandis*, London, Arboretum, iv, 2341, f. 2245, 2246, in part.—Knight, Syn. Conif. 39.—Gordon, Pinetum, 155; Suppl. 5 (excl. syn. *Parsonsii*); 2 ed. 216.—Newberry in Pacific R. R. Rep. vi, 46, 90, f. 16, t. 6, in part.—Murray in London Gard. Chronicle, 1875, 135, f. 28.

*A. Gordoniana*, Carrière, Trait. Conif. 2 ed. 298 (excl. syn. *Parsonsii*).—Bertrand in Bull. Soc. Bot. France, xviii, 379.

*A. amabilis*, Murray in Proc. Hort. Soc. London, iii, 310, f. 22-24 [not Forbes].

## WHITE FIR.

Vancouver's island, south to Mendocino county, California, near the coast; interior valleys of western Washington territory and Oregon south to the Umpqua river, Cascade mountains below 4,000 feet elevation, through the Blue mountains of Oregon (*Ousick*) to the eastern slope of the Cœur d'Alène mountains (*Cooper*), the Bitter Root mountains, Idaho (*Watson*), and the western slopes of the Rocky mountains of northern Montana (Flathead region, *Canby & Sargent*).

A large tree, 61 to 92 meters in height, with a trunk 0.90 to 1.50 meter in diameter; most common and reaching its greatest development in the bottom lands of western Washington territory and Oregon in rich, moist soil; or moist mountain slopes, then much smaller, rarely exceeding 30 meters in height.

Wood very light, soft, not strong, coarse-grained, compact; bands of small summer cells broader than in other American species, dark colored, resinous, conspicuous; medullary rays numerous, obscure; color, light brown, the sap-wood rather lighter; specific gravity, 0.3545; ash, 0.49; in western Oregon manufactured into lumber and used for interior finish, packing-cases, cooperage, etc.

396.—*Abies concolor*, Lindley & Gordon,

Jour. Hort. Soc. London, v, 210.—Parry in Am. Nat. ix, 204.—Vasey, Cat. Forest Trees, 34.—Engelmann in Trans. St. Louis Acad. iii, 600; Wheeler's Rep. vi, 255; London Gard. Chronicle, 1879, 684, f. 114, 115; Bot. California, ii, 118.—Brandege in Coulter's Bot. Gazette, iii, 32.—Masters in London Gard. Chronicle, 1879, 684, f. 114, 115.—Veitch, Manual Conif. 93.

*Pinus concolor*, Engelmann in herb.; Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 426.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 681, t. 46, f. 6.

*Picea concolor*, Gordon, Pinetum, 155; 2 ed. 216.—Murray in London Gard. Chronicle, 1875, 135, f. 26.

*Pinus lasiocarpa*, Balfour in Rep. Oregon Exped. i, t. 4, f. 1 [not Hooker].—Murray in Proc. Hort. Soc. London, iii, 314, f. 25.—Henkel & Hochstetter, Nadelhölz. 429.

?*A. balsamea*, Bigelow in Pacific R. R. Rep. iv, 18 [not Miller].—Torrey in Pacific R. R. Rep. iv, 141.

*Picea grandis*, Newberry in Pacific R. R. Rep. vi, 46, in part.

*Abies grandis*, Carrière, Trait. Conif.; 2 ed. 296, in part.—Watson in Pl. Wheeler, 17 [not Lindley].

*Picea Lowiana*, Gordon, Pinetum, Suppl. 53; 2 ed. 218.—Henkel & Hochstetter, Nadelhölz. 419.

*A. Lowiana*, Murray in Proc. Hort. Soc. London, iii, 317, f. 38-41.

*A. amabilis*, Watson in King's Rep. v, 333 [not Forbes].

*A. grandis*, var. *Lowiana*, Hoopes, Evergreens, 212.

*Pinus grandis*, Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 427, in part.

*Picea concolor*, var. *violacea*, Murray in London Gard. Chronicle, 1875, 464, f. 94, 95.

*Pinus Lowiana*, McNab in Proc. Royal Irish Acad. 2 ser. ii, 680, t. 46, f. 5.

*A. lasiocarpa*, Hort. [not Nuttall].

*A. Parsonsii*, Hort.

## WHITE FIR. BALSAM FIR.

Northern slopes of the Siskiyou mountains, Oregon, and perhaps farther north in the Cascade mountains, south along the western slope of the Sierra Nevadas to the San Bernardino and San Jacinto mountains, California; along the high mountains of northern Arizona to the Mogollon mountains, New Mexico, northward to the Pike's Peak region of Colorado, and in the Wahsatch mountains of Utah.

A large tree, 30 to 40 meters in height, with a trunk 1.20 to 1.50 meter in diameter; moist slopes and cañons between 3,000 and 9,000 feet elevation, reaching its greatest development in the California sierras, varying greatly in the color and length of leaves, habit, etc., and perhaps merely a southern form of the too nearly allied *A. grandis*, from which it cannot be always readily distinguished.

Wood very light, soft, not strong, coarse-grained, compact; bands of small summer cells narrow, resinous, not conspicuous; medullary rays, numerous, obscure; color, very light brown or nearly white, the sap-wood somewhat darker; specific gravity, 0.3638; ash, 0.85; occasionally manufactured into lumber and used for packing-cases, butter-tubs, and other domestic purposes.

397.—*Abies bracteata*, Nuttall,

*Sylva*, iii, 137, t. 118; 2 ed. ii, t. 118.—Hartweg in Jour. Hort. Soc. London, iii, 225.—Lindley & Gordon in Jour. Hort. Soc. London, v, 209.—Carrière, Trait. Conif. 196; 2 ed. 265.—London Gard. Chronicle, 1853, 435; 1854, 459; 1859, 928.—Bot. Mag. t. 4740.—Lemaire in Ill. Hort. i, 14, t. 5.—Fl. des Serres, ix, 109 & t.—Naudin in Rev. Hort. 1854, 31.—Cooper in Smithsonian Rep. 1858, 262.—Murray in Edinburgh New Phil. Jour. new ser. x, 1, t. 1, 2 (Trans. Bot. Soc. Edinburgh, vi, 211, t. 1, 2).—Henkel & Hochstetter, Nadelhölz. 167.—Hoopes, Evergreens, 199.—Bertrand in Bull. Soc. Bot. France, xviii, 379.—Vasey, Cat. Forest Trees, 35.—Engelmann in Trans. St. Louis Acad. iii, 601; London Gard. Chronicle, 1879, 684; Bot. California, ii, 118.—Veitch, Manual Conif. 89, f. 14, 15.

*Pinus venusta*, Douglas in Companion Bot. Mag. ii, 152.

*Pinus bracteata*, D. Don in Trans. Linnæan Soc. xvii, 443.—Lambert, Pinus, 1 ed. iii, 169, t. 91.—Antoine, Conif. 77, t. 30.—Hooker & Arnott, Bot. Beechey, 394.—Hooker, Icon. t. 379.—Endlicher, Syn. Conif. 89.—Walpers, Ann. v, 798.—Parlatore in De Candolle, Prodr. xvi<sup>3</sup>, 419.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 674, t. 46, f. 1.

*Picea bracteata*, London, Arboretum, iv, 2348, f. 2256.—Gordon, Pinetum, 145; 2 ed. 202.—Lawson, Pinetum Brit. ii, 171, t. 25, 26, f. 1-7.—Nelson, Pinaceæ, 37.—Fowler in London Gard. Chronicle, 1872, 286.

*A. venusta*, Koch, Dendrologie, ii<sup>2</sup>, 210.

Santa Lucia mountains, California, from the northern boundary of San Luis Obispo county about 40 miles northward.

A tree 46 to 61 meters in height, with a trunk 0.90 to 1.20 meter in diameter; moist, cold soil, occupying 4 or 5 cañons between 3,000 and 6,000 feet elevation, generally west of the summit of the range (*G. R. Vasey*).

Wood heavy, not hard, coarse-grained, compact; bands of small summer cells broad, resinous, conspicuous; medullary rays numerous, obscure; color, light brown tinged with yellow, the sap-wood not seen; specific gravity, 0.6783; ash, 2.04; probably more valuable than the wood of the other North American *Abies*.

398.—*Abies amabilis*, Forbes,

Pinetum Woburn. 125, t. 44.—Lindley & Gordon in Jour. Hort. Soc. London, v, 210.—Carrière, Trait. Conif. 219; 2 ed. 296.—Cooper in Smithsonian Rep. 1858, 262.—Lyll in Jour. Hort. Soc. London, vii, 143.—Henkel & Hochstetter, Nadelhölz. 159.—Nelson, Pinaceæ, 36.—Hoopes, Evergreens, 209 (excl. syn. *lasiocarpa*).—Fowler in London Gard. Chronicle, 1872, 235.—Koch, Dendrologie, ii<sup>2</sup>, 211 (excl. syn. *lasiocarpa*).—Macoun in Geological Rep. Canada, 1875-'76, 211.—Engelmann in London Gard. Chronicle, 1880, 720, f. 136-141; Coulter's Bot. Gazette, vii, 4.—Veitch, Manual Conif. 86.

*Pinus amabilis*, Douglas in Companion Bot. Mag. ii, 93.—Antoine, Conif. 63, t. 25, f. 2.—Hooker & Arnott, Bot. Beechey, 394.—Endlicher, Syn. Conif. 104.—Parlatore in De Candolle, Prodr. xvi<sup>3</sup>, 426, in part.

*Pinus grandis*, Lambert, Pinus, 1 ed. iii, t. 26 [not Douglas].

*Picea amabilis*, London, Arboretum, iv, 2342, f. 2247, 2248.—Knight, Syn. Conif. 39.—Gordon, Pinetum, 154; 2 ed. 213 (excl. syn.).—Newberry in Pacific R. R. Rep. vi, 51, 90, f. 18.

*A. grandis*, Murray in Proc. Hort. Soc. London, iii, 308, f. 18-21 [not Lindley].

*A. grandis*, var. *densiflora*, Engelmann in Trans. St. Louis Acad. iv, 599.

Valley of the Fraser river, British Columbia (*Engelmann & Sargent*), and probably farther north, south along the Cascade mountains of Washington territory and Oregon.

A tree 30 to 45 meters in height, with a trunk sometimes 1.20 meter in diameter, forming extensive forests on the mountains of British Columbia, between 3,500 and 5,000 feet, and upon the mountains south of the Columbia river between 3,000 and 4,000 feet elevation, here reaching its greatest development; its northern range not yet determined.

Wood light, hard, not strong, close-grained, compact; bands of small summer cells broad, resinous, dark colored, conspicuous; medullary rays numerous, thin; color, light brown, the sap-wood nearly white; specific gravity, 0.4228; ash, 0.23.

399.—*Abies nobilis*, Lindley.

Penn. Cycl. i, 30.—Forbes, Pinetum Woburn. 115, t. 40.—Link in Linnæa, xv, 532.—Spach, Hist. Veg. xi, 419.—Nuttall, Sylva, iii, 136, t. 117; 2 ed. ii, 193, t. 117.—Lindley & Gordon in Jour. Hort. Soc. London, v, 209.—Carrière, Trait. Conif. 198; 2 ed. 268.—Jour. Bot. & Kew Gard. Misc. ix, 85.—Cooper in Smithsonian Rep. 1858, 262.—Henkel & Hochstetter, Nadelhölz. 168.—Hoopes, Evergreens, 203.—Koch, Dendrologie, ii<sup>2</sup>, 209.—Vasey, Cat. Forest Trees, 34.—Engelmann in Trans. St. Louis Acad. iii, 601, in part; London Gard. Chronicle, 1879, 885; Bot. California, ii, 119, in part; Coulter's Bot. Gazette, vii, 4.—Veitch, Manual Conif. 101.

*Pinus nobilis*, Douglas in Companion Bot. Mag. ii, 147.—Lambert, Pinus, 1 ed. iii, 167, t. 74.—Hooker, Fl. Bor.-Am. ii, 162.—Antoine, Conif. 77, t. 29, f. 2.—Hooker & Arnott, Bot. Beechey, 394.—Endlicher, Syn. Conif. 90.

*Picea nobilis*, Loudon, Arboretum, iv, 2342, f. 2249, 2250.—Knight, Syn. Conif. 39.—Lindley & Gordon in Jour. Hort. Soc. London, v, 209.—Gordon, Pinetum, 149; Suppl. 48; 2 ed. 207.—Newberry in Pacific R. R. Rep. vi, 49, 90, f. 17.—Lawson, Pinetum, Brit. ii, 181, t. 28, 29, f. 1-18.—Nelson, Pinacæ, 39.

*Pseudotsuga nobilis*, Bertrand in Bull. Soc. Bot. France, xviii, 86.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 699, t. 49, f. 29, 29<sup>a</sup>.

*A. magnifica*, Engelmann in Bot. California, ii, 119, in part.

## RED FIR.

Oregon, Cascade mountains from the Columbia river south to the valley of the upper Rogue river, and along the summits of the Coast Range from the Columbia to the Nestucca river (*Collier*).

A large tree, 61 to 92 meters in height, with a trunk 2.40 to 3 meters in diameter, forming, with *A. amabilis*, extensive forests along the slopes of the Cascade Range, between 3,000 and 4,000 feet elevation; less multiplied in the coast ranges, here reaching its greatest individual development.

Wood light, hard, strong, rather close-grained, compact; bands of small summer cells broad, resinous, dark colored, conspicuous; medullary rays thin, hardly distinguishable; color, light brown streaked with red, the sap-wood a little darker; specific gravity, 0.4561; ash, 0.34.

400.—*Abies magnifica*, Murray,

Proc. Hort. Soc. London, iii, 318, f. 42-50; London Gard. Chronicle, 1875, 134.—Regel, Gartenflora, xiii, 119.—Henkel & Hochstetter, Nadelhölz. 419.—Koch, Dendrologie, ii<sup>2</sup>, 213.—Engelmann in Trans. St. Louis Acad. iii, 601; London Gard. Chronicle, 1879, 885, f. 116; Bot. California, ii, 119; Coulter's Bot. Gazette, vii, 4.—Veitch, Manual Conif. 99.

*A. campylocarpa*, Murray in Trans. Bot. Soc. Edinburgh, vi, 370.

*A. nobilis robusta*, Hort.—Carrière, Trait. Conif. 2 ed. 269.

*Picea magnifica*, Gordon, Pinetum, 2 ed. 219.—Murray in London Gard. Chronicle, 1875, 105.

*Pinus amabilis*, Parlature in De Candolle, Prodr. xvi<sup>2</sup>, 426, in part.—McNab in Proc. Royal Irish Acad. 2 ser. ii, 677, t. 46, f. 3, 3<sup>a</sup>?

*A. amabilis*, Vasey, Cat. Forest Trées, 34 [not Forbes].

*Pseudotsuga magnifica*, McNab in Proc. Royal Irish Acad. 2 ser. ii, 700, t. 49, f. 30, 30<sup>a</sup>.

*A. nobilis*, Engelmann, Bot. California, ii, 119, in part.

## RED FIR.

California, mount Shasta, south along the western slope of the Sierra Nevada to Kern county.

A large tree, 61 to 76 meters in height, with a trunk 2.40 to 3 meters in diameter, forming about the base of mount Shasta extensive forests between 4,900 and 8,000 feet elevation; farther south less common and reaching an extreme elevation of 10,000 feet.

Wood light, soft, not strong, rather close-grained, compact, satiny, durable in contact with the soil, liable to twist and warp in seasoning; bands of small summer cells broad, resinous, dark colored, conspicuous; medullary rays numerous, thin; color, light red, the sap-wood somewhat darker; specific gravity, 0.4701; ash, 0.30; largely used for fuel and occasionally manufactured into coarse lumber.

401.—*Larix Americana*, Michaux,

Fl. Bor.-Am. ii, 203.—Michaux f. Hist. Arb. Am. iii, 37, t. 4; N. American Sylva, 3 ed. iii, 167, t. 153.—Audubon, Birds, t. 4.—Loudon, Arboretum, iv, 2399.—Emerson, Trees Massachusetts, 89; 2 ed. i, 105 & t.—Gihoul, Arb. Resin. 51.—Parry in Owen's Rep. 618.—Richardson, Arctic. Exped. 442.—Cooper in Smithsonian Rep. 1858, 257.—Hooker f. in Trans. Linnæan Soc. xxiii, 302.—Wood, Cl. Book, 662; Bot. & Fl. 314.—Nelson, Pinaceæ, 86.—Gray, Manual N. States, 5 ed. 442.—Hoopes, Evergreens, 247.—Regel, Gartenflora, xx, 105, t. 684, f. 7, 8 (Belg. Hort. xxii, 105, t. 10, f. 2, 3).—Bertrand in Ann. Sci. Nat. 5 ser. xx, 90.—Vasey, Cat. Forest Trees, 35.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Sears in Bull. Essex Inst. xiii, 185.

*Pinus laricina*, Du Roi, Obs. Bot. 49; Harbk. ii, 83.—Wangenheim, Amer. 42, t. 16, f. 37.—Mœnch, Meth. 364.

*Pinus Larix rubra, alba* and *nigra*, Marshall, Arbustum, 103, 104.

*Pinus intermedia*, Wangenheim, Amer. 42, t. 16, f. 37.—Du Roi, Harbk. 2 ed. ii, 114.

*Pinus pendula*, Aiton, Hort. Kew, iii, 369; 2 ed. v, 320.—Lambert, Pinus, 1 ed. i, 55, t. 36; 2 ed. ii, 63, t. 39; 3 ed. ii, 86, t. 49.—Willdenow, Spec. iv, 502.—Persoon, Syn. ii, 579.—Pursh, Fl. Am. Sept. ii, 645.—Smith in Rees' Cycl. xxviii, No. 32.—Eaton, Manual, 110; 6 ed. 365.—Nuttall, Genera, ii, 223.—Sprengel, Syst. ii, 887.—Audubon, Birds, t. 90, 180.—Beck, Bot. 339.—Hooker, Fl. Bor.-Am. ii, 164.—Eaton & Wright, Bot. 359.—Torrey, Fl. N. York, ii, 232.—Parlatore in De Candolle, Prodr. xvi<sup>2</sup>, 409.

*Pinus microcarpa*, Lambert, Pinus, 1 ed. i, 56, t. 37; 2 ed. ii, 65, t. 40; 3 ed. ii, 88, t. 50.—Willdenow, Spec. iv, 502; Enum. 989; Berl. Baumz. 273.—Persoon, Syn. ii, 579.—Aiton, Hort. Kew. 2 ed. v, 321.—Pursh, Fl. Am. Sept. ii, 645.—Smith in Rees' Cycl. xxviii, No. 33.—Eaton, Manual, 110; 6 ed. 365.—Nuttall, Genera, ii, 223.—Hayne, Dend. Fl. 175.—Sprengel, Syst. ii, 887.—Torrey, Compend. Fl. N. States, 360.—Meyer, Fl. Labrador, 30.—Beck, Bot. 340.—Hooker, Fl. Bor.-Am. ii, 164.—Eaton & Wright, Bot. 359.—Bigelow, Fl. Boston. 3 ed. 387.—Antoine, Conif. 54, t. 21, f. 1.—Endlicher, Syn. Conif. 132.

*Abies pendula*, Poirer in Lamarck, Dict. vi, 514.—Nouveau Duhamel, v, 288.—Lindley & Gordon in Jour. Hort. Soc. London, v, 213.

*Abies microcarpa*, Poirer in Lamarck, Dict. vi, 514.—Nouveau Duhamel, v, 289, t. 79, f. 2.—Lindley in Penn. Cycl. i, 33.—Lindley & Gordon in Jour. Hort. Soc. London, 213.

*L. tenuifolia*, Salisbury in Trans. Linnæan Soc. viii, 313.

*L. pendula*, Salisbury in Trans. Linnæan Soc. viii, 313.—Forbes, Pinetum Woburn. 137, t. 46.—Carrière, Trait. Conif. 1 ed. 272.—Gordon, Pinetum, 129; 2 ed. 177.—Hooker f. in Trans. Linnæan Soc. xxiii, 302.

*L. microcarpa*, Desfontaines, Hist. Arb. ii, 597.—Forbes, Pinetum Woburn. 139, t. 47.—Spach, Hist. Veg. xi, 436.—Link in Linnæa, xv, 536.—Carrière, Trait. Conif. 275; 2 ed. 355.—Gordon, Pinetum, 129; 2 ed. 175.—Henkel & Hochstetter, Nadelhölz. 137.—Hooker f. in Trans. Linnæan Soc. xxiii, 302, 341.—Veitch, Manual Conif. 180.

*L. intermedia*, Loddiges, Cat. ed. 1836, 50.—Forbes, Pinetum Woburn. 141.—Link in Linnæa, xv, 535.

*L. Americana rubra*, Loudon, Arboretum, iv, 2400.—Knight, Syn. Conif. 40.

*L. Americana*, var. *pendula*, Loudon, Arboretum, iv, 2400.—Carrière, Trait. Conif. 2 ed. 356.

*L. Americana*, var. *prolifera*, Loudon, Arboretum, iv, 2401.—Carrière, Trait. Conif. 2 ed. 356.

*L. decidua*, var. *Americana*, Henkel & Hochstetter, Nadelhölz. 133.

## LARCH. BLACK LARCH. TAMARACK. HACKMATAACK.

Northern Newfoundland and Labrador to the eastern shores of Hudson bay, cape Churchill and northwest to the northern shores of the Great Bear lake and the valley of the Mackenzie river within the Arctic circle; south through the northern states to northern Pennsylvania, northern Indiana and Illinois, and central Minnesota.

A tree 24 to 30 meters in height, with a trunk 0.60 to 0.90 meter in diameter; moist uplands and intervalle lands, or south of the boundary of the United States in cold, wet swamps, often covering extensive areas, here much smaller and less valuable.

Wood heavy, hard, very strong, rather coarse-grained, compact, durable in contact with the soil; bands of small summer cells broad, very resinous, dark colored, conspicuous, resin passages few, obscure; medullary rays numerous, hardly distinguishable, color, light brown, the sap-wood nearly white; specific gravity, 0.6236; ash, 0.33; preferred and largely used for the upper knees of vessels, for ship timbers, fence posts, telegraph poles, railway ties, etc.

The inner bark of the closely-allied European larch is recommended in the treatment of chronic catarrhal affections of the pulmonary and urinary passages; probably that of the American species would be equally efficacious.

402.—*Larix occidentalis*, Nuttall,

*Sylva*, iii, 143, t. 120; 2 ed. ii, 199, t. 120.—Newberry in Pacific R. R. Rep. vi, 59, f. 24, 25.—Cooper in Smithsonian Rep. 1858, 262; Am. Nat. iii, 412.—Lyll in Jour. Linnæan Soc. vii, 143.—Nelson, Pinaceæ, 91.—Hoopes, Evergreens, 253.—Regel, Gartenflora, xx, 103, t. 685, f. 8-10 (Belg. Hort. xxii, 101, t. 8, f. 3-5).—Vasey, Cat. Forest Trees, 35.—Gordon, Pinetum, 2 ed. 176.—Macoun in Geological Rep. Canada, 1875-'76, 211.—G. M. Dawson in Canadian Nat. new ser. ix, 329.—Veitch, Manual Conif. 130.

*Pinus Larix*, Douglas in Companion Bot. Mag. ii, 109 [not Linnaeus].

*L. Americana*, var. *brevifolia*, Carrière, Trait. Conif. 2 ed. 357.

*Pinus Nuttallii*, Parlatores in De Candolle, Prodr. xvi<sup>2</sup>, 412.

## TAMARACK.

British Columbia, Selkirk and Gold ranges, south of latitude 53° N., extending west to the head of Okanagan lake (*G. M. Dawson*), south along the eastern slopes of the Cascade mountains to the Columbia river, through the mountain ranges of northern Washington territory to the western slopes of the Rocky mountains of Montana, and in the Blue mountains of Washington territory and Oregon.

A noble tree of great economic value, 30 to 45 meters in height, with a trunk 0.90 to 1.50 meter in diameter; moist mountain slopes and benches between 2,500 and 5,000 feet elevation; scattered among other trees and never exclusively forming forests; the thick bark long resisting the action of forest fires; very common, and perhaps reaching its greatest development in the region north of the Big Blackfoot river and in the valley of the Flathead river, Montana, here the largest and most valuable timber tree.

Wood heavy, exceedingly hard and strong, rather coarse-grained, compact, satiny, susceptible of a fine polish, very durable in contact with the soil; bands of small summer cells broad, occupying fully half the width of annual growth, very resinous, dark colored, conspicuous, resin passages few, obscure; medullary rays numerous, thin; color, light bright red, the thin sap-wood nearly white; specific gravity, 0.7407; ash, 0.09; occasionally manufactured into lumber, but principally used for fuel, posts, railway ties, etc.

403.—*Larix Lyallii*, Parlatores,

Enum. Sem. Hort. Reg. Mus. Flor. 1863; London Gard. Chronicle, 1863, 916 (Regel, Gartenflora, xiii, 244).—Lyll in Jour. Linnæan Soc. vii, 143.—Henkel & Hochstetter, Nadelhölz. 417.—Carrière, Trait. Conif. 2 ed. 361.—Hoopes, Evergreens, 256.—Regel, Gartenflora, xx, 103, t. 685, f. 11-13 (Belg. Hort. xxii, 102, t. 9, f. 1-3).—Bertrand in Ann. Sci. Nat. 5 ser. xx, 90.—Vasey, Cat. Forest Trees, 35.—Macoun in Geological Rep. Canada, 1875-'76, 211.—Veitch, Manual Conif. 130.

*Pinus Lyallii*, Parlatores in De Candolle, Prodr. xvi<sup>2</sup>, 412.

"Cascade mountains, 6,500 to 7,000 feet, forming an open belt of trees mingled with *P. flexilis* (*P. albicaulis*); on the Galton range at 6,000 feet and in the Rocky mountains at 7,000 feet, growing with *P. flexilis*" (*Lyll*); mount Stewart, Washington territory (*Brandegee & Tweedy*, August, 1883); Grave Creek pass, northern Montana (*H. B. Ayres*, September, 1883).

A low, much-branched, straggling, alpine tree, rarely exceeding 15 meters in height, with a trunk sometimes 1.50 meter in diameter; dry, rocky soil, generally upon northern exposures, and associated with *Pinus albicaulis* and *Tsuga Pattoniana* along the upper limits of tree-growth between 5,500 and 7,000 feet elevation (*Brandegee*).

The wood not collected.

NOTE.—A well-marked species, distinguished from *L. occidentalis* by its alpine habit, the larger green or purple deciduous cones with oiliated scales, and by the dense tomentum covering the young shoots and leaf buds.

## P A L M A C E Æ.

404.—*Sabal Palmetto*, Loddiges;

Römer & Schultes, Syst. vii, 1487.—Croom in Am. Jour. Sci. 1 ser. xxvi, 315.—Martius, Hist. Palm. iii, 247.—Kunth, Enum. iii, 247.—Spach, Hist. Veg. xii, 107.—Chapman, Fl. S. States, 438.—Curtis in Rep. Geological Surv. N. Carolina, 1860, iii, 64.—Wood, Cl. Book, 666; Bot. & Fl. 317.—Vasey, Cat. Forest Trees, 38.

*Corypha Palmetto*, Walter, Fl. Caroliniana, 119.

*Chamærops Palmetto*, Michaux, Fl. Bor.-Am. i, 206.—Michaux f. Hist. Arb.-Am. ii, 186, t. 10; N. American Sylva, 3 ed. iii, 5, t. 101.—Aiton, Hort. Kew. 2 ed. v, 490.—Nuttall, Genera, i, 231.—Elliott, Sk. i, 431.—Sprengel, Syst. ii, 137.—Eaton, Manual, 6 ed. 89.—Eaton & Wright, Bot. 191.—Darby, Bot. S. States, 546.—Cooper in Smithsonian Rep. 258.—Porcher, Resources, S. Forests, 526.

## CABBAGE TREE. CABBAGE PALMETTO.

Smith island, off the mouth of Cape Fear river, North Carolina, south along the coast to Key Largo, Florida, and along the Gulf coast to the Apalachicola river.

A tree 7 to 12 meters in height, with a trunk 0.60 to 0.90 meter in diameter; sandy maritime shores; very common and reaching its greatest development upon the west coast of the Florida peninsula south of Cedar Keys.

Wood light, soft; fibro-vascular bundles hard, difficult to work, dark colored; color, light brown; specific gravity, 0.4404; ash, 7.66; impervious to the attacks of the teredo, and very durable under water; largely used for piles, wharves, etc.

405.—*Washingtonia filifera*, Wendland,

Bot. Zeit. xxxvii, 68.—Watson, Bot. California, ii, 211, 485.

*Brahea dulcis*,? Cooper in Smithsonian Rep. 1860, 442 [not Martius].

*Pritchardia filamentosa*, Wendland in Bot. Zeit. xxxiv, 807.—Vasey, Cat. Forest Trees, 38.—Fenzi in Bull. Soc. Tosc. Ort. i, 116 & f.—Palmer in Am. Nat. xii, 598.

*Brahea filamentosa*, Hort.—Williams in London Gard. Chronicle, 1876, 80.

## FAN-LEAF PALM.

San Bernardino county, California, from the eastern base of the San Bernardino mountains to the valley of the Colorado river.

A tree 12 to 18 meters in height, with a trunk 0.60 to 1.05 meter in diameter, forming groves of 250 to 500 plants in the depressions of the desert, in moist alkaline soil, or solitary and scattered near the heads of small ravines formed by water-courses; often stunted and greatly injured by fire.

Wood light, soft; fibro-vascular bundles hard, difficult to cut, dark colored, conspicuous; specific gravity 0.5173; ash, 1.89.

406.—*Thrinax parviflora*, Swartz,

Prodr. 57; Fl. Ind. Occ. i, 614.—Aiton, Hort. Kew. iii, 614; 2 ed. ii, 307.—Willdenow, Spec. ii, 202.—Persoon, Syn. i, 383.—Poiret in Lamareck, Dict. vii, 633.—Titford, Hort. Bot. Am. 112.—Sprengel, Syst. ii, 20.—Römer & Schultes, Syst. vii, 1300.—Martius, Hist. Palm. iii, 255, t. 103.—Kunth, Enum. iii, 253.—Dietrich, Syn. ii, 1091.—Walpers, Ann. v, 818.—Grisebach, Fl. British West Indies, 515.—Vasey, Cat. Forest Trees, 38.—Chapman in Coulter's Bot. Gazette, iii, 12; Fl. S. States, Suppl. 651.

*T. Garberi*, Chapman in Coulter's Bot. Gazette, iii, 12; Fl. S. States, Suppl. 651.

## SILK-TOP PALMETTO.

Semi-tropical Florida, southern keys from Bahia Honda to Long's Key; in the West Indies.

A small tree, 9 meters in height with a trunk rarely exceeding 0.10 meter in diameter, or in pine-barren soil often low and stemless (*T. Garberi*).

Wood light, soft; fibro-vascular bundles small, hard, not conspicuous; color, light brown; specific gravity, 0.5991; ash, 3.99; the trunk used in making sponge and turtle-crawls.

407.—*Thrinax argentea*, Loddiges;

Desfontaines, Cat. 3 ed. 31.—Roemer & Schultes, Syst. vii, 1300.—Martius, Hist. Palm. iii, 256, t. 103, f. 3, t. 163.—Kunth, Enum. iii, 253.—Dietrich, Syn. ii, 1091.—Walpers, Ann. v, 818.—Grisebach, Fl. British West Indies, 515.—Chapman, Fl. S. States, Suppl. 651.

*Palma argentea*, Jacquin, Fragm. 38, No. 125, t. 43, f. 1.—Märter in Bom. Physik. Arbeiten. ii, 76.

## SILVER-TOP PALMETTO. BRICKLEY THATCH. BRITTLE THATCH.

Semi-tropical Florida, on a nameless key 10 miles west of Key West, Elliott's Key, Key Largo, Piney Key, Boca Chica Key, Key West, Gordon Key, and on the small keys south and west of Bahia Honda Key (*Ourtiss*); in the West Indies.

A small tree, 7 to 9 meters in height, with a trunk 0.15 to 0.20 meter in diameter.

Wood light, soft; fibro-vascular bundles small, very numerous; interior of the trunk spongy, much lighter than the exterior; specific gravity, 0.7172; ash, 3.01; used for piles, the foliage in the manufacture of ropes, for thatch, etc.

408.—*Oreodoxa regia*, HBK.

Nov. Genera & Spec. i, 305.—Martius, Hist. Palm. iii, 168, t. 156, f. 3-5.—Richard, Fl. Cuba, 348.—Kunth, Enum. iii, 182.—Spach, Hist. Veg. xii, 68.—Ill. Hort. ii, 28 & t.—Walpers, Ann. v, 807.—Grisebach, Fl. British West Indies, 327.—London Gard. Chronicle, 1875, 302, f. 66.—Chapman, Fl. S. States, Suppl. 651.

*Enocarpus regia*, Sprengel, Syst. ii, 140.

*O. oleracea*, ? Cooper in Smithsonian Rep. 1860, 440.

## ROYAL PALM.

Semi-tropical Florida, "Little and Big Palm hummocks," 15 and 25 miles east of cape Romano (*Ourtiss*), near the mouth of Little river, and on Elliott's Key; in the West Indies.

A tree 18 to 30 meters in height, with a trunk 0.60 meter in diameter; rich hummocks, often forming extensive groves; in Florida rare and local.

Wood heavy, hard; fibro-vascular bundles large, very dark, conspicuous; interior of the trunk spongy, much lighter than the exterior; color, brown; specific gravity, exterior of the trunk, 0.7982, interior, 0.2128; ash, 2.54.

## LILIA C E Æ.

409.—*Yucca canaliculata*, Hooker,

Bot. Mag. t. 5201.—Baker in London Gard. Chronicle, 1870, 1217.—Engelmann in Trans. St. Louis Acad. iii, 43.

*Y. Treculiana*, Carrière in Rev. Hort. vii, 280.—Baker in London Gard. Chronicle, 1870, 828.—Engelmann in Trans. St. Louis Acad. iii, 41.—Vasey, Cat. Forest Trees, 38.—London Garden, xii, 328, t. 94.

## SPANISH BAYONET.

Southern Texas, Matagorda bay, and from the Brazos and Guadalupe rivers south into Mexico.

A small tree, 5 to 8 meters in height, with a trunk 0.30 to 0.75 meter in diameter; dry, gravelly, arid soil.

Wood, like that of the whole genus, showing distinct marks of concentric arrangement, fibrous, spongy, heavy, difficult to cut and work; color, light brown; specific gravity, 0.6677; ash, 6.27.

The bitter, sweetish fruit cooked and eaten by the Mexicans; the root stock, as in the whole genus, saponaceous and largely used by the Mexicans as a substitute for soap.

410.—*Yucca brevifolia*, Engelmann,

King's Rep. v, 496; Trans. St. Louis Acad. iii, 47.—Parry in Am. Nat. ix, 141, 351.—Vasey, Cat. Forest Trees, 38.—Watson, Bot. California, ii, 164.

*Y. Draconis*, ? var. *arborescens*, Torrey in Pacific R. R. Rep. iv, 147.

## THE JOSHUA. JOSHUA TREE.

Southwestern Utah, northwestern Arizona to southern Nevada, and the valley of the Mohave river, California. A tree 6 to 12 meters in height, with a trunk 0.60 to 0.90 meter in diameter; dry, gravelly soil, forming upon the Mohave desert at 2,500 feet elevation an open, straggling forest.

Wood light, soft, spongy, difficult to work; color, very light brown or nearly white; specific gravity, 0.3737; ash, 4.00; occasionally manufactured into paper-pulp.

411.—*Yucca elata*, Engelmann,

Coulter's Bot. Gazette, vii, 17.

*Y. angustifolia*, var. *radiosa*, Engelmann in King's Rep. v, 496.

*Y. angustifolia*, var. *elata*, Engelmann in Trans. St. Louis Acad. iii, 50; Wheeler's Rep. vi, 270.

## SPANISH BAYONET.

Western Texas to southern Arizona and Utah; southward into Mexico.

A small tree, 3 to 5 meters in height, with a trunk 0.20 to 0.25 meter in diameter; dry, gravelly *mesas*. Wood light, soft, spongy; color, light brown or yellow; specific gravity, 0.4470; ash, 9.28.

412.—*Yucca baccata*, Torrey,

Bot. Mex. Boundary Survey, 221; Ives' Rep. 29.—Cooper in Smithsonian Rep. 1858, 266.—Baker in London Gard. Chronicle, 1870, 923.—André in Ill. Hort. 3 ser. xx, 23, t. 115.—Gray, Hall's Pl. Texas, 23.—Engelmann in Trans. St. Louis Acad. iii, 44; King's Rep. v, 496; Wheeler's Rep. vi, 270.—Loew in Wheeler's Rep. iii, 609.—Rothrock in Wheeler's Rep. vi, 52.—Watson, Bot. California, ii, 164.

*Y. filamentosa*, ? Wood in Proc. Philadelphia Acad. 1868, 167 [not Torrey].

## SPANISH BAYONET. MEXICAN BANANA.

Western Texas, south of latitude 32° N., west through New Mexico to southern Colorado and San Diego county, California; southward into northern Mexico.

A tree 7 to 12 meters in height, with a trunk 0.60 meter in diameter, or often much smaller, and toward the northern limits of its range stemless; forming upon the plains of Presidio county, Texas, extensive open forests (*Havard*).

Wood light, soft, spongy, difficult to work; color, light brown; specific gravity, 0.4470; ash, 9.28.

The large juicy fruit edible and an important article of food to Mexicans and Indians; a strong coarse fiber, prepared by macerating the leaves in water, is manufactured into rope by the Mexicans.

# INDEX TO CATALOGUE.

[NOTE.—In this index the names of families are indicated by "SMALL CAPS", of species by "Roman" type, and of synonyms by "Italics".]

## A.

	Page.		Page.
<i>Abies alba</i> ( <i>Picea alba</i> ) .....	204	<i>Abies Marylandica</i> .....	203
<i>Abies alba?</i> ( <i>Picea Engelmanni</i> ) .....	205	<i>Abies Menziesii</i> ( <i>Picea pungens</i> ) .....	205
<i>Abies alba</i> ( <i>Picea nigra</i> ) .....	203	<i>Abies Menziesii</i> ( <i>Picea Sitchensis</i> ) .....	205
<i>Abies alba</i> , var. <i>arctica</i> .....	204	<i>Abies Menziesii Parryana</i> .....	205
<i>Abies alba</i> , var. <i>cerulea</i> .....	204	<i>Abies Mertensiana</i> .....	207
<i>Abies Albertiana</i> .....	208	<i>Abies microcarpa</i> .....	215
<i>Abies amabilis</i> .....	213	<i>Abies mucronata</i> .....	200
<i>Abies amabilis</i> ( <i>Abies concolor</i> ) .....	212	? <i>Abies mucronata palustris</i> .....	200
<i>Abies amabilis</i> ( <i>Abies grandis</i> ) .....	212	<i>Abies nigra</i> ( <i>Picea Engelmanni</i> ) .....	205
<i>Abies amabilis</i> ( <i>Abies magnifica</i> ) .....	214	<i>Abies nigra</i> ( <i>Picea nigra</i> ) .....	203
<i>Abies Americana</i> .....	203	<i>Abies nigra</i> , var. <i>rubra</i> .....	208
<i>Abies arctica</i> ( <i>Picea alba</i> ) .....	204	<i>Abies nobilis</i> .....	214
<i>Abies arctica</i> ( <i>Picea nigra</i> ) .....	203	<i>Abies nobilis</i> ( <i>Abies magnifica</i> ) .....	214
? <i>Abies aromatica</i> .....	212	<i>Abies nobilis robusta</i> .....	214
<i>Abies balsamea</i> .....	210	<i>Abies Parsonsi</i> .....	212
? <i>Abies balsamea</i> ( <i>Abies concolor</i> ) .....	212	<i>Abies Pattoni</i> .....	208
<i>Abies balsamea</i> , var. <i>Fraseri</i> .....	210	<i>Abies Pattoniana</i> .....	208
<i>Abies balsamifera</i> .....	211	<i>Abies Pattonii</i> ( <i>Tsuga Mertensiana</i> ) .....	208
<i>Abies bifolia</i> .....	211	<i>Abies Pattonii</i> ( <i>Tsuga Pattoniana</i> ) .....	208
<i>Abies bracteata</i> .....	213	<i>Abies pendula</i> .....	215
<i>Abies Bridgesii</i> .....	207	<i>Abies religiosa</i> .....	185
<i>Abies campylocarpa</i> .....	214	<i>Abies rubra</i> .....	203
<i>Abies Canadensis</i> ( <i>Picea alba</i> ) .....	204	? <i>Abies rubra</i> , var. <i>arctica</i> .....	203
<i>Abies Canadensis</i> ( <i>Tsuga Canadensis</i> ) .....	206	<i>Abies rubra</i> , var. <i>cerulea</i> .....	204
<i>Abies Canadensis?</i> ( <i>Tsuga Mertensiana</i> ) .....	207	<i>Abies Sitchensis</i> .....	206
<i>Abies Caroliniana</i> .....	207	<i>Abies speciosa</i> ( <i>Tsuga Caroliniana</i> ) .....	207
<i>Abies cerulea</i> .....	204	<i>Abies subalpina</i> .....	211
<i>Abies concolor</i> .....	212	<i>Abies subalpina</i> , var. <i>fallax</i> .....	211
<i>Abies denticulata</i> .....	203	<i>Abies taxifolia</i> ( <i>Pseudotsuga Douglasii</i> ) .....	200
<i>Abies Douglasii</i> .....	200	<i>Abies taxifolia</i> ( <i>Tsuga Mertensiana</i> ) .....	208
<i>Abies Douglasii</i> , var. <i>macrocarpa</i> .....	210	? <i>Abies trigona</i> .....	206
<i>Abies Douglasii</i> , var. <i>taxifolia</i> .....	209	<i>Abies venusta</i> .....	213
<i>Abies Engelmanni</i> .....	205	<i>Abies Williamsontii</i> .....	208
<i>Abies Engelmanni glauca</i> .....	205	<i>Acacia Bahamensis</i> .....	64
? <i>Abies falcata</i> .....	206	<i>Acacia Berlandieri</i> .....	63
<i>Abies Fraseri</i> .....	210	<i>Acacia biceps</i> .....	62
<i>Abies Gordontana</i> .....	212	<i>Acacia esculenta</i> .....	63
<i>Abies grandis</i> .....	212	<i>Acacia frondosa</i> .....	62
<i>Abies grandis</i> ( <i>Abies amabilis</i> ) .....	213	<i>Acacia glauca</i> .....	62
<i>Abies grandis</i> ( <i>Abies concolor</i> ) .....	212	<i>Acacia, Green-bark</i> .....	60
<i>Abies grandis</i> ( <i>Abies subalpina</i> ) .....	211	<i>Acacia Greggii</i> .....	63
<i>Abies grandis</i> , var. <i>densiflora</i> .....	213	<i>Acacia latisiliqua</i> .....	64
<i>Abies grandis</i> , var. <i>Lowiana</i> .....	212	<i>Acacia leucocephala</i> .....	62
<i>Abies heterophylla</i> .....	207	<i>Acacia pulverulenta</i> .....	63
<i>Abies Hookeriana</i> .....	208	<i>Acacia tephroloba</i> .....	63
<i>Abies Hudsonica</i> .....	211	<i>Acacia, Three-thorned</i> .....	50
<i>Abies lasiocarpa</i> ( <i>Abies concolor</i> ) .....	212	<i>Acacia Wrightii</i> .....	63
<i>Abies? lasiocarpa</i> ( <i>Abies subalpina</i> ) .....	211	<i>Acer barbatum</i> ( <i>Acer glabrum</i> ) .....	48
<i>Abies laxa</i> .....	204	<i>Acer barbatum</i> ( <i>Acer saccharinum</i> ) .....	48
<i>Abies Lowiana</i> .....	212	<i>Acer Californicum</i> .....	51
<i>Abies macrocarpa</i> .....	210	<i>Acer Canadense</i> .....	46
<i>Abies magnifica</i> .....	214	? <i>Acer Caroliniana</i> .....	50
<i>Abies magnifica</i> ( <i>Abies nobilis</i> ) .....	214	<i>Acer circinatum</i> .....	47
<i>Abies Mariana</i> .....	202	<i>Acer coccineum</i> .....	50
		<i>Acer dasycarpum</i> .....	49

	Page.		Page.
<i>Acer Douglasii</i> .....	48	<i>Alnus glauca</i> .....	164
<i>Acer Drummondii</i> .....	50	? <i>Alnus glutinosa</i> ( <i>Alnus rubra</i> ).....	168
<i>Acer eriocarpum</i> .....	49	<i>Alnus glutinosa</i> , var. <i>rugosa</i> .....	164
<i>Acer glabrum</i> .....	47	<i>Alnus glutinosa</i> , var. <i>serrulata</i> ( <i>Alnus rhombifolia</i> ).....	168
? <i>Acer glaucum</i> .....	50	<i>Alnus glutinosa</i> , var. <i>serrulata</i> ( <i>Alnus serrulata</i> ).....	164
<i>Acer grandidentatum</i> .....	48	<i>Alnus hybrida</i> .....	164
<i>Acer macrophyllum</i> .....	47	<i>Alnus incana</i> .....	164
<i>Acer montanum</i> .....	46	<i>Alnus incana</i> (Regel).....	164
<i>Acer Negundo</i> .....	51	<i>Alnus incana</i> , var. <i>glauca</i> ( <i>Alnus incana</i> ).....	164
<i>Acer nigrum</i> .....	49	<i>Alnus incana</i> , var. <i>glauca</i> ( <i>Alnus incana</i> , var. <i>virescens</i> ).....	165
<i>Acer palmatum</i> .....	47	<i>Alnus incana</i> , var. <i>rubra</i> .....	163
<i>Acer parviflorum</i> .....	46	<i>Alnus incana</i> , var. <i>virescens</i> .....	165
<i>Acer Pennsylvanicum</i> .....	46	<i>Alnus Japonica</i> .....	162
<i>Acer Pennsylvanicum</i> ( <i>Acer spicatum</i> ).....	46	<i>Alnus maritima</i> .....	162
<i>Acer rubrum</i> .....	50	<i>Alnus maritima typica</i> .....	162
<i>Acer rubrum</i> , var. <i>Drummondii</i> .....	49	<i>Alnus oblongata</i> ( <i>Alnus maritima</i> ).....	162
<i>Acer rubrum</i> , var. <i>pallidum</i> .....	48	<i>Alnus oblongata</i> ( <i>Alnus serrulata</i> ).....	164
<i>Acer saccharinum</i> .....	49	<i>Alnus oblongifolia</i> .....	163
<i>Acer saccharinum</i> ( <i>Acer dasycarpum</i> ).....	49	<i>Alnus obtusifolia</i> .....	164
<i>Acer saccharinum</i> ( <i>Acer saccharinum</i> , var. <i>nigrum</i> ).....	49	<i>Alnus Oregona</i> .....	163
<i>Acer saccharinum</i> , var. <i>nigrum</i> .....	49	<i>Alnus rhombifolia</i> .....	168
<i>Acer saccharum</i> .....	48	<i>Alnus rubra</i> .....	163
<i>Acer sanguineum</i> .....	50	<i>Alnus rubra</i> ( <i>Alnus serrulata</i> ).....	164
<i>Acer spicatum</i> .....	46	<i>Alnus rugosa</i> .....	164
<i>Acer striatum</i> .....	46	<i>Alnus serrulata</i> .....	164
<i>Acer tripartitum</i> .....	48	? <i>Alnus serrulata</i> (Regel).....	164
<i>Acer virgatum</i> .....	47	<i>Alnus serrulata genuina</i> .....	164
<i>Achras cuneifolia</i> .....	103	<i>Alnus serrulata</i> , var. <i>latifolia</i> .....	164
<i>Achras mammosa</i> .....	103	<i>Alnus serrulata</i> , var. <i>macrophylla</i> .....	164
<i>Achras pallida</i> .....	101	<i>Alnus serrulata</i> , var. <i>oblongata</i> .....	164
<i>Achras salicifolia</i> .....	101	<i>Alnus serrulata</i> , var. <i>oblongifolia</i> .....	163
? <i>Achras serrata</i> .....	69	<i>Alnus serrulata</i> , var. <i>rugosa</i> ( <i>Alnus incana</i> , var. <i>virescens</i> ).....	165
<i>Achras Zapotilla</i> , var. <i>parviflora</i> .....	103	<i>Alnus serrulata</i> , var. <i>rugosa</i> ( <i>Alnus rhombifolia</i> ).....	163
<i>Adelia acuminata</i> .....	112	<i>Alnus serrulata</i> , var. <i>rugosa</i> ( <i>Alnus serrulata</i> ).....	164
<i>Aesculus Californica</i> .....	43	<i>Alnus serrulata</i> , var. <i>vulgaris</i> .....	164
? <i>Aesculus carnea</i> .....	42	<i>Alnus undulata</i> .....	164
<i>Aesculus discolor</i> .....	43	<i>Amelanchier alnifolia</i> .....	85
<i>Aesculus echinata</i> .....	42	<i>Amelanchier Bartramiana</i> .....	84
<i>Aesculus flava</i> .....	43	<i>Amelanchier Botryapium</i> .....	84
<i>Aesculus flava</i> , var. <i>purpurascens</i> .....	43	<i>Amelanchier Canadensis</i> .....	84
<i>Aesculus glabra</i> .....	42	<i>Amelanchier Canadensis</i> , var. <i>oblongifolia</i> .....	84
<i>Aesculus Hippocastanum</i> , var. <i>glabra</i> .....	42	<i>Amelanchier Canadensis</i> , var. <i>oligocarpa</i> .....	84
<i>Aesculus Hippocastanum</i> , var. <i>Ohioensis</i> .....	42	<i>Amelanchier Canadensis</i> , var. <i>rotundifolia</i> .....	84
<i>Aesculus Hippocastanum</i> , var. <i>pallida</i> .....	42	<i>Amelanchier intermedia</i> .....	85
<i>Aesculus hybrida</i> .....	43	<i>Amelanchier oblongifolia</i> .....	85
<i>Aesculus lutea</i> .....	43	<i>Amelanchier ovalis</i> ( <i>Amelanchier Canadensis</i> ).....	84
<i>Aesculus neglecta</i> .....	43	<i>Amelanchier ovalis</i> ( <i>Amelanchier Canadensis</i> , var. <i>oblongifolia</i> ).....	85
<i>Aesculus octandra</i> .....	43	<i>Amelanchier spicata</i> .....	85
<i>Aesculus Ohioensis</i> .....	42	<i>Amelanchier Wangenheimiana</i> .....	84
<i>Aesculus pallida</i> .....	42	<i>American Crab</i> .....	72
<i>Aesculus Pavia</i> , var. <i>discolor</i> .....	43	<i>American Crab Apple</i> .....	73
? <i>Aesculus Watsoniana</i> .....	42	<i>American Elm</i> .....	123
<i>Agastianis secundiflora</i> .....	57	<i>American Holly</i> .....	35
<i>Ageria Cassena</i> .....	36	<i>American Linden</i> .....	27
<i>Ageria geminata</i> .....	36	<i>Amyris cymosa</i> .....	33
<i>Ageria heterophylla</i> .....	35	<i>Amyris dyatropa</i> .....	33
<i>Ageria obovata</i> .....	35	<i>Amyris elemifera</i> .....	31
<i>Ageria opaca</i> .....	35	<i>Amyris Floridana</i> .....	33
<i>Ageria palustris</i> .....	35	<i>Amyris maritima</i> .....	33
<i>Alder</i> ( <i>Alnus oblongifolia</i> ).....	163	<i>Amyris Plumieri</i> .....	33
<i>Alder</i> ( <i>Alnus rhombifolia</i> ).....	163	<i>Amyris sylvatica</i> .....	33
<i>Alder</i> ( <i>Alnus rubra</i> ).....	163	ANACARDIACEÆ.....	52-54
<i>Alder</i> , Black ( <i>Alnus incana</i> ).....	165	<i>Ananomis punctata</i> .....	38
<i>Alder</i> , Black ( <i>Alnus serrulata</i> ).....	164	<i>Anaqua</i> .....	114
<i>Alder</i> , Hoary.....	165	<i>Andromeda arborea</i> .....	98
<i>Alder</i> , Seaside.....	102	<i>Andromeda arborescens</i> .....	98
<i>Alder</i> , Smooth.....	104	<i>Andromeda ferruginea</i> .....	96
<i>Alder</i> , Speckled.....	105	<i>Andromeda ferruginea</i> , var. <i>arborescens</i> .....	96
<i>Algaroba</i> .....	62	<i>Andromeda ferruginea</i> , var. <i>fruticosa</i> .....	96
<i>Algarobia glandulosa</i> .....	61	<i>Andromeda plumata</i> .....	37
<i>Alnus Americana</i> ( <i>Alnus incana</i> ).....	164	<i>Andromeda rhomboidalis</i> .....	96
<i>Alnus Americana</i> ( <i>Alnus serrulata</i> ).....	164	<i>Andromeda rigida</i> .....	96
<i>Alnus arguta</i> .....	162	<i>Anona glabra</i> .....	23
<i>Alnus Canadensis</i> .....	164	<i>Anona laurifolia</i> .....	23
<i>Alnus gonuina</i> .....	164	<i>Anona pendula</i> .....	23

	Page.		Page.
<i>Anona</i> species ( <i>Anona laurifolia</i> )	23	Bartram's Oak	158
<i>Anona triloba</i>	23	Basket Oak	141
ANONACEÆ		Basswood	27
<i>Anonymos aquaticus</i>	124	Basswood, White	28
<i>Anthomeles aestivalis</i>	82	Bastard Cedar	176
<i>Anthomeles Douglasi</i>	75	Bastard Pine	202
<i>Anthomeles flava</i>	82	<i>Batodendron arboreum</i>	98
<i>Anthomeles glandulosa</i>	82	Bayonet, Spanish ( <i>Yucca baccata</i> )	210
<i>Anthomeles rotundifolia</i>	77	Bayonet, Spanish ( <i>Yucca canaliculata</i> )	218
<i>Anthomeles turbinata</i>	82	Bayonet, Spanish ( <i>Yucca elata</i> )	210
Ants' Wood	103	Bay, Bull	10
Apple, American Crab	72	Bay, Loblooly	25
Apple, Custard	23	Bay, Red	118
Apple, Haw	82	Bay, Rose	99
Apple, Oregon Crab	73	Bay, Sweet	20
Apple, Pond	23	Bay, Tan	25
Apple, Seven-year	95	Bay, White	20
Apple, Southern Crab	72	Bayberry	136
Arbol de Hierro	56	Bay Tree, California	120
Arbor-vitæ	176	Bean Tree	115
<i>Arbutus laurifolia</i>	97	Bearberry	41
? <i>Arbutus macrophylla</i>	97	Bearwood	41
<i>Arbutus Menziesii</i>	97	Beaver Tree	20
<i>Arbutus Menziesii</i> ( <i>Arbutus Texana</i> )	97	Beech	158
<i>Arbutus Menziesii</i> ( <i>Arbutus Xalapensis</i> )	97	Beech, Blue	159
<i>Arbutus procera</i>	97	Beech, Water ( <i>Carpinus Caroliniana</i> )	159
<i>Arbutus Texana</i>	97	Beech, Water ( <i>Platanus occidentalis</i> )	129
? <i>Arbutus varians</i>	97	Beefwood	117
<i>Arbutus Xalapensis</i>	97	Bee Tree	27
? <i>Arbutus Xalapensis</i> ( <i>Arbutus Texana</i> )	97	<i>Benthamedia florida</i>	99
<i>Ardisia Pickeringia</i>	100	<i>Betula acuminata</i>	159
<i>Aronia arborea</i>	84	<i>Betula alba</i> , subspecies <i>commutata</i>	160
<i>Aronia arbutifolia</i>	83	<i>Betula alba</i> , subspecies <i>occidentalis typica</i>	160
<i>Aronia Botryapium</i>	84	<i>Betula alba</i> , subspecies <i>papyrifera</i>	160
<i>Aronia cordata</i>	84	<i>Betula alba</i> , subspecies <i>papyrifera</i> , var. <i>communis</i>	160
<i>Aronia ovalis</i>	85	<i>Betula alba</i> , subspecies <i>papyrifera</i> , var. <i>cordifolia</i>	160
Arrowwood	88	<i>Betula alba</i> , subspecies <i>populifolia</i>	159
<i>Asagraea spinosa</i>	55	<i>Betula alba</i> , var. <i>papyrifera</i>	160
Ash	107	<i>Betula alba</i> , var. <i>populifolia</i>	159
Ash, Black	111	<i>Betula alba</i> , var. <i>populifolia</i> ( <i>Betula papyrifera</i> )	160
Ash, Blue	111	<i>Betula angulata</i>	101
Ash, Green	109	<i>Betula Canadensis</i>	100
Ash, Ground	111	<i>Betula carpinifolia</i>	102
Ash, Hoop	111	<i>Betula cordifolia</i>	100
Ash, Mountain ( <i>Pyrus Americana</i> )	73	<i>Betula excelsa</i> ( <i>Betula lenta</i> )	102
Ash, Mountain ( <i>Pyrus sambucifolia</i> )	74	<i>Betula excelsa</i> ( <i>Betula lutea</i> )	101
Ash, Oregon	111	<i>Betula grandis</i>	100
Ash, Prickly ( <i>Xanthoxylum Americanum</i> )	29	<i>Betula incana</i>	104
Ash, Prickly ( <i>Xanthoxylum Clava-Herculis</i> )	30	<i>Betula lanulosa</i>	101
Ash, Red	100	<i>Betula lenta</i>	102
Ash, Sea	80	<i>Betula lenta</i> ( <i>Betula alba</i> , var. <i>populifolia</i> )	159
Ash, Wafer	81	<i>Betula lenta</i> ( <i>Betula lutea</i> )	101
Ash, Water	110	<i>Betula lutea</i>	101
Ash, White	107	<i>Betula nigra</i>	101
Ash, Yellow	57	<i>Betula nigra</i> ( <i>Betula lenta</i> )	102
Ash-leaved Maple	51	<i>Betula nigra</i> ( <i>Betula papyrifera</i> )	100
<i>Asimina campaniflora</i>	23	<i>Betula occidentalis</i>	100
<i>Asimina triloba</i>	23	<i>Betula occidentalis</i> ( <i>Betula papyrifera</i> )	100
Aspen	171	<i>Betula papyracea</i>	159
Asp, Quaking	171	<i>Betula papyrifera</i>	159
<i>Avicennia nitida</i>	117	<i>Betula populifolia</i>	159
<i>Avicennia oblongifolia</i>	117	<i>Betula rubra</i> ( <i>Betula nigra</i> )	101
<i>Avicennia tomentosa</i>	117	<i>Betula rubra</i> ( <i>Betula papyrifera</i> )	100
		<i>Betula rugosa</i>	104
		<i>Betula serrulata</i>	104
Bald Cypress	184	? <i>Betula-Alnus glauca</i>	104
Balm of Gilead	173	<i>Betula-Alnus maritima</i>	102
Balm of Gilead Fir	211	? <i>Betula-Alnus rubra</i>	104
Balsam ( <i>Abies Fraseri</i> )	210	<i>Betula-Alnus</i> , var. $\beta$ <i>incana</i>	104
Balsam ( <i>Abies subalpina</i> )	211	BETULACEÆ	159-165
Balsam ( <i>Populus balsamifera</i> )	173	Big-bud Hickory	104
Balsam Cottonwood	174	Big Cottonwood	175
Balsam Fir ( <i>Abies balsamea</i> )	211	Big Laurel	19
Balsam Fir ( <i>Abies concolor</i> )	213	Big Shell-bark	133
Balsam, She	210	Big Tree	184
Banana, Mexican	219		

INDEX TO CATALOGUE OF FOREST TREES.

223

	Page.		Page.
<i>Bigelovia acuminata</i> .....	112	<i>Bourreria Havanensis</i> .....	114
<i>Bignonia Catalpa</i> .....	115	<i>Bourreria Havanensis, var. radula</i> .....	114
<i>Bignonia linearis</i> .....	116	<i>Bourreria ovata</i> .....	114
<b>BIGNONIACEÆ</b> .....	115, 116	<i>Bourreria radula</i> .....	114
Bilsted .....	86	<i>Bourreria recurva</i> .....	114
Birch, Black ( <i>Betula lenta</i> ) .....	162	<i>Bourreria tomentosa</i> .....	114
Birch, Black ( <i>Betula occidentalis</i> ) .....	160	<i>Bourreria tomentosa, var. Havanensis</i> .....	114
Birch, Canoe .....	100	Box Elder ( <i>Negundo aceroides</i> ) .....	51
Birch, Cherry .....	162	Box Elder ( <i>Negundo Californicum</i> ) .....	51
Birch, Gray ( <i>Betula alba, var. populifolia</i> ) .....	150	Boxwood ( <i>Cornus florida</i> ) .....	91
Birch, Gray ( <i>Betula lutea</i> ) .....	161	Boxwood ( <i>Schafferia frutescens</i> ) .....	39
Birch, Mahogany .....	162	<i>Brahea dulcis?</i> .....	217
Birch, Old-field .....	150	<i>Brahea filamentosa</i> .....	217
Birch, Paper .....	160	Brickley Thatch .....	218
Birch, Red .....	161	Brittle Thatch .....	218
Birch, River .....	161	Broad-leaved Maple .....	47
Birch, Sweet .....	162	<i>Broussonetia secundiflora</i> .....	57
Birch, West Indian .....	33	<i>Broussonetia tinctoria</i> .....	128
Birch, White ( <i>Betula alba, var. populifolia</i> ) .....	150	Brown Hickory .....	184
Birch, White ( <i>Betula papyrifera</i> ) .....	160	<i>Bucida Buceras</i> .....	87
Birch, Yellow .....	161	Buckeye, California .....	44
Bishop's Pine .....	200	Buckeye, Fetid .....	42
Bitter Nut .....	135	Buckeye, Ohio .....	42
Bitter Pecan .....	136	Buckeye, Spanish .....	44
Black Alder ( <i>Alnus incana</i> ) .....	165	Buckeye, Sweet .....	43
Black Alder ( <i>Alnus serrulata</i> ) .....	164	Buckthorn, Southern .....	163
Black Ash .....	111	Buckwheat Tree .....	38
Black Birch ( <i>Betula lenta</i> ) .....	162	Bull Bay .....	19
Black Birch ( <i>Betula occidentalis</i> ) .....	160	Bull Nut .....	184
Black Calabash Tree .....	116	Bull Pine ( <i>Pinus jeffreyi</i> ) .....	163
Black Cherry, Wild .....	68	Bull Pine ( <i>Pinus mitis</i> ) .....	200
Black Cottonwood ( <i>Populus angustifolia</i> ) .....	174	Bull Pine ( <i>Pinus ponderosa</i> ) .....	193
Black Cottonwood ( <i>Populus trichocarpa</i> ) .....	174	Bull Pine ( <i>Pinus Sabiniana</i> ) .....	195
Black Cypress .....	184	<i>Bumelia angustifolia</i> .....	103
Black Gum .....	92	<i>Bumelia arborea</i> .....	102
Black Haw .....	94	<i>Bumelia chrysophyllodes</i> .....	101
Black Hickory ( <i>Carya porcina</i> ) .....	134	<i>Bumelia cuneata</i> .....	103
Black Hickory ( <i>Carya tomentosa</i> ) .....	134	<i>Bumelia ferruginea</i> .....	102
Black Ironwood .....	39	<i>Bumelia fastidissima</i> .....	101
Black Jack ( <i>Quercus Catesbaei</i> ) .....	151	<i>Bumelia lanuginosa</i> .....	102
Black Jack ( <i>Quercus nigra</i> ) .....	150	<i>Bumelia lanuginosa, var. macrocarpa</i> .....	102
Black Jack, Forked-leaf .....	151	<i>Bumelia lycioides</i> .....	102
Black Larch .....	215	<i>Bumelia lycioides, var. reclinata</i> .....	103
Black Locust ( <i>Gloditschia trinanthos</i> ) .....	50	<i>Bumelia macrocarpa</i> .....	102
Black Locust ( <i>Robinia Pseudacacia</i> ) .....	55	<i>Bumelia Mastichodendron</i> .....	101
Black Mangrove .....	117	<i>Bumelia myrsinifolia</i> .....	103
Black Oak ( <i>Quercus Emoryi</i> ) .....	146	? <i>Bumelia oblongifolia</i> .....	102
Black Oak ( <i>Quercus Kelloggii</i> ) .....	140	<i>Bumelia pallida</i> .....	101
Black Oak ( <i>Quercus rubra</i> ) .....	148	<i>Bumelia parvifolia</i> .....	103
Black Oak ( <i>Quercus tinctoria</i> ) .....	140	<i>Bumelia reclinata</i> ( <i>Bumelia cuneata</i> ) .....	103
Black Persimmon .....	105	<i>Bumelia reclinata</i> ( <i>Bumelia lycioides</i> ) .....	103
Black Pine ( <i>Pinus jeffreyi</i> ) .....	193	? <i>Bumelia reclinata</i> ( <i>Bumelia tenax</i> ) .....	101
Black Pine ( <i>Pinus Murrayana</i> ) .....	195	<i>Bumelia salicifolia</i> .....	101
Black Sloe .....	67	? <i>Bumelia serrata</i> .....	69
Black Spruce .....	203	<i>Bumelia spinosa</i> .....	102
Black Sugar Maple .....	49	<i>Bumelia tenax</i> .....	101
Black Thorn .....	79	<i>Bumelia tomentosa</i> .....	102
Black Tree .....	117	Bumwood .....	54
Black Walnut .....	131	Burning Bush .....	88
Black Willow ( <i>Salix flavescens, var. Scouleriana</i> ) .....	170	Burr Oak .....	140
Black Willow ( <i>Salix nigra</i> ) .....	166	<i>Bursera acuminata</i> .....	32
Blackwood .....	117	<i>Bursera gummifera</i> .....	32
Blue Ash .....	111	<b>BURSERACEÆ</b> .....	32, 33
Blue Beech .....	150	Bustie .....	101
Blue Jack .....	153	Butternut .....	130
Blue Myrtle .....	41	Button-ball Tree .....	129
Blue Oak .....	148	Buttonwood ( <i>Conocarpus erecta</i> ) .....	87
Blue Spruce .....	205	Buttonwood ( <i>Platanus occidentalis</i> ) .....	129
Bluewood .....	40	Buttonwood ( <i>Platanus racemosa</i> ) .....	129
Bois d'Arc .....	128	Buttonwood, White .....	87
<b>BORRAGINACEÆ</b> .....	118, 114	<i>Byrsonima lucida</i> .....	28
<i>Borya acuminata</i> .....	112		
<i>Borya ligustrina</i> .....	112		
<i>Borya nitida</i> .....	112		
Bottom Shell-bark .....	133		
		<b>C.</b>	
		<i>Caballeria coriacea</i> .....	90
		Cabbage Palmetto .....	217
		Cabbage Tree .....	217

<p><b>CACTACEÆ</b> ..... 89, 90</p> <p>Cactus, Giant ..... 90</p> <p>Cagiput ..... 120</p> <p>Calabash Tree, Black ..... 116</p> <p>Calico Bush ..... 98</p> <p>Calicowood ..... 106</p> <p>California Bay Tree ..... 120</p> <p>California Buckeye ..... 44</p> <p>California Holly ..... 84</p> <p>California Laurel ..... 120</p> <p>California Nutmeg ..... 186</p> <p>California Olive ..... 120</p> <p><i>Calothyrsus Californica</i> ..... 43</p> <p>Calyptranthes Chytraoulia ..... 88</p> <p>Canada Plum ..... 65</p> <p>Canella alba ..... 24</p> <p><i>Canella laurifolia</i> ..... 24</p> <p><i>Canella Winterana</i> ..... 24</p> <p><b>CANELLACEÆ</b> ..... 24</p> <p>Canoe Birch ..... 160</p> <p>Canoe Cedar ..... 177</p> <p><i>Canotia holocantha</i> ..... 32</p> <p><b>CAPPARIDACEÆ</b> ..... 24</p> <p><i>Capparis Breynia</i> ..... 24</p> <p><i>Capparis cynophyllophora</i> ..... 24</p> <p><i>Capparis emarginata</i> ..... 24</p> <p><i>Capparis Jamaicensis</i> ..... 24</p> <p><i>Capparis siliquosa</i> ..... 24</p> <p><i>Capparis torulosa</i> ..... 24</p> <p><i>Capparis uncinata</i> ..... 24</p> <p><b>CAPRIFOLIACEÆ</b> ..... 93, 94</p> <p><i>Cardiotelepis ob'usa</i> ..... 41</p> <p>Carolina Poplar ..... 175</p> <p><i>Carpinus Americana</i> ..... 158</p> <p><i>Carpinus Betulus Virginiana</i> ..... 158</p> <p><i>Carpinus Caroliniana</i> ..... 158</p> <p><i>Carpinus Ostrya</i> ..... 158</p> <p><i>Carpinus Ostrya, var. Americana</i> ..... 158</p> <p><i>Carpinus triflora</i> ..... 158</p> <p><i>Carpinus Virginiana</i> ..... 158</p> <p><i>Carya alba</i> ..... 132</p> <p><i>Carya alba (Carya tomentosa)</i> ..... 134</p> <p><i>Carya amara</i> ..... 135</p> <p><i>Carya amara, var. myristicaeformis</i> ..... 135</p> <p><i>Carya amara, var. porcina</i> ..... 134</p> <p><i>Carya angustifolia</i> ..... 132</p> <p><i>Carya aquatica</i> ..... 135</p> <p><i>Carya cathartica</i> ..... 130</p> <p><i>Carya cordiformis</i> ..... 133</p> <p><i>Carya glabra</i> ..... 134</p> <p><i>Carya Illinoisensis</i> ..... 132</p> <p><i>Carya integrifolia</i> ..... 135</p> <p><i>Carya microcarpa</i> ..... 133</p> <p><i>Carya myristicaeformis</i> ..... 135</p> <p><i>Carya oliviformis</i> ..... 132</p> <p><i>Carya perclina</i> ..... 134</p> <p><i>Carya sulcata</i> ..... 133</p> <p>? <i>Carya tetraptera</i> ..... 132</p> <p><i>Carya tomentosa</i> ..... 133</p> <p><i>Carya tomentosa, var. maxima</i> ..... 134</p> <p><i>Caryotaxus Myristica</i> ..... 186</p> <p><i>Caryotaxus taxifolia</i> ..... 186</p> <p>Cassida ..... 101</p> <p>Cassena ..... 36</p> <p><i>Cassine Caroliniana</i> ..... 36</p> <p><i>Cassine Peragua</i> ..... 36</p> <p><i>Cassine ramulosa</i> ..... 36</p> <p><i>Castanea alnifolia</i> ..... 156</p> <p><i>Castanea Americana</i> ..... 157</p> <p><i>Castanea chrysophylla</i> ..... 156</p> <p><i>Castanea chrysophylla, var. minor</i> ..... 156</p> <p><i>Castanea nana</i> ..... 156</p> <p><i>Castanea pumila</i> ..... 156</p> <p><i>Castanea sempervirens</i> ..... 156</p> <p><i>Castanea vesca (Castanea pumila)</i> ..... 156</p>	<p>Page.</p> <p>89, 90</p> <p>90</p> <p>120</p> <p>116</p> <p>98</p> <p>106</p> <p>120</p> <p>44</p> <p>84</p> <p>120</p> <p>186</p> <p>120</p> <p>43</p> <p>88</p> <p>65</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>24</p> <p>93, 94</p> <p>41</p> <p>175</p> <p>158</p> <p>158</p> <p>158</p> <p>158</p> <p>158</p> <p>158</p> <p>158</p> <p>132</p> <p>134</p> <p>135</p> <p>135</p> <p>134</p> <p>132</p> <p>135</p> <p>130</p> <p>133</p> <p>134</p> <p>132</p> <p>135</p> <p>133</p> <p>135</p> <p>132</p> <p>134</p> <p>133</p> <p>132</p> <p>134</p> <p>186</p> <p>186</p> <p>101</p> <p>36</p> <p>36</p> <p>36</p> <p>36</p> <p>36</p> <p>156</p> <p>157</p> <p>156</p> <p>156</p> <p>156</p> <p>156</p> <p>156</p> <p>156</p> <p>156</p>	<p><i>Castanea vesca (Castanea vulgaris, var. Americana)</i> ..... 157</p> <p><i>Castanea vesca, var. Americana</i> ..... 157</p> <p><i>Castanea vulgaris, var. Americana</i> ..... 157</p> <p><i>Castanopsis chrysophylla</i> ..... 156</p> <p><i>Castanopsis chrysophylla, var. minor</i> ..... 156</p> <p><i>Castanopsis chrysophylla, var. pumila</i> ..... 156</p> <p>Catalpa ..... 115</p> <p><i>Catalpa bignonoides</i> ..... 115</p> <p><i>Catalpa bignonoides (Catalpa speciosa)</i> ..... 115</p> <p><i>Catalpa communis</i> ..... 115</p> <p><i>Catalpa cordifolia (Catalpa bignonoides)</i> ..... 115</p> <p><i>Catalpa cordifolia (Catalpa speciosa)</i> ..... 115</p> <p><i>Catalpa speciosa</i> ..... 115</p> <p><i>Catalpa syringaeifolia</i> ..... 115</p> <p>Catalpa, Western ..... 115</p> <p>Catawba ..... 115</p> <p>Cat's Claw (<i>Acacia Groggii</i>) ..... 63</p> <p>Cat's Claw (<i>Acacia Wrightii</i>) ..... 63</p> <p><i>Cat's Claw (Pithecolobium Unguis-cati)</i> ..... 64</p> <p><i>Ceanothus ferreus</i> ..... 39</p> <p><i>Ceanothus laevigatus</i> ..... 39</p> <p><i>Ceanothus reclinatus</i> ..... 41</p> <p><i>Ceanothus thyrsiflorus</i> ..... 41</p> <p>Cedar, Bastard ..... 176</p> <p>Cedar, Canoe ..... 177</p> <p>Cedar Elm ..... 122</p> <p>Cedar, Incense ..... 176</p> <p>Cedar, Oregon ..... 179</p> <p>Cedar Pine ..... 201</p> <p>Cedar, Port Orford ..... 179</p> <p>Cedar, Post ..... 176</p> <p>Cedar, Red (<i>Juniperus Virginiana</i>) ..... 182</p> <p>Cedar, Red (<i>Thuja gigantea</i>) ..... 177</p> <p><i>Cedar, Stinking (Torreya Californica)</i> ..... 180</p> <p><i>Cedar, Stinking (Torreya taxifolia)</i> ..... 186</p> <p>Cedar, White (<i>Chamaecyparis Lawsoniana</i>) ..... 179</p> <p>Cedar, White (<i>Chamaecyparis spherioidea</i>) ..... 178</p> <p>Cedar, White (<i>Libocedrus decurrens</i>) ..... 176</p> <p>Cedar, White (<i>Thuja occidentalis</i>) ..... 176</p> <p><i>Cedrus Mahogoni</i> ..... 33</p> <p><b>CELASTRACEÆ</b> ..... 98, 99</p> <p><i>Celtis alba</i> ..... 125</p> <p><i>Celtis Audubertiana</i> ..... 120</p> <p><i>Celtis Audubertiana, var. oblongata</i> ..... 120</p> <p><i>Celtis Audubertiana, var. ovata</i> ..... 120</p> <p><i>Celtis Berlandieri</i> ..... 120</p> <p><i>Celtis brevipes</i> ..... 120</p> <p><i>Celtis cantina</i> ..... 125</p> <p><i>Celtis cordata</i> ..... 125</p> <p><i>Celtis crassifolia</i> ..... 125</p> <p><i>Celtis crassifolia, var. eucalyptifolia</i> ..... 125</p> <p><i>Celtis crassifolia, var. mortifolia</i> ..... 125</p> <p><i>Celtis crassifolia, var. tiltæfolia</i> ..... 125</p> <p><i>Celtis Douglasii</i> ..... 126</p> <p><i>Celtis Floridiana</i> ..... 125</p> <p><i>Celtis fuscata</i> ..... 125</p> <p><i>Celtis heterophylla</i> ..... 125</p> <p><i>Celtis integrifolia</i> ..... 125</p> <p><i>Celtis laevigata</i> ..... 125</p> <p><i>Celtis Lindheimeri</i> ..... 126</p> <p><i>Celtis tongifolia</i> ..... 125</p> <p><i>Celtis maritima (in Am. Monthly Mag. and Crit. Rev.)</i> ..... 126</p> <p><i>Celtis maritima (in New Fl. and Bot.)</i> ..... 125</p> <p><i>Celtis Mississippiensis</i> ..... 125</p> <p><i>Celtis mortifolia</i> ..... 125</p> <p><i>Celtis obliqua</i> ..... 125</p> <p><i>Celtis occidentalis</i> ..... 125</p> <p><i>Celtis occidentalis, var. cordata</i> ..... 125</p> <p><i>Celtis occidentalis, var. crassifolia</i> ..... 126</p> <p><i>Celtis occidentalis, var. grandidentata</i> ..... 125</p> <p><i>Celtis occidentalis, var. integrifolia</i> ..... 125</p> <p><i>Celtis occidentalis, var. pumila (Celtis occidentalis)</i> ..... 126</p> <p>? <i>Celtis occidentalis, var. pumila (Celtis occidentalis var. reticulata)</i> ..... 126</p> <p><i>Celtis occidentalis, var. reticulata</i> ..... 126</p> <p><i>Celtis occidentalis, var. scabriuscula</i> ..... 125</p>
--	--	---

	Page.		Page.
<i>Celtis occidentalis</i> , var. <i>serrulata</i> .....	125	<i>Chilopsis linearis</i> .....	110
<i>Celtis occidentalis</i> , var. <i>tenusifolia</i> .....	125	<i>Chilopsis saligna</i> .....	110
<i>Celtis patula</i> .....	125	<i>Chionanthus amygdalinus</i> .....	69
<i>Celtis pumila</i> .....	125	China, Wild .....	44
<i>Celtis reticulata</i> .....	126	Chinquapin ( <i>Castanea pumila</i> ) .....	150
<i>Celtis rubicifolia</i> .....	125	Chinquapin ( <i>Castanopsis chrysophylla</i> ) .....	156
<i>Celtis tenuifolia</i> .....	125	Chinquapin Oak .....	143
<i>Celtis Texana</i> .....	126	<i>Chionanthus angustifolia</i> .....	112
<i>Cerasus Americana</i> .....	65	<i>Chionanthus heterophylla</i> .....	112
<i>Cerasus borealis</i> .....	68	<i>Chionanthus longifolia</i> .....	112
<i>Cerasus Capolin</i> .....	68	<i>Chionanthus maritima</i> .....	112
<i>Cerasus Capuli</i> .....	68	<i>Chionanthus montana</i> .....	112
<i>Cerasus Caroliniana</i> .....	69	<i>Chionanthus trifida</i> .....	112
<i>Cerasus Chicasa</i> .....	66	<i>Chionanthus Virginia</i> .....	112
<i>Cerasus demissa</i> .....	69	<i>Chionanthus Virginia</i> , var. <i>angustifolia</i> .....	112
<i>Cerasus emarginata</i> .....	67	<i>Chionanthus Virginia</i> , var. <i>latifolia</i> .....	112
<i>Cerasus erecta</i> .....	67	<i>Chionanthus Virginia</i> , var. <i>maritima</i> .....	112
<i>Cerasus glandulosa</i> .....	67	<i>Chionanthus Virginia</i> , var. <i>montana</i> .....	112
<i>Cerasus hiemalis</i> .....	65	Chittam wood .....	52
<i>Cerasus ilicifolia</i> .....	70	<i>Chloromeles sempervirens</i> .....	72
<i>Cerasus mollis</i> .....	67	<i>Chrysobalanus Icaco</i> .....	64
<i>Cerasus nigra</i> .....	65	<i>Chrysobalanus Icaco</i> , var. <i>pellecarpa</i> .....	65
<i>Cerasus Pennsylvanica</i> .....	66	<i>Chrysobalanus pellecarpa</i> .....	65
? <i>Cerasus persicifolia</i> .....	66	<i>Chrysophyllum Barbasco</i> .....	100
<i>Cerasus serotina</i> ( <i>Prunus domissa</i> ) .....	69	<i>Chrysophyllum Caneto</i> , β. .....	100
<i>Cerasus serotina</i> ( <i>Prunus serotina</i> ) .....	68	<i>Chrysophyllum ferrugineum</i> .....	100
<i>Cerasus sphaerocarpa</i> .....	70	<i>Chrysophyllum microphyllum</i> .....	100
<i>Cerasus umbellata</i> .....	67	<i>Chrysophyllum monopyrenum</i> .....	100
<i>Cerasus Virginiana</i> .....	68	<i>Chrysophyllum oliviforme</i> .....	100
<i>Cercidium floridum</i> .....	60	Cigar Tree .....	115
<i>Cercis Canadensis</i> .....	61	<i>Cinchona Caribaea</i> .....	95
<i>Cercis Canadensis</i> , var. <i>pubescens</i> .....	61	<i>Cinchona Caroliniana</i> .....	95
<i>Cercis occidentalis</i> .....	61	<i>Cinchona Jamaicensis</i> .....	95
<i>Cercis occidentalis</i> , var. .....	61	Cinnamon Bark .....	24
<i>Cercis occidentalis</i> , var. <i>Texasensis</i> .....	61	Cinnamon, Wild .....	24
<i>Cercis reniformis</i> .....	61	<i>Citharexylum villosum</i> .....	116
<i>Cercocarpus betulaceifolius</i> .....	71	<i>Cladrastis lutea</i> .....	57
<i>Cercocarpus betuloides</i> .....	71	<i>Cladrastis tinctoria</i> .....	57
<i>Cercocarpus brevifolius</i> .....	71	Clammy Locust .....	56
<i>Cercocarpus intricatus</i> .....	71	Cliff Elm .....	123
<i>Cercocarpus ledifolius</i> .....	71	<i>Cliftonia ligustrina</i> .....	86
<i>Cercocarpus ledifolius</i> , var. <i>intricatus</i> .....	71	<i>Clusia flava</i> .....	25
<i>Cercocarpus parvifolius</i> .....	71	<i>Clusia rosea</i> .....	25
<i>Cercocarpus parvifolius</i> , var. <i>glaber</i> .....	71	Coast Live Oak .....	147
<i>Cercocarpus parvifolius</i> , var. <i>paucidentatus</i> .....	71	<i>Coccoloba Floridana</i> .....	117
<i>Cereus giganteus</i> .....	89	<i>Coccoloba Loaganensis</i> .....	118
Chapote .....	105	<i>Coccoloba parvifolia</i> .....	117
<i>Chamaecyparis Boursierii</i> ( <i>Chamaecyparis Lawsoniana</i> ) .....	178	<i>Coccoloba uvifera</i> .....	118
<i>Chamaecyparis Boursierii</i> ( <i>Juniperus occidentalis</i> ) .....	181	<i>Coccoloba uvifera</i> , var. <i>Loaganensis</i> .....	118
<i>Chamaecyparis excelsa</i> .....	178	<i>Coccoloba uvifera</i> , var. <i>ovalifolia</i> .....	118
<i>Chamaecyparis Lawsoniana</i> .....	178	Cockspur Thorn .....	76
<i>Chamaecyparis Nutkaensis</i> .....	178	Cocoa Plum .....	65
<i>Chamaecyparis Nutkaensis</i> , var. <i>glauca</i> .....	178	Coffee Nut .....	58
<i>Chamaecyparis Nutkanus</i> .....	178	Coffee Tree, Kentucky .....	58
<i>Chamaecyparis sphaeroidea</i> .....	177	<i>Colubrina reclinata</i> .....	41
<i>Chamaecyparis Palmetto</i> .....	217	COMBRETACEÆ .....	87
<i>Chetranthodendron Californicum</i> .....	26	<i>Condalia ferrea</i> .....	39
Cherry .....	100	<i>Condalia obovata</i> .....	46
Cherry Birch .....	102	CONIFERÆ .....	176-210
Cherry, Indian .....	40	<i>Conocarpus acutifolia</i> .....	87
Cherry, May .....	84	<i>Conocarpus erecta</i> .....	87
Cherry, Pigeon .....	66	<i>Conocarpus erecta</i> , var. <i>procumbens</i> .....	87
Cherry, Pin .....	66	<i>Conocarpus procumbens</i> .....	87
Cherry, Rum .....	68	<i>Conocarpus racemosa</i> .....	87
Cherry, Wild ( <i>Prunus Capuli</i> ) .....	69	Coral Sumach .....	54
Cherry, Wild ( <i>Prunus demissa</i> ) .....	69	<i>Cordia Boissieri</i> .....	114
Cherry, Wild Black .....	68	<i>Cordia Floridana</i> .....	114
Cherry, Wild Red .....	66	? <i>Cordia juglandifolia</i> .....	113
Chestnut .....	157	<i>Cordia Sebestena</i> .....	113
Chestnut Oak ( <i>Quercus densiflora</i> ) .....	155	<i>Cordia speciosa</i> .....	113
Chestnut Oak ( <i>Quercus prinoides</i> ) .....	143	Cork Elm .....	123
Chestnut Oak ( <i>Quercus Prinus</i> ) .....	142	Corkwood .....	117
Chestnut Oak, Rock .....	142	CORNACEÆ .....	90-93
Chickasaw Plum .....	66	<i>Cornus alternata</i> .....	90
<i>Chilopsis glutinosa</i> .....	116	<i>Cornus alternifolia</i> .....	90

	Page.		Page.
<i>Cornus florida</i> .....	90	<i>Crataegus linearis</i> .....	77
<i>Cornus florida</i> ( <i>Cornus Nuttallii</i> ).....	91	<i>Crataegus lobata</i> ( <i>Crataegus flava</i> ).....	82
<i>Cornus Nuttallii</i> .....	91	<i>Crataegus lobata</i> ( <i>Crataegus tomentosa</i> ).....	79
<i>Corypha Palmetto</i> .....	217	<i>Crataegus lucida</i> ( <i>Crataegus festivals</i> ).....	82
<i>Cotinus Americanus</i> .....	52	<i>Crataegus lucida</i> ( <i>Crataegus Crus-galli</i> ).....	76
<i>Cotinus coggygria</i> .....	52	<i>Crataegus macracantha</i> .....	77
Cotton Gum.....	98	<i>Crataegus Michauxii</i> .....	83
Cottonwood ( <i>Populus Fremontii</i> ).....	175	<i>Crataegus microcarpa</i> .....	81
Cottonwood ( <i>Populus Fremontii</i> , var. <i>Wislizeni</i> ).....	175	<i>Crataegus mollis</i> .....	78
Cottonwood ( <i>Populus monilifera</i> ).....	175	<i>Crataegus obovatifolia</i> .....	80
Cottonwood, Balsam.....	174	<i>Crataegus opaca</i> .....	82
Cottonwood, Big.....	175	<i>Crataegus ovalifolia</i> .....	76
Cottonwood, Black ( <i>Populus angustifolia</i> ).....	174	<i>Crataegus oxyacantha</i> .....	81
Cottonwood, Black ( <i>Populus trichocarpa</i> ).....	174	<i>Crataegus oxyacantha</i> , var. <i>apifolia</i> .....	81
Cottonwood, River.....	172	<i>Crataegus parvifolia</i> .....	85
Cottonwood, Swamp.....	175	<i>Crataegus populifolia</i> ( <i>Crataegus coccinea</i> ).....	78
Cottonwood, White.....	175	<i>Crataegus populifolia</i> ( <i>Crataegus cordata</i> ).....	80
Cow Oak.....	141	<i>Crataegus prunellifolia</i> .....	76
Crab, American.....	72	<i>Crataegus prunifolia</i> .....	77
Crab Apple, American.....	72	<i>Crataegus punctata</i> .....	80
Crab Apple, Oregon.....	73	<i>Crataegus punctata</i> , var. <i>brevispina</i> .....	75
Crab Apple, Southern.....	72	<i>Crataegus punctata</i> , var. <i>rubra</i> and <i>aurea</i> .....	80.
Crab, Sweet-scented.....	72	<i>Crataegus punctata</i> , var. <i>acanthocarpa</i> .....	80.
Crabwood.....	121	<i>Crataegus pyrifolia</i> .....	79.
<i>Crataegus festivals</i> .....	82	<i>Crataegus racemosa</i> .....	84
<i>Crataegus apifolia</i> .....	81	<i>Crataegus rivularis</i> .....	74
<i>Crataegus arborescens</i> .....	75	<i>Crataegus rivularis</i> ( <i>Crataegus Douglasii</i> ).....	75.
<i>Crataegus arbutifolia</i> .....	83	<i>Crataegus salicifolia</i> .....	70.
<i>Crataegus berberifolia</i> .....	82	<i>Crataegus sanguinea</i> .....	75.
<i>Crataegus Boscinna</i> .....	77	<i>Crataegus sanguinea</i> , var. <i>Douglasii</i> ( <i>Crataegus Douglasii</i> ).....	75.
<i>Crataegus brachyacantha</i> .....	75	<i>Crataegus sanguinea</i> , var. <i>Douglasii</i> ( <i>Crataegus rivularis</i> ).....	74.
<i>Crataegus Caroliniana</i> .....	82	<i>Crataegus sanguinea</i> , var. <i>villosa</i> .....	78.
<i>Crataegus coccinea</i> .....	77	<i>Crataegus spathulata</i> .....	81
<i>Crataegus coccinea</i> ( <i>Crataegus tomentosa</i> ).....	77	<i>Crataegus spathulata</i> ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	83.
<i>Crataegus coccinea</i> , var. <i>cordata</i> .....	79	<i>Crataegus spicata</i> .....	85
<i>Crataegus coccinea</i> , var. <i>mollis</i> .....	78	<i>Crataegus subvillosa</i> .....	78
<i>Crataegus coccinea</i> var. <i>oligandra</i> .....	78	<i>Crataegus Texana</i> .....	78.
<i>Crataegus coccinea</i> , var. <i>populifolia</i> .....	78	<i>Crataegus tomentosa</i> .....	79.
<i>Crataegus coccinea</i> , var. <i>typica</i> .....	78	<i>Crataegus tomentosa</i> ( <i>Amelanchier Canadensis</i> ).....	84.
<i>Crataegus coccinea</i> , var. <i>viridis</i> .....	78	<i>Crataegus tomentosa</i> , var. <i>mollis</i> .....	78.
? <i>Crataegus coccinea</i> , var. <i>viridis</i> ( <i>Crataegus tomentosa</i> ).....	79	<i>Crataegus tomentosa</i> , var. <i>plicata</i> .....	80.
<i>Crataegus cordata</i> .....	80	<i>Crataegus tomentosa</i> , var. <i>punctata</i> .....	80
<i>Crataegus coronaria</i> .....	72	<i>Crataegus tomentosa</i> , var. <i>pyrifolia</i> .....	79.
<i>Crataegus Coursetiana</i> .....	70	<i>Crataegus turbinata</i> .....	82
<i>Crataegus Crus-galli</i> .....	70	<i>Crataegus Virginica</i> .....	83.
<i>Crataegus Crus-galli</i> ( <i>Crataegus coccinea</i> ).....	77	<i>Crataegus viridis</i> ( <i>Crataegus coccinea</i> ).....	78.
<i>Crataegus Crus-galli</i> ( <i>Crataegus tomentosa</i> , var. <i>punctata</i> ).....	80	<i>Crataegus viridis</i> ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	83.
<i>Crataegus Crus-galli</i> , var. <i>linearis</i> .....	76	<i>Crataegus Watsoniana</i> .....	70.
<i>Crataegus Crus-galli</i> , var. <i>ovalifolia</i> .....	76	<i>Crescentia cucurbitina</i> .....	110
<i>Crataegus Crus-galli</i> , var. <i>prunifolia</i> .....	77	<i>Crescentia latifolia</i> .....	116.
<i>Crataegus Crus-galli</i> , var. <i>pyracanthifolia</i> .....	76	<i>Crescentia lethifera</i> .....	116
<i>Crataegus Crus-galli</i> , var. <i>pyracanthifolia</i> ( <i>Crataegus arborescens</i> ).....	75	<i>Crescentia obovata</i> .....	116.
<i>Crataegus Crus-galli</i> , var. <i>salicifolia</i> .....	76	<i>Crescentia ovata</i> .....	116.
<i>Crataegus Crus-galli</i> , var. <i>splendens</i> .....	76	<i>Crescentia toxicaria</i> .....	116.
<i>Crataegus cuneifolia</i> .....	80	Cucumber Tree ( <i>Magnolia acuminata</i> ).....	20
<i>Crataegus Douglasii</i> .....	75	Cucumber Tree ( <i>Magnolia cordata</i> ).....	21
<i>Crataegus elliptica</i> ( <i>Crataegus festivals</i> ).....	82	Cucumber Tree, Large-leaved.....	21.
<i>Crataegus elliptica</i> ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	83	Cucumber Tree, Long-leaved.....	22.
<i>Crataegus flava</i> .....	83	<i>Cupressinmata disticha</i> .....	183.
<i>Crataegus flava</i> ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	83	<i>Cupressus Americana</i> .....	178
<i>Crataegus flava</i> ( <i>Crataegus tomentosa</i> ).....	79	<i>Cupressus Arbor-vitae</i> .....	176.
<i>Crataegus flava</i> ( <i>Crataegus tomentosa</i> , var. <i>punctata</i> ).....	80	<i>Cupressus Arizonica</i> .....	180.
<i>Crataegus flava</i> , var. <i>lobata</i> .....	82	? <i>Cupressus attenuata</i> .....	178.
<i>Crataegus flava</i> , var. <i>pubescens</i> .....	83	? <i>Cupressus Californica</i> .....	179.
? <i>Crataegus fuscata</i> .....	80	<i>Cupressus Californica gracilis</i> ( <i>Cupressus Goveniana</i> ).....	179.
<i>Crataegus glandulosa</i> ( <i>Crataegus coccinea</i> ).....	77	<i>Cupressus Californica gracilis</i> ( <i>Cupressus Macnabiana</i> ).....	180
? <i>Crataegus glandulosa</i> ( <i>Crataegus Douglasii</i> ).....	77	? <i>Cupressus cornuta</i> .....	179.
<i>Crataegus glandulosa</i> ( <i>Crataegus flava</i> ).....	75	<i>Cupressus disticha</i> .....	183.
<i>Crataegus glandulosa</i> ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	83	<i>Cupressus disticha</i> , var. <i>imbriearia</i> .....	183.
<i>Crataegus glandulosa</i> , var. <i>macracantha</i> .....	77	<i>Cupressus disticha</i> , var. <i>nutans</i> .....	183.
<i>Crataegus glandulosa</i> , var. <i>rotundifolia</i> .....	78	<i>Cupressus disticha</i> , var. <i>patens</i> .....	183.
<i>Crataegus latifolia</i> ( <i>Crataegus tomentosa</i> ).....	78	<i>Cupressus fragrans</i> .....	178.
<i>Crataegus latifolia</i> ( <i>Crataegus tomentosa</i> , var. <i>punctata</i> ).....	80	<i>Cupressus glandulosa</i> .....	186
<i>Crataegus leucocephalus</i> .....	79	<i>Cupressus Goveniana</i> .....	179.
<i>Crataegus leucophloos</i> .....	79	<i>Cupressus Guadalupensis</i> .....	184.

	Page.		Page.
<i>Cupressus Hartwegii</i> .....	179	<i>Drypetes sessiliflora</i> .....	120
? <i>Cupressus Hartwegii</i> , var. <i>fastigiata</i> .....	179	Duck Oak.....	152
<i>Cupressus Lambertiana</i> .....	179	Dwarf Maple.....	48
<i>Cupressus Lawsoniana</i> .....	178	Dwarf Sumach.....	53
<i>Cupressus Macnabiana</i> .....	180		
<i>Cupressus macrocarpa</i> .....	179	<b>E.</b>	
<i>Cupressus macrocarpa</i> ? ( <i>Cupressus Guadalupeensis</i> ).....	180	<b>EBENACEÆ</b> .....	104, 105
? <i>Cupressus macrocarpa</i> , var. <i>fastigiata</i> .....	179	<i>Ehretia Bourreria</i> .....	114
<i>Cupressus Nootkatensis</i> .....	178	<i>Ehretia elliptica</i> .....	114
<i>Cupressus Nutkaensis</i> .....	178	<i>Ehretia Iiavanensis</i> .....	114
<i>Cupressus thyoides</i> .....	177	<i>Ehretia radula</i> .....	114
<b>CURULIFERÆ</b> .....	137-159	<i>Ehretia tomentosa</i> .....	114
Custard Apple.....	23	<i>Elaphrium integerrimum</i> .....	32
Cypress, Bald.....	184	Elder ( <i>Sambucus glauca</i> ).....	93
Cypress, Black.....	184	Elder ( <i>Sambucus Mexicana</i> ).....	94
Cypress, Deciduous.....	184	Elder, Box ( <i>Negundo aceroides</i> ).....	51
Cypress, Lawson's.....	179	Elder, Box ( <i>Negundo Californicum</i> ).....	51
Cypress, Monterey.....	170	Elder, Poison.....	54
Cypress, Red.....	184	Elomi, Gum.....	38
Cypress, Sitka.....	178	Elkwood.....	21
Cypress, White.....	184	Elm, American.....	123
Cypress, Yellow.....	178	Elm, Cedar.....	123
<b>CYRILLACEÆ</b> .....	37, 38	Elm, Cliff.....	123
<i>Cyrilla Caroliniana</i> .....	37	Elm, Cork.....	123
<i>Cyrilla fuscata</i> .....	37	Elm, Hickory.....	123
<i>Cyrilla paniculata</i> .....	100	Elm, Moose.....	122
<i>Cyrilla parvifolia</i> .....	37	Elm, Red.....	122
<i>Cyrilla polystachia</i> .....	37	Elm, Rock.....	123
<i>Cyrilla racemiflora</i> .....	37	Elm, Slippery ( <i>Fremontia Californica</i> ).....	26
<i>Cyrilla racemosa</i> .....	37	Elm, Slippery ( <i>Ulmus fulva</i> ).....	122
		Elm, Water.....	123
<b>D.</b>		Elm, White ( <i>Ulmus Americana</i> ).....	123
Dahoon.....	35	Elm, White ( <i>Ulmus racemosa</i> ).....	123
Dahoon Holly.....	35	Elm, Winged.....	124
<i>Dalea spinosa</i> .....	53	<i>Emetila ramulosa</i> .....	36
Darling Plum.....	39	<i>Enceno</i> .....	147
<i>Datiscia hirta</i> .....	52	<i>Endotropis oleifolia</i> .....	40
Deciduous Cypress.....	184	<b>ERICACEÆ</b> .....	96-99
<i>Dermatophyllum speciosum</i> .....	57	<i>Erythrina piscipula</i> .....	57
Desert Willow.....	116	<i>Eugenia axillaris</i> .....	80
Devilwood.....	113	<i>Eugenia Baruensis</i> .....	80
Diamond Willow.....	170	<i>Eugenia buxifolia</i> .....	88
Digger Pine.....	195	<i>Eugenia dichotoma</i> .....	88
Dilly, Wild.....	103	<i>Eugenia dichotoma</i> , var. <i>fragrans</i> .....	88
<i>Diospyros angustifolia</i> .....	104	<i>Eugenia divaricata</i> .....	88
<i>Diospyros calycina</i> .....	104	<i>Eugenia longipes</i> .....	80
<i>Diospyros ciliata</i> .....	104	<i>Eugenia montana</i> .....	88
<i>Diospyros concolor</i> .....	104	<i>Eugenia monticola</i> .....	80
<i>Diospyros Guaiacana</i> .....	104	<i>Eugenia myrtoides</i> .....	88
<i>Diospyros intermedia</i> .....	104	<i>Eugenia pallens</i> .....	88
<i>Diospyros lucida</i> .....	104	<i>Eugenia procera</i> .....	80
<i>Diospyros Persimon</i> .....	104	<i>Eugenia pungens</i> .....	88
<i>Diospyros pubescens</i> .....	104	<i>Eugenia triplinervia</i> ( <i>Eugenia buxifolia</i> ).....	88
<i>Diospyros Texana</i> .....	104	<i>Eugenia triplinervia</i> ( <i>Eugenia monticola</i> ).....	80
<i>Diospyros Virginiana</i> .....	104	<i>Euonymus atropurpureus</i> .....	38
<i>Diospyros Virginiana</i> , var. <i>concolor</i> .....	104	<i>Euonymus Carolinensis</i> .....	38
<i>Diospyros Virginiana</i> , var. <i>macrocarpa</i> .....	104	<i>Euonymus latifolius</i> .....	38
<i>Diospyros Virginiana</i> , var. <i>microcarpa</i> .....	104	<b>EUPHORBIACEÆ</b> .....	120, 121
<i>Diospyros Virginiana</i> , var. <i>pubescens</i> .....	104	<i>Excoecaria lucida</i> .....	121
<i>Diphollis salicifolia</i> .....	101	<i>Exostemma Caribæum</i> .....	95
Doctor Gum.....	54	<i>Ewothea oblongifolia</i> .....	45
Dogwood.....	90	<i>Eysenhardtia amorphoides</i> .....	55
Dogwood, Flowering ( <i>Cornus florida</i> ).....	91	<i>Eysenhardtia amorphoides</i> , var. <i>orthocarpa</i> .....	55
Dogwood, Flowering ( <i>Cornus Nuttallii</i> ).....	91	<i>Eysenhardtia orthocarpa</i> .....	55
Dogwood, Jamaica.....	57		
Dogwood, Striped.....	46	<b>F.</b>	
Douglas Fir.....	200	<i>Fagara fraxinifolia</i> .....	30
Downward Plum.....	103	<i>Fagara lentisifolia</i> .....	31
<i>Drimophyllum pauciflorum</i> .....	120	<i>Fagara Pterota</i> .....	31
<i>Drypetes alba</i> , var. <i>latifolia</i> .....	121	<i>Fagus alba</i> .....	157
<i>Drypetes crocea</i> .....	120	<i>Fagus Americana</i> .....	157
<i>Drypetes crocea</i> , var. <i>latifolia</i> .....	121	<i>Fagus Americana latifolia</i> .....	157
<i>Drypetes crocea</i> , var. <i>longipes</i> .....	120	<i>Fagus Castanea</i> .....	157
<i>Drypetes glauca</i> ( <i>Drypetes crocea</i> ).....	120	<i>Fagus Castanea dentata</i> .....	157
<i>Drypetes glauca</i> ( <i>Drypetes crocea</i> , var. <i>latifolia</i> ).....	121	<i>Fagus Castanea pumila</i> .....	156
		<i>Fagus ferruginea</i> .....	157

	Page.		Page.
<i>Fagus ferruginea</i> , var. <i>Caroliniana</i> .....	157	<i>Fraxinus excelsior</i> .....	110
<i>Fagus pumila</i> .....	50	<i>Fraxinus expansa</i> .....	100
<i>Fagus pumila</i> , var. <i>præcox</i> .....	150	<i>Fraxinus fusca</i> .....	112
<i>Fagus sylvatica</i> .....	157	<i>Fraxinus grandifolia</i> .....	111
<i>Fagus sylvatica atropurpurea</i> .....	157	<i>Fraxinus Greggii</i> .....	100
<i>Fagus sylvatica</i> , var. <i>Americana</i> .....	157	? <i>Fraxinus juglandifolia</i> ( <i>Fraxinus Americana</i> ) .....	107
<i>Fagus sylvestris</i> .....	157	<i>Fraxinus juglandifolia</i> ( <i>Fraxinus viridis</i> ) .....	100
Fan-leaf Palm .....	217	? <i>Fraxinus juglandifolia</i> , var. <i>serrata</i> .....	107
Farkleberry .....	96	<i>Fraxinus juglandifolia</i> , var. <i>subintegerrima</i> .....	100
Fetid Buckeye .....	42	? <i>Fraxinus juglandifolia</i> , var. <i>subserrata</i> .....	107
<i>Ficus aurea</i> .....	126	<i>Fraxinus lanoca</i> .....	107
<i>Ficus aurea</i> , var. <i>latifolia</i> .....	126	<i>Fraxinus longifolia</i> .....	108
<i>Ficus brevifolia</i> .....	127	<i>Fraxinus mixta</i> .....	112
<i>Ficus complicata</i> .....	127	<i>Fraxinus nervosa</i> .....	110
<i>Ficus pedunculata</i> .....	127	<i>Fraxinus nigra</i> .....	112
Fiddlewood .....	116	<i>Fraxinus nigra</i> ( <i>Fraxinus pubescens</i> ) .....	108
Fig, Wild .....	127	<i>Fraxinus nigra</i> ( <i>Fraxinus sambucifolia</i> ) .....	111
Fir, Balm of Gilead .....	211	<i>Fraxinus nigrescens</i> .....	10
Fir, Balsam ( <i>Abies balsamea</i> ) .....	211	<i>Fraxinus Nova-Angliæ</i> ( <i>Fraxinus sambucifolia</i> ) .....	111
Fir, Balsam ( <i>Abies concolor</i> ) .....	213	<i>Fraxinus Nova-Angliæ</i> ( <i>Fraxinus viridis</i> ) .....	109
Fir, Douglas .....	200	<i>Fraxinus Nuttallii</i> .....	110
Fir, Red ( <i>Abies magnifica</i> ) .....	214	<i>Fraxinus oblongocarpa</i> .....	108
Fir, Red ( <i>Abies nobilis</i> ) .....	214	<i>Fraxinus Oregon</i> .....	111
Fir, Red ( <i>Pseudotsuga Douglasii</i> ) .....	200	<i>Fraxinus ovata</i> .....	112
Fir, White ( <i>Abies concolor</i> ) .....	213	<i>Fraxinus pallida</i> .....	110
Fir, White ( <i>Abies grandis</i> ) .....	212	<i>Fraxinus pannosa</i> .....	112
Fir, Yellow .....	200	<i>Fraxinus pauciflora</i> .....	110
Flowering Dogwood ( <i>Cornus florida</i> ) .....	91	<i>Fraxinus Pennsylvanica</i> .....	108
Flowering Dogwood ( <i>Cornus Nuttallii</i> ) .....	91	<i>Fraxinus pistaciifolia</i> .....	106
<i>Fetidaurus montana</i> .....	186	<i>Fraxinus pistaciifolia</i> ( <i>Fraxinus Americana</i> , var. <i>Texensis</i> ) .....	108
<i>Fetidaurus Myristica</i> .....	186	<i>Fraxinus pistaciifolia</i> , var. <i>coriacea</i> .....	106
<i>Forestiera acuminata</i> .....	112	<i>Fraxinus platycarpa</i> .....	110
Forked-leaf Black Jack .....	151	<i>Fraxinus pubescens</i> .....	108
Foxtail Pine .....	191	<i>Fraxinus pubescens</i> .....	110
<i>Frangula Californica</i> .....	40	<i>Fraxinus pubescens</i> , var. .....	111
<i>Frangula Californica</i> , var. <i>tomentella</i> .....	41	<i>Fraxinus pubescens</i> , var. <i>latifolia</i> .....	108
<i>Frangula Caroliniana</i> .....	40	<i>Fraxinus pubescens</i> , var. <i>longifolia</i> .....	108
? <i>Frangula fragilis</i> .....	40	<i>Fraxinus pubescens</i> , var. <i>subpubescens</i> .....	108
<i>Frangula Purshiana</i> .....	41	<i>Fraxinus pulverulenta</i> .....	112
Franklinia .....	26	<i>Fraxinus quadrangularis</i> .....	110
<i>Franklinia Alataamaha</i> .....	25	<i>Fraxinus quadrangulata</i> .....	110
<i>Fraxinus acuminata</i> .....	107	<i>Fraxinus quadrangulata</i> , var. <i>nervosa</i> .....	110
<i>Fraxinus alba</i> .....	112	<i>Fraxinus Richardi</i> .....	112
<i>Fraxinus alba</i> ( <i>Fraxinus Americana</i> ) .....	107	<i>Fraxinus rubicunda</i> .....	112
<i>Fraxinus albicans</i> ( <i>Fraxinus Americana</i> , var. <i>microcarpa</i> ) .....	108	<i>Fraxinus rufa</i> .....	112
<i>Fraxinus albicans</i> ( <i>Fraxinus Americana</i> , var. <i>Texensis</i> ) .....	108	<i>Fraxinus sambucifolia</i> .....	111
<i>Fraxinus Americana</i> .....	107	<i>Fraxinus sambucifolia</i> , var. <i>crispa</i> .....	111
<i>Fraxinus Americana</i> ( <i>Fraxinus platycarpa</i> ) .....	110	<i>Fraxinus Schiedeana</i> , var. <i>parvifolia</i> .....	106
<i>Fraxinus Americana</i> , var. <i>Caroliniana</i> .....	110	<i>Fraxinus subvillosa</i> .....	108
<i>Fraxinus Americana</i> , var. <i>juglandifolia</i> .....	109	<i>Fraxinus tetragona</i> .....	110
<i>Fraxinus Americana</i> , var. <i>latifolia</i> .....	107	<i>Fraxinus tomentosa</i> .....	108
<i>Fraxinus Americana</i> , var. <i>microcarpa</i> .....	108	<i>Fraxinus triolata</i> .....	109
<i>Fraxinus Americana</i> , var. <i>pubescens</i> .....	108	<i>Fraxinus triptera</i> .....	110
<i>Fraxinus Americana</i> , var. <i>quadrangulata</i> .....	110	<i>Fraxinus velutina</i> .....	106
<i>Fraxinus Americana</i> , var. <i>quadrangulata nervosa</i> .....	110	<i>Fraxinus viridis</i> .....	100
<i>Fraxinus Americana</i> , var. <i>sambucifolia</i> .....	111	<i>Fraxinus viridis</i> , var. <i>Berlandieriana</i> .....	109
<i>Fraxinus Americana</i> , var. <i>Texensis</i> .....	108	Fremontia Californica .....	26
<i>Fraxinus Americana</i> , var. <i>triptera</i> .....	110	Frigolito .....	58
<i>Fraxinus anomala</i> .....	108	Fringo Tree .....	113
<i>Fraxinus Berlandieriana</i> .....	109		
<i>Fraxinus Canadensis</i> .....	107	<b>G.</b>	
? <i>Fraxinus Caroliniana</i> ( <i>Fraxinus platycarpa</i> ) .....	110	<i>Gardenia clusiae-folia</i> .....	95
? <i>Fraxinus Caroliniana</i> ( <i>Fraxinus viridis</i> ) .....	109	Geiger Tree .....	113
<i>Fraxinus Carolinensis</i> .....	107	<i>Genipa clusiae-folia</i> .....	95
<i>Fraxinus cinerea</i> .....	112	Georgia Bark .....	95
<i>Fraxinus coriacea</i> ( <i>Fraxinus Americana</i> , var. <i>Texensis</i> ) .....	108	Georgia Pine .....	202
<i>Fraxinus coriacea</i> ( <i>Fraxinus pistaciifolia</i> ) .....	106	Gift Cactus .....	90
<i>Fraxinus crispa</i> .....	111	<i>Gigantabies taxifolia</i> .....	185
<i>Fraxinus Curtissii</i> .....	108	<i>Gigantabies Wellingtonia</i> .....	184
<i>Fraxinus curvidens</i> .....	110	Ginger Pine .....	179
<i>Fraxinus cuspidata</i> .....	112	Glaberry .....	28
<i>Fraxinus dipetala</i> .....	112	Glaucous Willow .....	100
<i>Fraxinus discolor</i> .....	107	<i>Gleditschia aquatica</i> .....	59
<i>Fraxinus elliptica</i> .....	112	<i>Gleditschia brachycarpa</i> .....	59
<i>Fraxinus eriptera</i> .....	107	<i>Gleditschia Carolinensis</i> .....	59
		<i>Gleditschia elegans</i> .....	59

<i>Gleditschia inermis</i> ( <i>Gleditschia monosperma</i> ).....	59
<i>Gleditschia inermis</i> ( <i>Gleditschia triacanthos</i> , var. <i>inermis</i> ).....	59
<i>Gleditschia maecantha</i> .....	59
<i>Gleditschia Melikoba</i> .....	59
<i>Gleditschia monosperma</i> .....	59
<i>Gleditschia spinosa</i> .....	59
<i>Gleditschia triacantha</i> .....	59
<i>Gleditschia triacanthos</i> .....	59
<i>Gleditschia triacanthos</i> , var. <i>brachycarpus</i> .....	59
<i>Gleditschia triacanthos</i> , var. <i>inermis</i> .....	59
<i>Gleditschia triacanthos</i> , var. <i>monosperma</i> .....	59
Goose-foot Maple.....	40
Gopher Plum.....	91
Gopherwood.....	57
<i>Gordonia Frankkni</i> .....	25
<i>Gordonia Lasianthus</i> .....	25
<i>Gordonia pubescens</i> .....	25
<i>Gordonia pyramidalis</i> .....	25
Grape, Sea.....	118
Gray Birch ( <i>Betula alba</i> , var. <i>populifolia</i> ).....	159
Gray Birch ( <i>Betula lutea</i> ).....	101
Gray Pine.....	201
Great Laurel.....	90
Green Ash.....	100
Green-bark Acaia.....	60
Ground Ash.....	111
<i>Guaiacum angustifolium</i> .....	29
<i>Guaiacum sanctum</i> .....	28
<i>Guaiacum verticale</i> .....	28
<i>Guettarda elliptica</i> .....	96
<i>Guettarda Blodgettii</i> .....	96
Guiana Plum.....	121
<i>Guilandina dioica</i> .....	58
Gum, Black.....	92
Gum, Colton.....	93
Gum, Doctor.....	54
Gum Elastic.....	102
Gum Elomi.....	33
Gum, Red.....	86
Gum, Sour.....	92
Gum, Star-leaved.....	80
Gum, Sweet.....	86
Gum, Tupelo.....	93
Gumbo Limbo.....	33
Gurgoon Stopper.....	88
GUTTIFERÆ.....	25
<i>Gymnanthes lucida</i> .....	121
<i>Gymnocalanus Catesbyana</i> .....	119
<i>Gymnocladus Canadensis</i> .....	58
<i>Gymnocladus dioica</i> .....	58

III.

Hackberry ( <i>Celtis occidentalis</i> ).....	126
Hackberry ( <i>Celtis occidentalis</i> , var. <i>reticulata</i> ).....	126
Hackmatack.....	215
<i>Halesia diptera</i> .....	105
<i>Halesia parviflora</i> .....	100
<i>Halesia reticulata</i> .....	105
<i>Halesia tetraptera</i> .....	106
<i>Halmia cornifolia</i> .....	80
<i>Halmia flabellata</i> .....	77
<i>Halmia lobata</i> .....	79
<i>Halmia punctata</i> .....	80
<i>Halmia tomentosa</i> .....	79
HAMAMELACEÆ.....	85, 86
<i>Hamamelis androgyna</i> .....	85
<i>Hamamelis corylifolia</i> .....	85
<i>Hamamelis dioica</i> .....	85
<i>Hamamelis macrophylla</i> .....	85
<i>Hamamelis parvifolia</i> .....	85
<i>Hamamelis Virginiana</i> , var. <i>parvifolia</i> .....	85
<i>Hamamelis Virginica</i> .....	85
Hard Maple.....	43
Hard Pine.....	202
Haw, Apple.....	82
Haw, Black.....	94
Haw, Hogs'.....	75
Haw, May.....	82
Haw, Parsley.....	81
Haw, Pear.....	79
Haw, Purple.....	40
Haw, Red ( <i>Crataegus coccinea</i> ).....	78
Haw, Red ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	83
Haw, Scarlet ( <i>Crataegus coccinea</i> ).....	78
Haw, Scarlet ( <i>Crataegus subvillosa</i> ).....	78
Haw, Small-fruited.....	81
Haw, Summer ( <i>Crataegus flava</i> ).....	83
Haw, Summer ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	88
Haw, Yellow.....	83
Hazel, Witch.....	85
Hemlock ( <i>Pseudotsuga Douglasii</i> , var. <i>macrocarpa</i> ).....	210
Hemlock ( <i>Tsuga Canadensis</i> ).....	207
Hemlock ( <i>Tsuga Caroliniana</i> ).....	207
Hemlock ( <i>Tsuga Mertensiana</i> ).....	208
<i>Heteromeles arbutifolia</i> .....	83
<i>Heteromeles Fremontiana</i> .....	83
<i>Heyderia decurrens</i> .....	176
<i>Heymassoli spinosa</i> .....	34
<i>Hickorea</i> , species.....	132
<i>Hickorius amara</i> .....	135
Hickory, Big-bud.....	134
Hickory, Black ( <i>Carya porcina</i> ).....	134
Hickory, Black ( <i>Carya tomentosa</i> ).....	134
Hickory, Brown.....	134
Hickory Elm.....	123
Hickory, Nutmeg.....	135
Hickory Pine ( <i>Pinus Balfouriana</i> , var. <i>aristata</i> ).....	191
Hickory Pine ( <i>Pinus pungens</i> ).....	190
Hickory, Shag-bark.....	133
Hickory, Shell-bark.....	133
Hickory, Swamp ( <i>Carya amara</i> ).....	135
Hickory, Swamp ( <i>Carya aquatica</i> ).....	136
Hickory, Switch-bud.....	134
Hickory, Water.....	136
Hickory, White-heart.....	134
<i>Hicorius integrifolia</i> .....	135
<i>Hierophyllus Cassine</i> .....	36
Hippomane Mancinella.....	121
Hoary Alder.....	105
Hog Plum ( <i>Prunus angustifolia</i> ).....	66
Hog Plum ( <i>Rhus Metopium</i> ).....	54
Hog Plum ( <i>Ximonia Americana</i> ).....	34
Hogs' Haw.....	75
Holly, American.....	35
Holly, California.....	84
Holly, Dahoon.....	35
Honey Locust ( <i>Gleditschia triacanthos</i> ).....	59
Honey Locust ( <i>Prosopis juliflora</i> ).....	62
Honey Pod.....	62
Honey Shucks.....	59
Hoop Ash.....	111
<i>Hopea tinctoria</i> .....	105
Hop Hornbeam.....	158
Hop Tree.....	31
Hornbeam.....	159
Hornbeam, Hop.....	158
Horse Plum.....	65
Horse Sugar.....	105
<i>Hypelate oblongifolia</i> .....	45
<i>Hypelate paniculata</i> .....	45
<i>Hypelate trifoliata</i> .....	45
<i>Hyperanthera dioica</i> .....	58
<i>Hypericum Lasianthus</i> .....	26

I.

<i>Ilex cestivalis</i> .....	87
<i>Ilex ambiguus</i> .....	87
<i>Ilex angustifolia</i> .....	35
<i>Ilex aquifolium</i> .....	35
<i>Ilex Canadensis</i> .....	85

	Page.		Page.
<i>Ilex Cassena</i> .....	36	<i>Juglans angustifolia</i> ( <i>Carya olivæformis</i> ) .....	182
<i>Ilex Cassine</i> .....	36	<i>Juglans aquatica</i> .....	185
<i>Ilex Cassine</i> ( <i>Ilex Dahoon</i> ) .....	35	<i>Juglans Californica</i> .....	181
<i>Ilex Cassine</i> , <i>β.</i> (?) .....	36	<i>Juglans cathartica</i> .....	130
<i>Ilex Cassine</i> , var. <i>angustifolia</i> .....	35	<i>Juglans cinerea</i> .....	130
<i>Ilex Cassine</i> , var. <i>latifolia</i> .....	35	<i>Juglans compressa</i> .....	132
<i>Ilex cassinoides</i> .....	35	<i>Juglans cordiformis</i> .....	135
<i>Ilex Dahoon</i> .....	35	<i>Juglans cylindrica</i> .....	132
<i>Ilex Dahoon</i> , var. <i>angustifolia</i> .....	35	? <i>Juglans exaltata</i> .....	132
<i>Ilex Dahoon</i> , var. <i>myrtifolia</i> .....	36	<i>Juglans glabra</i> .....	134
<i>Ilex decidua</i> .....	37	<i>Juglans Illinoisensis</i> .....	132
<i>Ilex Floridana</i> .....	36	<i>Juglans laciniosa</i> .....	133
<i>Ilex laurifolia</i> .....	35	<i>Juglans mucronata</i> .....	133
<i>Ilex laxiflora</i> .....	36	<i>Juglans myristiceiformis</i> .....	135
<i>Ilex ligustrifolia</i> .....	36	<i>Juglans nigra</i> .....	131
<i>Ilex ligustrina</i> ( <i>Ilex Cassine</i> ) .....	36	<i>Juglans nigra oblonga</i> .....	131
<i>Ilex ligustrina</i> ( <i>Ilex Dahoon</i> , var. <i>angustifolia</i> ) .....	36	<i>Juglans obovata</i> .....	134
<i>Ilex myrtifolia</i> .....	36	<i>Juglans oblonga</i> .....	130
<i>Ilex opaca</i> .....	34	<i>Juglans oblonga alba</i> .....	130
<i>Ilex prinoides</i> .....	37	<i>Juglans olivæformis</i> .....	132
<i>Ilex quercifolia</i> .....	35	<i>Juglans ovalis</i> .....	132
<i>Ilex religiosa</i> .....	36	<i>Juglans ovata</i> .....	132
<i>Ilex rosmarifolia</i> .....	36	<i>Juglans Pecan</i> .....	132
<i>Ilex vomitoria</i> .....	36	<i>Juglans porcina</i> .....	134
? <i>Ilex Watsoniana</i> .....	36	<i>Juglans porcina</i> , var. <i>obovata</i> .....	134
IGLUCINEÆ		<i>Juglans porcina</i> , var. <i>pisiformis</i> .....	134
Illinois Nut .....	132	<i>Juglans pyriformis</i> .....	134
Incense Cedar .....	176	<i>Juglans rubra</i> .....	132
Indian Benn .....	115	<i>Juglans rupestris</i> .....	131
Indian Cherry .....	40	<i>Juglans rupestris</i> , var. <i>major</i> .....	131
India-rubber Tree .....	127	<i>Juglans squamosa</i> .....	132
<i>Inga forficæ</i> .....	64	<i>Juglans sulcata</i> .....	133
<i>Inga Guadalupeensis</i> .....	64	<i>Juglans tomentosa</i> .....	134
<i>Inga microphylla</i> .....	64	Juneberry .....	84
<i>Inga rosea</i> .....	64	Juniper ( <i>Juniperus Californica</i> ) .....	180
<i>Inga Unguis-cati</i> .....	64	Juniper ( <i>Juniperus Californica</i> , var. <i>Utahensis</i> ) .....	181
Inkwood .....	45	Juniper ( <i>Juniperus occidentalis</i> ) .....	182
<i>Isxylon pomiferum</i> .....	128	Juniper ( <i>Juniperus occidentalis</i> , var. <i>conjugens</i> ) .....	182
Iron oak .....	139	Juniper ( <i>Juniperus occidentalis</i> , var. <i>monosperma</i> ) .....	182
Ironwood ( <i>Bumelia lycioides</i> ) .....	103	Juniper ( <i>Juniperus pachyphloea</i> ) .....	181
Ironwood ( <i>Carpinus Caroliniana</i> ) .....	159	<i>Juniperus Andina</i> .....	181
Ironwood ( <i>Cliftonia ligustrina</i> ) .....	38	<i>Juniperus arborescens</i> .....	182
Ironwood ( <i>Cyrilla racemiflora</i> ) .....	37	? <i>Juniperus aromatica</i> .....	170
Ironwood ( <i>Hypelate paniculata</i> ) .....	45	<i>Juniperus Barbadosensis</i> .....	182
Ironwood ( <i>Olneya Tesota</i> ) .....	56	<i>Juniperus Californica</i> .....	180
Ironwood ( <i>Ostrya Virginica</i> ) .....	158	<i>Juniperus Californica</i> , var. <i>osteosperma</i> .....	180
Ironwood, Black .....	39	<i>Juniperus Californica</i> , var. <i>Utahensis</i> .....	180
Ironwood, Red .....	39	<i>Juniperus Caroliniana</i> .....	182
Ironwood, White .....	45	<i>Juniperus Cerasianus</i> .....	180
Isley .....	70	<i>Juniperus excelsa</i> .....	181
<i>Itea Cyrilla</i> .....	37	<i>Juniperus fœtida</i> , var. <i>Virginiana</i> .....	182
Ivy .....	98	<i>Juniperus Hermannii</i> ( <i>Juniperus occidentalis</i> ) .....	181
<b>J.</b>			
Jack, Black ( <i>Quercus Catesbaei</i> ) .....	151	<i>Juniperus Hermannii</i> ( <i>Juniperus Virginiana</i> ) .....	182
Jack, Black ( <i>Quercus nigra</i> ) .....	150	<i>Juniperus occidentalis</i> .....	181
Jack, Blue .....	153	<i>Juniperus occidentalis</i> ( <i>Juniperus Californica</i> ) .....	180
Jack, Forked-leaved Black .....	151	<i>Juniperus occidentalis</i> ( <i>Juniperus Californica</i> , var. <i>Utahensis</i> ) .....	180
Jack Oak .....	150	<i>Juniperus occidentalis</i> , var. <i>conjugens</i> .....	182
Jack, Sand .....	153	<i>Juniperus occidentalis</i> , var. <i>monosperma</i> .....	181
Jacquinia armillaris .....	100	<i>Juniperus occidentalis</i> , var. <i>pletosperma</i> .....	181
Jamaica Dogwood .....	57	<i>Juniperus occidentalis</i> , var. <i>Utahensis</i> .....	180
Jersey Pine .....	100	<i>Juniperus pachyphloea</i> .....	181
Joewood .....	100	<i>Juniperus plectroderma</i> .....	181
Joshua, The .....	219	<i>Juniperus pyriformis</i> .....	181
Joshua Tree .....	219	<i>Juniperus Sabina pachyphloea</i> .....	181
Judas Tree .....	61	<i>Juniperus Sabina</i> , var. <i>Virginiana</i> .....	182
JUGLANDACEÆ		<i>Juniperus tetragona</i> ( <i>Juniperus Californica</i> ) .....	180
<i>Juglans alba</i> ( <i>Carya alba</i> ) .....	133	<i>Juniperus tetragona</i> , var. <i>osteosperma</i> .....	180
<i>Juglans alba</i> ( <i>Carya tomentosa</i> ) .....	133	<i>Juniperus Virginiana</i> .....	182
<i>Juglans alba acuminata</i> .....	134	<i>Juniperus Virginiana</i> , var. <i>Caroliniana</i> .....	182
<i>Juglans alba minima</i> .....	135	<i>Juniperus Virginiana</i> , var. <i>Hermannii</i> .....	182
<i>Juglans alba ovata</i> .....	132	<i>Juniperus Virginiana vulgaris</i> .....	182
<i>Juglans amara</i> .....	135	<b>K.</b>	
<i>Juglans angustifolia</i> ( <i>Carya amara</i> ) .....	135	<i>Kalmia latifolia</i> .....	98
		<i>Kampania fraginifolia</i> .....	80
		Kentucky Coffee Tree .....	68

	Page.		Page.
King Nut.....	184	Loblolly Pine.....	197
Knackaway.....	114	Locust (Robinia Neo-Mexicana).....	56
Knob-cone Pine.....	190	Locust (Robinia Pseudacacia).....	55
<b>L.</b>			
<i>Lacathea florida</i> .....	25	Locust, Black ( <i>Gleditsia triacanthos</i> ).....	59
<i>Laguncularia glabrifolia</i> .....	87	Locust, Black (Robinia Pseudacacia).....	55
<i>Laguncularia racemosa</i> .....	87	Locust, Clammy.....	56
Lancewood.....	119	Locust, Honey ( <i>Gleditsia triacanthos</i> ).....	59
Larch.....	215	Locust, Honey ( <i>Prosopis juliflora</i> ).....	62
Larch, Black.....	215	Locust, Sweet.....	59
Large-leaved Cucumber Tree.....	21	Locust, Water.....	60
Large Tupelo.....	93	Locust, Yellow.....	55
Larix Americana.....	215	Lodge-pole Pine.....	195
<i>Larix Americana rubra</i> .....	215	Logwood.....	40
<i>Larix Americana</i> , var. <i>brevifolia</i> .....	216	Long-leaved Cucumber Tree.....	22
<i>Larix Americana</i> , var. <i>pendula</i> .....	215	Long-leaved Pine.....	202
<i>Larix Americana</i> , var. <i>prolifera</i> .....	215	<i>Lyonia arborea</i> .....	98
<i>Larix decidua</i> , var. <i>Americana</i> .....	215	<i>Lyonia ferruginea</i> .....	96
<i>Larix intermedia</i> .....	215	<i>Lyonia rigida</i> .....	96
Larix Lyrallii.....	216	<i>Lysiloma Bahamensis</i> .....	64
<i>Larix microcarpa</i> .....	215	<i>Lysiloma latifolia</i> .....	64
Larix occidentalis.....	216	<b>MA.</b>	
<i>Larix pendula</i> .....	215	Maclura aurantiaca.....	128
<i>Larix tenuifolia</i> .....	215	Madeira.....	94
LAURACEÆ.....	118-120	Madroña.....	97
Laurel.....	98	Magnolia acuminata.....	20
Laurel, Flg.....	19	<i>Magnolia auricularis</i> .....	22
Laurel, California.....	120	<i>Magnolia auriculata</i> .....	22
Laurel, Great.....	99	Magnolia cordata.....	20
Laurel, Mountain.....	120	<i>Magnolia De Candollei</i> .....	20
Laurel Oak ( <i>Quercus imbricaria</i> ).....	154	<i>Magnolia fragrans</i> .....	20
Laurel Oak ( <i>Quercus laurifolia</i> ).....	153	Magnolia Fraseri.....	22
Laurel, Swamp.....	20	Magnolia glauca.....	19
Laurel, White.....	20	<i>Magnolia glauca</i> , var. <i>latifolia</i> .....	20
<i>Laurocerasus Caroliniana</i> .....	69	<i>Magnolia glauca</i> , var. <i>longifolia</i> .....	20
<i>Laurocerasus ilicifolia</i> .....	70	Magnolia grandiflora.....	19
<i>Laurus Borbonica</i> .....	118	<i>Magnolia grandiflora</i> , var. <i>elliptica</i> and <i>obovata</i> .....	19
<i>Laurus Caroliniana</i> .....	118	<i>Magnolia grandiflora</i> , var. <i>lanceolata</i> .....	19
<i>Laurus Carolinensis</i> .....	118	<i>Magnolia longifolia</i> .....	20
<i>Laurus Carolinensis</i> , var. <i>glabra</i> .....	118	Magnolia macrophylla.....	21
<i>Laurus Carolinensis</i> , var. <i>obtus</i> .....	118	Magnolia, Mountain.....	20
<i>Laurus Carolinensis</i> , var. <i>pubescens</i> .....	119	<i>Magnolia pyramidata</i> .....	22
<i>Laurus Catesbei</i> .....	119	<i>Magnolia tripetala</i> .....	21
<i>Laurus Catesbyana</i> .....	119	Magnolia Umbrella.....	21
<i>Laurus regia</i> .....	120	<i>Magnolia Virginiana</i> , var. <i>a. glauca</i> .....	20
<i>Laurus sanguinea</i> .....	119	<i>Magnolia Virginiana</i> , var. <i>β. foetida</i> .....	19
<i>Laurus Sassafras</i> .....	119	<i>Magnolia Virginiana</i> , var. <i>c</i> .....	20
Lawson's Cypress.....	179	<i>Magnolia Virginiana</i> , var. <i>tripetala</i> .....	21
Leaf, Sweet.....	105	MAGNOLIACEÆ.....	19-22
LEGUMINOSÆ.....	55-64	Mahogany.....	84
<i>Leptocarpa Caroliniana</i> .....	60	Mahogany Birch.....	162
<i>Leucaena glauca</i> .....	62	Mahogany, Mountain ( <i>Cerocarpus ledifolius</i> ).....	71
<i>Leucaena pulverulenta</i> .....	63	Mahogany, Mountain ( <i>Cerocarpus parvifolius</i> ).....	71
Leverwood.....	158	MALPIGHACEÆ.....	28
<i>Libocedrus decurrens</i> .....	176	<i>Malpighia lucida</i> .....	28
Lignum-vita.....	28	<i>Malus angustifolia</i> .....	72
LILIACEÆ.....	213, 210	<i>Malus coronaria</i> .....	72
Lime, Ogechee.....	91	<i>Malus diversifolia</i> .....	73
Lime Tree.....	27	<i>Malus microcarpa coronaria</i> .....	72
Lime, Wild ( <i>Xanthoxylum Pterota</i> ).....	31	<i>Malus rivularis</i> .....	73
Lime, Wild ( <i>Ximonia Americana</i> ).....	34	<i>Malus sempervirens</i> .....	72
Lin.....	27	<i>Malus subcordata</i> .....	73
Linden, American.....	27	Manchineel.....	121
<i>Liquidambar macrophylla</i> .....	86	Manchineel, Mountain.....	54
<i>Liquidambar styraciflua</i> .....	86	<i>Mancinella venenata</i> .....	121
<i>Liquidambar styraciflua</i> , var. <i>Mexicana</i> .....	86	Mangrove.....	87
Liquidamber.....	86	Mangrove, Black.....	117
<i>Liriodendron procera</i> .....	22	Mangrove, White.....	87
<i>Liriodendron Tulipifera</i> .....	22	Maple, Ash-leaved.....	51
Live Oak ( <i>Quercus chrysolepis</i> ).....	146	Maple, Black Sugar.....	49
Live Oak ( <i>Quercus virens</i> ).....	145	Maple, Broad-leaved.....	47
Live Oak ( <i>Quercus Wislizeni</i> ).....	147	Maple, Dwarf.....	48
Live Oak, Coast.....	147	Maple, Goose-foot.....	46
Loblolly Bay.....	25	Maple, Hard.....	48
		Maple, Mountain.....	46

	Page.		Page.
Maple, Red .....	50	<i>Mespilus Watsoniana</i> .....	76
Maple, Rock .....	48	? <i>Mespilus Wendlandii</i> .....	77
Maple, Silver .....	49	Mesquit .....	62
Maple, Soft ( <i>Acer dasycarpum</i> ) .....	49	Mesquit, Screw-pod .....	62
Maple, Soft ( <i>Acer rubrum</i> ) .....	50	<i>Melopium Linnei</i> .....	54
Maple, Striped .....	46	Mexican Banana .....	210
Maple, Sugar .....	48	Mexican Mulberry .....	128
Maple, Swamp .....	50	Mexican Persimmon .....	105
Maple, Vine .....	47	<i>Michauxia sessilis</i> .....	25
Maple, Water .....	50	<i>Mimosa biceps</i> .....	62
Maple, White .....	40	<i>Mimosa frondosa</i> .....	62
Marlberry .....	100	<i>Mimosa glauca</i> .....	62
Mastic .....	101	<i>Mimosa Guadalupeensis</i> .....	64
Maul Oak .....	146	<i>Mimosa latistilqua</i> .....	64
May Cherry .....	84	<i>Mimosa leucocephala</i> .....	62
May Haw .....	82	<i>Mimosa rosea</i> .....	64
Meadow Pine .....	202	<i>Mimosa Unguis-cati</i> .....	64
MELIACEÆ .....	33, 34	<i>Mimusops dissecta</i> .....	103
<i>Melicocca paniculata</i> .....	45	<i>Mimusops Sieberl</i> .....	103
<i>Melilobus heterophylla</i> .....	59	Mocker Nut .....	134
<i>Mespilus acerifolia</i> .....	80	Mook Orange .....	70
<i>Mespilus æstivalis</i> .....	82	Monterey Cypress .....	170
<i>Mespilus apifolia</i> .....	81	Monterey Pine .....	196
<i>Mespilus arborea</i> .....	84	Moose Elm .....	123
<i>Mespilus arbutifolia</i> .....	83	Moosewood .....	46
<i>Mespilus Azarolus</i> .....	81	<i>Morus Canadensis</i> (Lamarek and Rafinesque) .....	127
<i>Mespilus berberifolia</i> .....	82	<i>Morus microphylla</i> .....	128
<i>Mespilus Bosciiana</i> .....	77	<i>Morus Missouriensis</i> .....	127
<i>Mespilus Calpodendron</i> .....	79	<i>Morus parvifolia</i> ( <i>Morus microphylla</i> ) .....	128
<i>Mespilus Canadensis</i> .....	84	<i>Morus parvifolia</i> ( <i>Morus rubra</i> ) .....	127
<i>Mespilus Canadensis</i> , var. <i>cordata</i> .....	84	<i>Morus reticulata</i> .....	127
<i>Mespilus Canadensis</i> , var. <i>obovatis</i> .....	85	<i>Morus riparia</i> .....	127
<i>Mespilus Caroliniana</i> .....	82	<i>Morus rubra</i> .....	127
<i>Mespilus coccinea</i> .....	77	<i>Morus rubra</i> , var. <i>Canadensis</i> .....	127
<i>Mespilus cordata</i> .....	80	<i>Morus rubra</i> , var. <i>incisa</i> .....	127
<i>Mespilus cornifolia</i> .....	80	<i>Morus rubra</i> , var. <i>tomentosa</i> .....	127
<i>Mespilus Crus-galli</i> .....	76	<i>Morus scabra</i> .....	127
<i>Mespilus Crus-galli</i> , var. <i>pyracanthifolia</i> .....	76	<i>Morus tomentosa</i> .....	127
<i>Mespilus Crus-galli</i> , var. <i>salicifolia</i> .....	76	Mossy-cup Oak .....	146
<i>Mespilus cuneifolia</i> ( <i>Cratægus Crus-galli</i> ) .....	76	Mountain Ash ( <i>Pyrus Americana</i> ) .....	78
<i>Mespilus cuneifolia</i> ( <i>Cratægus tomentosa</i> , var. <i>punctata</i> ) .....	80	Mountain Ash ( <i>Pyrus sambucifolia</i> ) .....	79
? <i>Mespilus cuneiformis</i> .....	76	Mountain Laurel .....	120
<i>Mespilus elliptica</i> ( <i>Cratægus Crus galli</i> ) .....	76	Mountain Magnolia .....	20
<i>Mespilus elliptica</i> ( <i>Cratægus flava</i> , var. <i>pubescens</i> ) .....	83	Mountain Mahogany ( <i>Cercocarpus ledifolius</i> ) .....	71
<i>Mespilus flabellata</i> .....	77	Mountain Mahogany ( <i>Cercocarpus parvifolius</i> ) .....	71
<i>Mespilus flava</i> .....	82	Mountain Manchinel .....	54
<i>Mespilus flexispina</i> .....	82	Mountain Maple .....	46
<i>Mespilus glandulosa</i> .....	77	Mountain Plum .....	84
<i>Mespilus hiemalis</i> .....	83	Mountain White Oak .....	143
<i>Mespilus latifolia</i> .....	79	Mulberry, Mexican .....	128
<i>Mespilus linearis</i> .....	77	Mulberry, Red .....	128
<i>Mespilus lobata</i> .....	79	<i>Myginda pallens</i> .....	38
<i>Mespilus lucida</i> .....	76	<i>Mylocaryum ligustrinum</i> .....	88
<i>Mespilus lucida</i> , var. <i>angustifolia</i> .....	77	<i>Myrica Californica</i> .....	137
<i>Mespilus Michauxii</i> .....	83	<i>Myrica Carolinensis</i> .....	136
<i>Mespilus monogyna</i> , var. <i>apifolia</i> .....	81	<i>Myrica cerifera</i> .....	136
<i>Mespilus nivea</i> .....	84	<i>Myrica cerifera humilis</i> .....	136
<i>Mespilus odorata</i> .....	79	<i>Myrica cerifera sempervirens</i> .....	136
<i>Mespilus ovalifolia</i> .....	76	<i>Myrica cerifera</i> , var. <i>angustifolia</i> .....	136
<i>Mespilus Phenopyrum</i> .....	80	<i>Myrica cerifera</i> , var. <i>arborescens</i> .....	136
<i>Mespilus populifolia</i> .....	78	<i>Myrica cerifera</i> , var. <i>latifolia</i> .....	136
<i>Mespilus pruinosa</i> .....	79	<i>Myrica cerifera</i> , var. <i>media</i> .....	136
<i>Mespilus prunellifolia</i> .....	76	<i>Myrica cerifera</i> , var. <i>pumila</i> .....	136
<i>Mespilus prunifolia</i> ? .....	77	<i>Myrica Pennsylvanica</i> .....	136
<i>Mespilus pubescens</i> .....	80	? <i>Myrica Xalapensis</i> .....	137
<i>Mespilus punctata</i> .....	77	MYRICACÆ .....	136, 137
<i>Mespilus pyrifolia</i> ( <i>Cratægus tomentosa</i> ) .....	79	MYRSINACÆ .....	90, 100
<i>Mespilus pyrifolia</i> ( <i>Cratægus tomentosa</i> , var. <i>punctata</i> ) .....	80	<i>Myrsine floribunda</i> .....	90
<i>Mespilus rotundifolia</i> ( <i>Cratægus coccinea</i> ) .....	77	<i>Myrsine Florida</i> .....	90
<i>Mespilus rotundifolia</i> ( <i>Cratægus Crus-galli</i> , var. <i>prunifolia</i> ) .....	77	<i>Myrsine Rapanca</i> .....	90
<i>Mespilus salicifolia</i> .....	76	MYRTACÆ .....	88, 89
<i>Mespilus spathulata</i> .....	81	Myrtle, Blue .....	41
<i>Mespilus tiliaefolia</i> .....	78	Myrtle, Wax .....	136
<i>Mespilus turbinata</i> .....	82	<i>Myrtus axillaris</i> .....	88
<i>Mespilus viridis</i> .....	78	<i>Myrtus buxifolia</i> .....	88

	Page.		Page.
<i>Myrtus Chytraculia</i> .....	88	Oak, Chestnut ( <i>Quercus Prinus</i> ) .....	142
? <i>Myrtus dichotoma</i> .....	88	Oak, Chinquapin .....	143
<i>Myrtus monticola</i> .....	89	Oak, Coast Live .....	147
<i>Myrtus Poirati</i> .....	88	Oak, Cow .....	141
<i>Myrtus procera</i> .....	89	Oak, Duck .....	152
<b>N.</b>			
Naked Wood ( <i>Colubrina reclinata</i> ) .....	42	Oak, Iron .....	139
Naked Wood ( <i>Eugenia dichotoma</i> ) .....	88	Oak, Jack .....	150
Nannyberry .....	94	Oak, Laurel ( <i>Quercus imbricaria</i> ) .....	154
Necklace Poplar .....	175	Oak, Laurel ( <i>Quercus laurifolia</i> ) .....	153
<i>Nectandra Brademeteriana</i> .....	110	Oak, Live ( <i>Quercus chrysolepis</i> ) .....	140
<i>Nectandra Willdenoviana</i> .....	110	Oak, Live ( <i>Quercus virens</i> ) .....	145
<i>Negundium fraxinifolium</i> .....	51	Oak, Live ( <i>Quercus Wislizeni</i> ) .....	147
<i>Negundo aceroides</i> .....	50	Oak, Maul .....	140
<i>Negundo aceroides</i> ( <i>Negundo Californicum</i> ) .....	51	Oak, Mossy-cup .....	140
<i>Negundo Californicum</i> .....	51	Oak, Mountain White .....	143
<i>Negundo Californicum</i> ( <i>Negundo aceroides</i> ) .....	51	Oak, Over-cup ( <i>Quercus lyrata</i> ) .....	140
<i>Negundo fraxinifolium</i> .....	51	Oak, Over-cup ( <i>Quercus macrocarpa</i> ) .....	140
<i>Negundo lobatum</i> .....	51	Oak, Peach ( <i>Quercus densiflora</i> ) .....	155
? <i>Negundo Mexicanum</i> .....	51	Oak, Peach ( <i>Quercus Phellos</i> ) .....	154
<i>Negundo trifoliatum</i> .....	51	Oak, Pin .....	153
Newcastle Thorn .....	76	Oak, Possum .....	152
Norway Pine .....	192	Oak, Post .....	159
Nut, Bitter .....	135	Oak, Punk .....	151
Nut, Bull .....	134	Oak, Quercitron .....	149
Nut, Coffee .....	58	Oak, Red ( <i>Quercus fulcata</i> ) .....	151
Nut, Illinois .....	182	Oak, Red ( <i>Quercus rubra</i> ) .....	148
Nut, King .....	134	Oak, Red ( <i>Quercus rubra, var. Texana</i> ) .....	143
Nut, Mocker .....	134	Oak, Rock Chestnut .....	142
Nut, Pig .....	134	Oak, Scarlet .....	148
Nut Pine ( <i>Pinus cembroides</i> ) .....	190	Oak, Scrub ( <i>Quercus Catesbaei</i> ) .....	151
Nut Pine ( <i>Pinus edulis</i> ) .....	190	Oak, Scrub ( <i>Quercus undulata, var. Gambelii</i> ) .....	139
Nut Pine ( <i>Pinus monophylla</i> ) .....	190	Oak, Shingle .....	151
Nut Pine ( <i>Pinus Parryana</i> ) .....	189	Oak, Spanish .....	151
Nut, Tallow .....	34	Oak, Swamp Post .....	140
Nutmeg, California .....	180	Oak, Swamp Spanish .....	152
Nutmeg, Hickory .....	135	Oak, Swamp White .....	141
NYCTAGINACEÆ .....	117	Oak, Tanbark .....	155
<i>Nyssa aquatica</i> ( <i>Nyssa sylvatica</i> ) .....	92	Oak, Turkey .....	151
<i>Nyssa aquatica</i> ( <i>Nyssa uniflora</i> ) .....	92	Oak, Upland Willow .....	153
<i>Nyssa angulicarpa</i> .....	93	Oak, Valparaiso .....	140
<i>Nyssa angulosa</i> .....	93	Oak, Water ( <i>Quercus aquatica</i> ) .....	152
<i>Nyssa biflora</i> .....	92	Oak, Water ( <i>Quercus palustris</i> ) .....	152
<i>Nyssa Canadensis</i> .....	92	Oak, Water White .....	140
<i>Nyssa candicans</i> .....	91	Oak, Weeping .....	138
<i>Nyssa capitata</i> .....	91	Oak, White ( <i>Quercus alba</i> ) .....	137
<i>Nyssa capitata, var. grandidentata</i> .....	93	Oak, White ( <i>Quercus Garryana</i> ) .....	138
<i>Nyssa Caroliniana</i> .....	92	Oak, White ( <i>Quercus grisea</i> ) .....	144
<i>Nyssa coccinea</i> .....	91	Oak, White ( <i>Quercus lobata</i> ) .....	138
<i>Nyssa denticulata</i> .....	92	Oak, White ( <i>Quercus oblongifolia</i> ) .....	144
<i>Nyssa grandidentata</i> .....	93	Oak, Willow .....	154
<i>Nyssa integrifolia</i> .....	92	Oak, Yellow ( <i>Quercus prinoides</i> ) .....	143
<i>Nyssa montana</i> .....	91	Oak, Yellow ( <i>Quercus tinctoria</i> ) .....	149
<i>Nyssa multiflora</i> .....	92	Oak, Yellow-bark .....	149
<i>Nyssa multiflora, var. sylvatica</i> .....	93	Obispo Pine .....	200
<i>Nyssa Ogeche</i> .....	91	<i>Ænocarpus regia</i> .....	218
<i>Nyssa palustris</i> .....	93	Ogechee Lime .....	91
<i>Nyssa sylvatica</i> .....	92	Ohio Buckeye .....	42
<i>Nyssa tomentosa</i> ( <i>Nyssa capitata</i> ) .....	91	OLACINÆÆ .....	34
<i>Nyssa tomentosa</i> ( <i>Nyssa uniflora</i> ) .....	93	Old-field Birch .....	159
<i>Nyssa uniflora</i> .....	92	Old-field Pine .....	197
<i>Nyssa villosa</i> .....	92	Old Man's Beard .....	113
<b>O.</b>			
Oak, Bartram's .....	153	<i>Olea Americana</i> .....	113
Oak, Basket .....	141	OLEACEÆ .....	106-113
Oak, Black ( <i>Quercus Emoryi</i> ) .....	146	Olive, California .....	120
Oak, Black ( <i>Quercus Kelloggii</i> ) .....	140	Olneya Tesota .....	58
Oak, Black ( <i>Quercus rubra</i> ) .....	143	Orange, Mock .....	70
Oak, Black ( <i>Quercus tinctoria</i> ) .....	140	Orange, Osage .....	128
Oak, Blue .....	143	Orange, Wild ( <i>Prunus Caroliniana</i> ) .....	70
Oak, Burr .....	140	Orange, Wild ( <i>Xanthoxylum Clava-Herculis</i> ) .....	30
Oak, Chestnut ( <i>Quercus densiflora</i> ) .....	155	<i>Orchidocarpum arcticum</i> .....	23
Oak, Chestnut ( <i>Quercus prinoides</i> ) .....	143	Oregon Ash .....	111
		Oregon Cedar .....	170
		Oregon Crab Apple .....	73
		Oregon Pine .....	209
		<i>Oreodaphne Californica</i> .....	120

	Page.		Page.
<i>Oreodoxa oleracea?</i> .....	218	<i>Photinia arbutifolia</i> .....	88
<i>Oreodoxa regia</i> .....	218	<i>Photinia salicifolia</i> .....	88
Osage Orange .....	128	<i>Picea alba</i> .....	204
<i>Osmanthus Americanus</i> .....	113	<i>Picea amabilis</i> ( <i>Abies amabilis</i> ) .....	213
<i>Ostrya Virginiana</i> .....	158	<i>Picea amabilis</i> ( <i>Abies subalpina</i> ) .....	211
<i>Ostrya Virginica</i> .....	158	<i>Picea balsamea</i> .....	211
<i>Ostrya Virginica</i> , var. <i>eglandulosa</i> .....	158	<i>Picea balsamea</i> , var. <i>longifolia</i> .....	211
<i>Ostrya Virginica</i> , var. <i>glandulosa</i> .....	158	<i>Picea bifolia</i> .....	211
Over-cup Oak ( <i>Quercus lyrata</i> ) .....	140	<i>Picea bracteata</i> .....	213
Over-cup Oak ( <i>Quercus macrocarpa</i> ) .....	140	? <i>Picea Californica</i> .....	208
<i>Oxydendrum arboreum</i> .....	98	<i>Picea Canadensis</i> .....	206
<b>P.</b>			
<i>Padus cartilaginea</i> .....	68	<i>Picea ocerulea</i> .....	204
<i>Padus demissa</i> .....	60	<i>Picea concolor</i> .....	212
<i>Padus serotina</i> .....	68	<i>Picea concolor</i> , var. <i>violacea</i> .....	212
<i>Padus Virginiana</i> .....	68	<i>Picea Douglasii</i> .....	200
Palm, Fan-leaf .....	217	<i>Picea Engelmanni</i> .....	205
Palm, Royal .....	218	<i>Picea Fraseri</i> ( <i>Abies balsamea</i> ) .....	211
<i>Palma argentea</i> .....	218	<i>Picea Fraseri</i> ( <i>Abies Fraseri</i> ) .....	210
PALMACHÆ .....	217, 218	<i>Picea glauca</i> .....	204
Palmetto, Cabbage .....	217	<i>Picea grandis</i> ( <i>Abies concolor</i> ) .....	213
Palmetto, Silk-top .....	217	<i>Picea grandis</i> ( <i>Abies grandis</i> ) .....	212
Palmetto, Silver-top .....	218	<i>Picea laza</i> .....	204
Palo Blanco .....	120	<i>Picea Lowiana</i> .....	212
Palo Verde .....	60	<i>Picea magnifica</i> .....	214
Papaw .....	23	<i>Picea Menziesii</i> ( <i>Picea pungens</i> ) .....	205
Paper Birch .....	160	<i>Picea Menziesii</i> ( <i>Picea Sitkensis</i> ) .....	200
Paradise Tree .....	82	<i>Picea nigra</i> .....	202
<i>Parkinsonia aculeata</i> .....	60	<i>Picea nigra</i> , var. <i>glauca</i> .....	204
<i>Parkinsonia microphylla</i> .....	60	<i>Picea nigra</i> , var. <i>rubra</i> .....	203
<i>Parkinsonia Torreyana</i> .....	60	<i>Picea nobilis</i> .....	214
Parsley Haw .....	81	<i>Picea pungens</i> .....	205
<i>Pasania densiflora</i> .....	155	<i>Picea rubra</i> .....	203
<i>Pavia Californica</i> .....	43	<i>Picea Sitkensis</i> .....	208
? <i>Pavia carnea</i> .....	42	<i>Pickeringia paniculata</i> .....	100
<i>Pavia discolor</i> .....	43	Pigeon Cherry .....	66
<i>Pavia flava</i> .....	43	Pigeon Plum .....	117
<i>Pavia glabra</i> .....	42	Pigeonwood .....	117
<i>Pavia hybrida</i> .....	43	Pig Nut .....	134
<i>Pavia lutea</i> .....	43	<i>Pilocereus Engelmanni</i> .....	80
<i>Pavia neglecta</i> .....	43	Pin Cherry .....	66
<i>Pavia pallida</i> .....	42	Pin Oak .....	152
? <i>Pavia Watsoniana</i> .....	42	<i>Pinckneya pubens</i> .....	95
Peach Oak ( <i>Quercus densiflora</i> ) .....	155	<i>Pinckneya pubescens</i> .....	95
Peach Oak ( <i>Quercus Phellos</i> ) .....	154	Pine, Bastard .....	202
Peach, Wild .....	70	Pine, Bishop's .....	200
Pear Haw .....	70	Pine, Black ( <i>Pinus Jeffreyi</i> ) .....	103
Pecan .....	132	Pine, Black ( <i>Pinus Murrayana</i> ) .....	105
Pecan, Bitter .....	130	Pine, Bull ( <i>Pinus Jeffreyi</i> ) .....	103
Pepperidge .....	92	Pine, Bull ( <i>Pinus mitis</i> ) .....	200
Pepperwood .....	80	Pine, Bull ( <i>Pinus ponderosa</i> ) .....	193
<i>Persea Borbonica</i> .....	118	Pine, Bull ( <i>Pinus Sabiniana</i> ) .....	195
<i>Persea Carolinensis</i> .....	118	Pine, Cedar .....	201
<i>Persea Carolinensis</i> , var. <i>glabriuscula</i> .....	118	Pine, Digger .....	195
<i>Persea Carolinensis</i> , var. <i>palustris</i> .....	119	Pine, Foxtail .....	101
<i>Persea Carolinensis</i> , var. <i>pubescens</i> .....	119	Pine, Georgia .....	202
<i>Persea Catesbyana</i> .....	119	Pine, Ginger .....	179
<i>Persea Sassafras</i> .....	110	Pine, Gray .....	201
Persimmon .....	104	Pine, Hard .....	202
Persimmon, Black .....	105	Pine, Hickory ( <i>Pinus Balfouriana</i> , var. <i>aristata</i> ) .....	101
Persimmon, Mexican .....	105	Pine, Hickory ( <i>Pinus pungens</i> ) .....	100
<i>Phenopyrum acerifolium</i> .....	80	Pine, Jersey .....	100
<i>Phenopyrum arborescens</i> .....	75	Pine, Knob-cone .....	106
<i>Phenopyrum Carolinianum</i> .....	82	Pine, Loblolly .....	107
<i>Phenopyrum coccineum</i> .....	77	Pine, Lodge-pole .....	195
<i>Phenopyrum cordatum</i> .....	80	Pine, Long-leaved .....	202
<i>Phenopyrum ellipticum</i> .....	82	Pine, Meadow .....	202
<i>Phenopyrum populifolium</i> .....	78	Pine, Monterey .....	196
<i>Phenopyrum pruiniosum</i> .....	79	Pine, Norway .....	192
<i>Phenopyrum spathulatum</i> .....	81	Pine, Nut ( <i>Pinus cembroides</i> ) .....	190
<i>Phenopyrum subvillosum</i> .....	78	Pine, Nut ( <i>Pinus edulis</i> ) .....	100
<i>Phenopyrum Virginicum</i> .....	82	Pine, Nut ( <i>Pinus monophylla</i> ) .....	190
? <i>Phenopyrum viride</i> .....	78	Pine, Nut ( <i>Pinus Parryana</i> ) .....	180
<i>Phenopyrum Wendlandii</i> .....	77	Pine, Obispo .....	200
		Pine, Old-field .....	197
		Pine, Oregon .....	200

	Page.		Page.
Pine, Pitch .....	198	<i>Pinus contorta</i> ( <i>Pinus Murrayana</i> ) .....	194
Pine, Pond .....	198	<i>Pinus contorta</i> , var. <i>Bolanderi</i> .....	194
Pine, Prince's .....	201	<i>Pinus contorta</i> , var. <i>latifolia</i> .....	194
Pine, Red .....	162	<i>Pinus Coulteri</i> .....	195
Pine, Rosemary .....	107	<i>Pinus Craigiana</i> .....	198
Pine, Sand .....	199	<i>Pinus Cubensis</i> .....	202
Pine, Scrub ( <i>Pinus Banksiana</i> ) .....	201	<i>Pinus Cubensis</i> , var. <i>terthrocarpa</i> .....	202
Pine, Scrub ( <i>Pinus clausa</i> ) .....	199	<i>Pinus deflexa</i> .....	193
Pine, Scrub ( <i>Pinus contorta</i> ) .....	194	<i>Pinus Douglasii</i> .....	200
Pine, Scrub ( <i>Pinus inops</i> ) .....	199	<i>Pinus Douglasii</i> , var. <i>brevibracteata</i> .....	200
Pine, Short-leaved .....	200	<i>Pinus eckinata</i> .....	200
Pine, Slash .....	202	<i>Pinus Edgariana</i> .....	160
Pine, Southern .....	202	<i>Pinus edulis</i> .....	180
Pine, Spruce ( <i>Pinus clausa</i> ) .....	199	<i>Pinus Elliottii</i> .....	202
Pine, Spruce ( <i>Pinus glabra</i> ) .....	201	<i>Pinus Engelmannii</i> ( <i>Picea Engelmannii</i> ) .....	205
Pine, Spruce ( <i>Pinus mitis</i> ) .....	200	<i>Pinus Engelmannii</i> ( <i>Pinus ponderosa</i> ) .....	198
Pine, Spruce ( <i>Pinus Murrayana</i> ) .....	105	<i>Pinus flexilis</i> .....	168
Pine, Sugar .....	188	<i>Pinus flexilis</i> ( <i>Pinus albicaulis</i> ) .....	189
Pine, Swamp .....	202	<i>Pinus flexilis</i> , var. <i>albicaulis</i> .....	189
Pine, Table-mountain .....	199	<i>Pinus flexilis</i> , var. <i>macrocarpa</i> .....	188
Pine, Weymouth .....	187	<i>Pinus flexilis</i> , var. <i>reflexa</i> .....	189
Pine, White ( <i>Pinus flexilis</i> ) .....	188	<i>Pinus flexilis</i> , var. <i>serrulata</i> .....	188
Pine, White ( <i>Pinus glabra</i> ) .....	201	<i>Pinus Fraseri</i> ( <i>Abies Fraseri</i> ) .....	210
Pine, White ( <i>Pinus monticola</i> ) .....	187	<i>Pinus Fraseri</i> ( <i>Pinus rigida</i> ) .....	197
Pine, White ( <i>Pinus reflexa</i> ) .....	189	<i>Pinus Fremontiana</i> .....	190
Pine, White ( <i>Pinus Strobus</i> ) .....	187	<i>Pinus futilis</i> .....	190
Pine, Yellow ( <i>Pinus Arizona</i> ) .....	192	<i>Pinus glabra</i> .....	200
Pine, Yellow ( <i>Pinus mitis</i> ) .....	200	<i>Pinus grandis</i> ( <i>Abies amabilis</i> ) .....	213
Pine, Yellow ( <i>Pinus palustris</i> ) .....	202	<i>Pinus grandis</i> ( <i>Abies concolor</i> ) .....	212
Pine, Yellow ( <i>Pinus ponderosa</i> ) .....	193	<i>Pinus grandis</i> ( <i>Abies grandis</i> ) .....	212
Piñon ( <i>Pinus edulis</i> ) .....	190	<i>Pinus Grozietieri</i> .....	187
Piñon ( <i>Pinus monophylla</i> ) .....	100	<i>Pinus Hudsonica</i> .....	201
Piñon ( <i>Pinus Parryana</i> ) .....	189	<i>Pinus inops</i> .....	198
<i>Pinus Abies Americana</i> .....	206	<i>Pinus inops</i> ( <i>Pinus contorta</i> ) .....	194
<i>Pinus Abies Balsamea</i> .....	211	<i>Pinus inops</i> ( <i>Pinus Murrayana</i> ) .....	194
<i>Pinus Abies Canadensis</i> .....	202	<i>Pinus inops</i> , var. ( <i>Pinus muricata</i> ) .....	100
<i>Pinus adunca</i> .....	196	<i>Pinus inops</i> , var. <i>clausa</i> .....	199
<i>Pinus alba</i> .....	204	<i>Pinus insignis</i> .....	196
<i>Pinus albicaulis</i> .....	180	<i>Pinus insignis macrocarpa</i> .....	196
<i>Pinus amabilis</i> ( <i>Abies amabilis</i> ) .....	213	<i>Pinus insignis</i> , var. <i>binata</i> .....	196
<i>Pinus amabilis</i> ( <i>Abies magnifica</i> ) .....	214	<i>Pinus intermedia</i> .....	215
<i>Pinus amabilis</i> ( <i>Abies subalpina</i> ) .....	211	<i>Pinus Jeffreyi</i> .....	193
<i>Pinus Americana</i> ( <i>Picea nigra</i> ) .....	208	<i>Pinus Lambertiana</i> .....	188
<i>Pinus Americana</i> ( <i>Tsuga Canadensis</i> ) .....	206	<i>Pinus Lambertiana</i> , var. ( <i>Pinus flexilis</i> ) .....	188
<i>Pinus Americana rubra</i> .....	202	<i>Pinus Lambertiana</i> , var. <i>brevifolia</i> .....	188
<i>Pinus aristata</i> .....	191	<i>Pinus laricina</i> .....	215
<i>Pinus Arizona</i> .....	192	<i>Pinus Lariois</i> , var. <i>resinosa</i> .....	191
<i>Pinus australis</i> .....	201	<i>Pinus Larix</i> .....	216
<i>Pinus Balfouriana</i> .....	191	<i>Pinus Larix alba</i> .....	215
<i>Pinus Balfouriana</i> ( <i>Pinus Balfouriana</i> , var. <i>aristata</i> ) .....	191	<i>Pinus Larix nigra</i> .....	215
<i>Pinus Balfouriana</i> , var. <i>aristata</i> .....	191	<i>Pinus Larix rubra</i> .....	215
<i>Pinus balsamea</i> .....	210	<i>Pinus lasiocarpa</i> ( <i>Abies concolor</i> ) .....	212
<i>Pinus balsamea</i> , var. <i>Fraseri</i> .....	210	? <i>Pinus lasiocarpa</i> ( <i>Abies subalpina</i> ) .....	211
<i>Pinus Banksiana</i> .....	201	<i>Pinus Llaveana</i> ( <i>Pinus cembroides</i> ) .....	190
<i>Pinus Banksiana</i> ( <i>Pinus contorta</i> ) .....	194	<i>Pinus Llaveana</i> ( <i>Pinus Parryana</i> ) .....	189
<i>Pinus Beardleyi</i> .....	198	<i>Pinus Loddigesii</i> .....	197
<i>Pinus Benthamiana</i> .....	193	<i>Pinus lophosperma</i> .....	192
<i>Pinus Bolanderi</i> .....	194	<i>Pinus Loviana</i> .....	212
<i>Pinus Boursieri</i> .....	194	<i>Pinus Lyallii</i> .....	216
<i>Pinus brachyptera</i> .....	193	<i>Pinus Mariana</i> .....	202
<i>Pinus dracteata</i> .....	218	<i>Pinus macrocarpa</i> .....	195
? <i>Pinus Californica</i> ( <i>Pinus insignis</i> ) .....	196	<i>Pinus macrophylla</i> ? .....	193
<i>Pinus Californica</i> ( <i>Pinus tuberculata</i> ) .....	196	<i>Pinus Menziesii</i> .....	206
<i>Pinus Canadensis</i> ( <i>Picea alba</i> ) .....	204	<i>Pinus Menziesii</i> , var. <i>crispa</i> .....	206
<i>Pinus Canadensis</i> ( <i>Tsuga Canadensis</i> ) .....	206	<i>Pinus Mertensiana</i> .....	207
<i>Pinus Canadensis</i> ( <i>Tsuga Mertensiana</i> ) .....	207	<i>Pinus microcarpa</i> .....	215
<i>Pinus cembroides</i> .....	190	<i>Pinus mitis</i> .....	200
<i>Pinus cembroides</i> ( <i>Pinus albicaulis</i> ) .....	189	<i>Pinus mitis</i> , var. <i>paupera</i> .....	200
<i>Pinus cembroides</i> ( <i>Pinus edulis</i> ) .....	190	<i>Pinus monophylla</i> .....	190
<i>Pinus Chihuahuana</i> .....	194	<i>Pinus monticola</i> .....	187
<i>Pinus clausa</i> .....	199	<i>Pinus muricata</i> .....	199
<i>Pinus commutata</i> .....	205	<i>Pinus muricata</i> ( <i>Pinus contorta</i> ) .....	194
<i>Pinus concolor</i> .....	212	<i>Pinus Murrayana</i> .....	194
<i>Pinus contorta</i> .....	194	<i>Pinus nigra</i> .....	202
<i>Pinus contorta</i> ( <i>Pinus muricata</i> ) .....	199	<i>Pinus nobilis</i> .....	214

	Page.		Page.
<i>Pinus Nuttallii</i> .....	216	<i>Platanus lobata</i> .....	120
<i>Pinus oostoeperma</i> .....	190	<i>Platanus Mexicana</i> ( <i>Platanus racemosa</i> ) .....	120
<i>Pinus palustris</i> .....	201	<i>Platanus Mexicana</i> ( <i>Platanus Wrightii</i> ) .....	130
<i>Pinus Parryana</i> .....	189	<i>Platanus occidentalis</i> .....	120
<i>Pinus Parryana</i> ( <i>Pinus ponderosa</i> ) .....	193	<i>Platanus occidentalis</i> ( <i>Platanus racemosa</i> ) .....	120
<i>Pinus Pattoniana</i> ( <i>Tsuga Mertensiana</i> ) .....	208	<i>Platanus racemosa</i> .....	120
<i>Pinus Pattoniana</i> ( <i>Tsuga Pattoniana</i> ) .....	208	<i>Platanus racemosa</i> ( <i>Platanus Wrightii</i> ) .....	130
<i>Pinus pendula</i> .....	215	<i>Platanus vulgaris</i> , var. <i>angulosa</i> .....	120
<i>Pinus ponderosa</i> .....	102	<i>Platanus Wrightii</i> .....	130
<i>Pinus ponderosa</i> , var. <i>Benthiana</i> .....	103	Plum, Canada .....	65
<i>Pinus ponderosa</i> , var. <i>Jeffreyi</i> .....	103	Plum, Chickasaw .....	66
<i>Pinus ponderosa</i> , var. <i>scopulorum</i> .....	103	Plum, Cocoa .....	65
<i>Pinus porphyrocarpa</i> .....	187	Plum, Darling .....	30
<i>Pinus pungens</i> .....	109	Plum, Downward .....	103
<i>Pinus radiata</i> .....	190	Plum, Gopher .....	61
<i>Pinus reflexa</i> .....	180	Plum, Guiana .....	121
<i>Pinus resinosa</i> .....	101	Plum, Hog ( <i>Prunus angustifolia</i> ) .....	66
<i>Pinus resinosa</i> ( <i>Pinus ponderosa</i> ) .....	103	Plum, Hog ( <i>Rhus Metopium</i> ) .....	54
<i>Pinus rigida</i> .....	197	Plum, Hog ( <i>Ximenia Americana</i> ) .....	34
<i>Pinus rigida?</i> ( <i>Pinus insignis</i> ) .....	196	Plum, Horse .....	65
<i>Pinus rigida</i> ( <i>Pinus mitis</i> ) .....	200	Plum, Mountain .....	34
<i>Pinus rigida</i> , var. <i>serotina</i> .....	198	Plum, Pigeon .....	117
<i>Pinus rubra</i> ( <i>Picea nigra</i> ) .....	203	Plum, Saffron .....	103
<i>Pinus rubra</i> ( <i>Pinus resinosa</i> ) .....	101	Plum, Wild .....	65
<i>Pinus rubra</i> , var. <i>violacea</i> .....	204	Poison Elder .....	54
<i>Pinus rupestris</i> .....	201	Poison Sumach .....	54
<i>Pinus Sabiniana</i> .....	195	Poisonwood ( <i>Rhus Metopium</i> ) .....	54
<i>Pinus Sabiniana Coulteri</i> .....	195	Poisonwood ( <i>Sebastiania lucida</i> ) .....	121
<i>Pinus Sabiniana macrocarpa</i> .....	195	POLYGONACEÆ .....	117, 118
<i>Pinus serotina</i> .....	198	<i>Polygonum wifera</i> .....	118
<i>Pinus Shasta</i> .....	189	Pond Apple .....	23
<i>Pinus Sinclairii</i> .....	196	Pond Pine .....	198
<i>Pinus Sitchensis</i> .....	206	Poplar .....	172
? <i>Pinus species</i> ( <i>Abies subalpina</i> ) .....	211	Poplar, Carolina .....	175
<i>Pinus Strobus</i> .....	187	Poplar, Necklaco .....	175
<i>Pinus Strobus</i> , var. <i>alba</i> .....	187	Poplar, Yellow .....	22
<i>Pinus Strobus</i> , var. <i>brevifolia</i> .....	187	<i>Populus aladescæ</i> .....	173
<i>Pinus Strobus</i> , var. <i>compressa</i> .....	187	<i>Populus angulata</i> .....	175
<i>Pinus Strobus</i> , var. <i>monticola</i> .....	187	<i>Populus angulosa</i> .....	175
<i>Pinus Strobus</i> , var. <i>nivea</i> .....	187	<i>Populus angustifolia</i> .....	174
<i>Pinus sylvestris</i> , var. <i>divaricata</i> .....	201	<i>Populus angustifolia</i> ( <i>Populus trichocarpa</i> ) .....	174
<i>Pinus Tæda</i> .....	197	<i>Populus argentea</i> .....	172
<i>Pinus Tæda</i> , var. <i>a.</i> .....	197	<i>Populus Atheniensis</i> .....	171
<i>Pinus Tæda</i> , var. <i>alopeuroidea</i> .....	198	<i>Populus balsamifera</i> .....	173
<i>Pinus Tæda</i> , var. <i>heterophylla</i> .....	202	<i>Populus balsamifera</i> ( <i>Populus trichocarpa</i> ) .....	174
<i>Pinus Tæda</i> , var. <i>rigida</i> .....	197	<i>Populus balsamifera lanceolata</i> .....	173
<i>Pinus Tæda</i> , var. <i>tenuifolia</i> .....	197	<i>Populus balsamifera</i> , var. ....	174
<i>Pinus Tæda</i> , var. <i>variabilis</i> .....	200	<i>Populus balsamifera</i> , var. <i>angustifolia</i> .....	174
<i>Pinus Tæda</i> , var. <i>Virginiana</i> .....	198	<i>Populus balsamifera</i> , var. ? <i>Californica</i> .....	174
<i>Pinus taxifolia</i> .....	200	<i>Populus balsamifera</i> , var. <i>candicans</i> .....	173
<i>Pinus tetragona</i> .....	204	<i>Populus balsamifera</i> , var. <i>genuina</i> .....	173
<i>Pinus Torreyana</i> .....	192	<i>Populus Canadensis</i> ( <i>Populus balsamifera</i> , var. <i>candicans</i> ) .....	173
<i>Pinus tuberculata</i> .....	196	<i>Populus Canadensis</i> ( <i>Populus monilifera</i> ) .....	175
<i>Pinus tuberculata</i> ( <i>Pinus insignis</i> ) .....	106	<i>Populus Canadensis</i> , var. <i>angustifolia</i> .....	174
<i>Pinus variabilis</i> .....	200	<i>Populus candicans</i> .....	173
<i>Pinus venusta</i> .....	213	<i>Populus cordifolia</i> .....	172
<i>Pinus Virginiana</i> .....	198	? <i>Populus deltoidea</i> .....	174
<i>Pinus Virginiana</i> , var. <i>echinata</i> .....	200	<i>Populus Fremontii</i> .....	175
<i>Pisidia Carthagenensis</i> .....	57	<i>Populus Fremontii</i> , var. <i>Wislizeni</i> .....	176
<i>Pisidia Erythrina</i> .....	57	<i>Populus glandulosa</i> .....	175
<i>Pisonia aculeata</i> .....	117	<i>Populus grandidentata</i> .....	172
<i>Pisonia obtusata</i> .....	117	<i>Populus grandidentata</i> , var. <i>pendula</i> .....	172
<i>Pistacia Mexicana</i> .....	54	<i>Populus heterophylla</i> .....	172
Pitch Pine .....	198	<i>Populus heterophylla</i> ( <i>Populus balsamifera</i> , var. <i>candicans</i> ) .....	173
<i>Pithecolobium forbesi</i> .....	61	<i>Populus heterophylla</i> , var. <i>argentea</i> .....	172
<i>Pithecolobium Guadalupeense</i> .....	64	<i>Populus laevigata</i> ( <i>Populus monilifera</i> , <i>Aiton</i> , etc.) .....	175
<i>Pithecolobium microphyllum</i> .....	64	<i>Populus laevigata</i> ( <i>Populus monilifera</i> , <i>Hort.</i> ) .....	175
<i>Pithecolobium Unguis-cati</i> .....	64	<i>Populus latifolia</i> .....	173
<i>Planera aquatica</i> .....	124	<i>Populus Lindleyana</i> .....	175
<i>Planera Amelini</i> .....	124	<i>Populus macrophylla</i> ( <i>Populus balsamifera</i> , var. <i>candicans</i> ) .....	173
<i>Planera Richardi</i> .....	124	<i>Populus macrophylla</i> ( <i>Populus monilifera</i> ) .....	175
<i>Planera ulmifolia</i> .....	124	<i>Populus Marylandica</i> .....	175
PLATANACEÆ .....	120, 130	<i>Populus monilifera</i> .....	174
<i>Platanus Californica</i> .....	120	<i>Populus monilifera</i> ( <i>Populus Fremontii</i> ) .....	175
<i>Platanus hybridæ</i> .....	120	<i>Populus monilifera</i> ( <i>Populus Fremontii</i> , var. <i>Wislizeni</i> ) .....	175

	Page.		Page.
<i>Populus neglecta</i> .....	175	<i>Ptelia mollis</i> .....	31
<i>Populus Ontariensis</i> .....	173	<i>Ptelia trifoliata</i> .....	31
<i>Populus Tacamahaca</i> .....	173	<i>Ptelia trifoliata, var. mollis</i> .....	31
<i>Populus tremuliformis</i> .....	171	<i>Ptelia viticifolia</i> .....	31
<i>Populus tremuloides</i> .....	171	Punk Oak .....	152
<i>Populus trepida</i> .....	171	Purple Haw .....	40
<i>Populus trichocarpa</i> .....	174	<i>Pyrus Americana</i> .....	73
<i>Populus trichocarpa, var. cupulata</i> .....	174	<i>Pyrus Americana</i> ( <i>Pyrus sambucifolia</i> ) .....	74
<i>Populus viminea</i> .....	173	<i>Pyrus Americana, var. microcarpa</i> .....	74
<i>Populus Virginiana</i> .....	175	<i>Pyrus angustifolia</i> .....	72
<i>Porcelia triloba</i> .....	23	<i>Pyrus aucuparia</i> ( <i>Pyrus Americana</i> ) .....	73
Porkwood .....	117	<i>Pyrus aucuparia</i> ( <i>Pyrus sambucifolia</i> ) .....	74
Portiera angustifolia .....	29	<i>Pyrus Bartramiana</i> .....	84
Port Orford Cedar .....	179	<i>Pyrus Botryapium</i> .....	84
Possam Oak .....	152	<i>Pyrus coronaria</i> .....	72
Post Cedar .....	176	<i>Pyrus coronaria</i> ( <i>Pyrus angustifolia</i> ) .....	72
Post Oak .....	139	<i>Pyrus coronaria, var. angustifolia</i> .....	72
Post Oak, Swamp .....	140	<i>Pyrus diversifolia</i> .....	73
Prickly Ash ( <i>Xanthoxylum Americanum</i> ) .....	29	<i>Pyrus fusca</i> .....	73
Prickly Ash ( <i>Xanthoxylum Clava-Herculis</i> ) .....	30	<i>Pyrus glandulosa</i> .....	77
Prince's Pine .....	201	<i>Pyrus microcarpa</i> .....	74
<i>Prinos deciduus</i> .....	37	<i>Pyrus ovalis</i> .....	55
<i>Pritchardia filamentosa</i> .....	217	<i>Pyrus rivularis</i> .....	73
Privet .....	112	<i>Pyrus sambucifolia</i> .....	74
<i>Prosopis Emoryi</i> .....	62	<i>Pyrus subcordata</i> .....	73
<i>Prosopis glandulosa</i> .....	61	<i>Pyrus Wangenheimiana</i> .....	84
<i>Prosopis juliflora</i> .....	61		
<i>Prosopis odorata</i> ( <i>Prosopis juliflora</i> ) .....	61	<b>Q.</b>	
<i>Prosopis odorata</i> ( <i>Prosopis pubescens</i> ) .....	62	Quaking Asp .....	171
<i>Prosopis pubescens</i> .....	62	<i>Quassia dioca</i> .....	32
<i>Prunus Americana</i> .....	65	<i>Quassia Simaruba</i> .....	32
<i>Prunus Americana, var. mollis</i> .....	65	Quercitron Oak .....	149
<i>Prunus angustifolia</i> .....	66	<i>Quercus acutidens</i> .....	155
<i>Prunus borealis</i> .....	66	<i>Quercus acutiglans</i> .....	146
<i>Prunus Canadensis</i> .....	68	<i>Quercus agrifolia</i> .....	146
<i>Prunus Capolin</i> .....	68	<i>Quercus agrifolia, var. frutescens</i> .....	147
<i>Prunus Capuli</i> .....	68	<i>Quercus alba</i> .....	137
<i>Prunus Carolina</i> .....	69	<i>Quercus alba minor</i> .....	139
<i>Prunus Caroliniana</i> .....	69	<i>Quercus alba palustris</i> .....	141
<i>Prunus cartilaginea</i> .....	68	<i>Quercus alba, var. ? Gunnisonii</i> .....	139
<i>Prunus Chicasa</i> .....	66	<i>Quercus alba, var. microcarpa</i> .....	137
<i>Prunus coccinea</i> .....	65	<i>Quercus alba, var. pinnatifida</i> .....	137
<i>Prunus demissa</i> .....	69	<i>Quercus alba, var. pinnatifido-sinuata</i> .....	137
<i>Prunus emarginata</i> .....	67	<i>Quercus alba, var. repanda</i> .....	137
<i>Prunus emarginata, var. mollis</i> .....	67	<i>Quercus alba, var. sinuata</i> .....	147
<i>Prunus hiemalis</i> ( <i>Prunus Americana</i> ) .....	65	<i>Quercus ambigua</i> .....	145
<i>Prunus hiemalis</i> ( <i>Prunus Americana, var. mollis</i> ) .....	65	<i>Quercus annulata</i> .....	152
<i>Prunus ilicifolia</i> .....	70	<i>Quercus aquatica</i> .....	150
<i>Prunus inistitia</i> .....	66	? <i>Quercus aquatica</i> ( <i>Quercus nigra</i> ) .....	152
? <i>Prunus lanceolata</i> .....	66	<i>Quercus aquatica, var. attenuata</i> .....	152
<i>Prunus Lusitanica</i> .....	69	<i>Quercus aquatica, var. cuneata</i> .....	152
<i>Prunus Mississippi</i> .....	65	<i>Quercus aquatica, var. elongata</i> .....	153
<i>Prunus mollis</i> ( <i>Prunus Americana, var. mollis</i> ) .....	65	<i>Quercus aquatica, var. heterophylla</i> .....	152
<i>Prunus mollis</i> ( <i>Prunus emarginata, var. mollis</i> ) .....	67	<i>Quercus aquatica, var. hybrida</i> .....	152
<i>Prunus nigra</i> .....	65	<i>Quercus aquatica, var. indivisa</i> .....	152
<i>Prunus Pennsylvania</i> .....	66	<i>Quercus aquatica, var. laurifolia</i> .....	155
? <i>Prunus persicifolia</i> .....	66	<i>Quercus aquatica, var. myrtifolia</i> .....	155
<i>Prunus pumila</i> .....	69	<i>Quercus Banisteri</i> .....	155
<i>Prunus sempervirens</i> .....	68	<i>Quercus berberidifolia</i> .....	141
<i>Prunus serotina</i> .....	69	<i>Quercus bicolor</i> .....	141
<i>Prunus serratifolia</i> .....	70	<i>Quercus bicolor, var. Michauxii</i> .....	141
<i>Prunus sphaerocarpa</i> .....	65	<i>Quercus bicolor, var. mollis</i> .....	141
<i>Prunus spinosa</i> .....	67	? <i>Quercus bicolor, var. platanoides</i> .....	155
<i>Prunus umbellata</i> .....	68	<i>Quercus Breweri</i> .....	149
<i>Prunus Virginiana</i> .....	68	<i>Quercus Californica</i> .....	142
<i>Prunus Virginiana</i> ( <i>Prunus serotina</i> ) .....	69	<i>Quercus Castanea</i> ( <i>Quercus prinoides</i> ) .....	142
<i>Prunus Virginiana, var. demissa</i> .....	55	<i>Quercus Castanea</i> ( <i>Quercus Prinus</i> ) .....	151
<i>Pseudacacia odorata</i> .....	30	<i>Quercus Catesbaei</i> .....	143
<i>Pseudopetalon glandulosum</i> .....	30	<i>Quercus Ohingwapi</i> .....	146
<i>Pseudopetalon tricarpum</i> .....	209	<i>Quercus chrysolepis</i> .....	146
<i>Pseudotsuga Douglasii</i> .....	210	<i>Quercus chrysolepis, var. vaccinifolia</i> .....	153
<i>Pseudotsuga Douglasii, var. macrocarpa</i> .....	214	<i>Quercus cinerea</i> .....	155
<i>Pseudotsuga magnifica</i> .....	214	<i>Quercus cinerea, var. pumila</i> .....	155
<i>Pseudotsuga nobilis</i> .....	89	<i>Quercus cinerea, var. sericea</i> .....	148
<i>Psidium Guaiava</i> .....		<i>Quercus coccinea</i> .....	147

	Page.		Page.
<i>Quercus coccinea</i> , var. <i>microcarpa</i> .....	148	<i>Quercus oblongifolia</i> , var. <i>breviloba</i> .....	148
<i>Quercus coccinea</i> , var. <i>rubra</i> .....	147	<i>Quercus obtusa</i> .....	152
<i>Quercus coccinea</i> , var. <i>tinctoria</i> .....	149	<i>Quercus obtusifolia</i> , var. ? <i>breviloba</i> .....	145
<i>Quercus confertifolia</i> .....	154	<i>Quercus obtusiloba</i> .....	138
<i>Quercus crassipocula</i> .....	146	<i>Quercus obtusiloba</i> , var. <i>depressa</i> .....	140
<i>Quercus cuneata</i> .....	150	<i>Quercus obtusiloba</i> , var. <i>parvifolia</i> .....	130
<i>Quercus decipiens</i> .....	144	<i>Quercus Orstediana</i> .....	138
<i>Quercus densiflora</i> .....	154	<i>Quercus oleoides</i> .....	145
<i>Quercus discolor</i> .....	145	<i>Quercus oliviformis</i> .....	140
<i>Quercus discolor</i> , var. <i>triloba</i> .....	151	<i>Quercus oxyadenia</i> .....	146
<i>Quercus Douglasii</i> .....	143	<i>Quercus palustris</i> .....	151
<i>Quercus Douglasii</i> , var. <i>Gambelii</i> .....	130	<i>Quercus palustris</i> ( <i>Quercus rubra</i> , var. <i>Texana</i> ) .....	148
<i>Quercus Douglasii</i> , var. ? <i>Neei</i> .....	138	<i>Quercus parvifolia</i> .....	130
? <i>Quercus Drummondii</i> .....	130	<i>Quercus Phellos</i> .....	151
<i>Quercus dumosa</i> .....	155	<i>Quercus Phellos angustifolia</i> .....	154
<i>Quercus dumosa</i> , var. <i>bullata</i> .....	155	<i>Quercus Phellos</i> × <i>coccinea</i> .....	153
<i>Quercus Durandii</i> .....	145	<i>Quercus Phellos latifolia</i> .....	154
<i>Quercus echinacea</i> .....	155	<i>Quercus Phellos pumila</i> .....	155
<i>Quercus echinoides</i> .....	155	<i>Quercus Phellos</i> × <i>tinctoria</i> .....	153
<i>Quercus elongata</i> .....	150	<i>Quercus Phellos</i> , var. ( <i>Quercus heterophylla</i> ) .....	153
<i>Quercus Emoryi</i> .....	146	<i>Quercus Phellos</i> , var. <i>arenaria</i> .....	155
? <i>Quercus Emoryi</i> ( <i>Quercus undulata</i> , var. <i>Gambelii</i> ) .....	130	<i>Quercus Phellos</i> , var. <i>cinerea</i> .....	153
<i>Quercus falcata</i> .....	150	<i>Quercus Phellos</i> , var. <i>humilis</i> .....	154
<i>Quercus falcata</i> , var. <i>Ludovisiana</i> .....	151	<i>Quercus Phellos</i> , var. <i>imbricaria</i> .....	154
<i>Quercus falcata</i> , var. <i>pagodaefolia</i> .....	151	<i>Quercus Phellos</i> , var. <i>laurifolia</i> .....	152
<i>Quercus falcata</i> , var. <i>triloba</i> .....	151	<i>Quercus Phellos</i> , var. <i>sempervirens</i> .....	145
<i>Quercus fulvescens</i> .....	146	<i>Quercus Phellos</i> , var. <i>sericea</i> .....	155
<i>Quercus Gambelii</i> .....	130	<i>Quercus Phellos</i> , var. <i>viridis</i> .....	154
<i>Quercus Garryana</i> .....	138	<i>Quercus prinoides</i> .....	142
<i>Quercus Georgiana</i> .....	155	<i>Quercus Prinus</i> .....	142
<i>Quercus grisea</i> .....	144	<i>Quercus Prinus</i> β. ( <i>Quercus cinerea</i> ) .....	153
<i>Quercus hastata</i> .....	146	<i>Quercus Prinus</i> ( <i>Quercus Michauxii</i> ) .....	141
<i>Quercus hemisphaerica</i> .....	152	<i>Quercus Prinus Chinquapin</i> .....	143
<i>Quercus hemisphaerica</i> , var. <i>nana</i> .....	152	<i>Quercus Prinus humilis</i> .....	142
<i>Quercus heterophylla</i> .....	153	<i>Quercus Prinus palustris</i> .....	141
<i>Quercus Hindsi</i> .....	138	? <i>Quercus Prinus platanoides</i> .....	141
<i>Quercus humilis</i> .....	153	<i>Quercus Prinus pumila</i> .....	142
<i>Quercus hypoleuca</i> .....	154	<i>Quercus Prinus tomentosa</i> .....	141
<i>Quercus ilicifolia</i> .....	155	<i>Quercus Prinus</i> , var. <i>acuminata</i> .....	142
<i>Quercus imbricaria</i> .....	154	<i>Quercus Prinus</i> , var. <i>bicolor</i> .....	141
<i>Quercus Jacobi</i> .....	138	<i>Quercus Prinus</i> , var. <i>discolor</i> .....	141
<i>Quercus Kelloggii</i> .....	140	<i>Quercus Prinus</i> , var. <i>lata</i> .....	142
? <i>Quercus laevis</i> .....	151	<i>Quercus Prinus</i> , var. <i>Michauxii</i> .....	141
<i>Quercus laurifolia</i> .....	152	<i>Quercus Prinus</i> , var. <i>monticola</i> .....	142
<i>Quercus laurifolia hybrida</i> .....	152	<i>Quercus Prinus</i> , var. <i>oblongata</i> .....	143
<i>Quercus laurifolia</i> , var. <i>acuta</i> .....	152	<i>Quercus Prinus</i> , var. <i>prinoides</i> .....	143
<i>Quercus laurifolia</i> , var. <i>obtusa</i> .....	152	<i>Quercus pumila</i> .....	155
<i>Quercus lobata</i> .....	138	<i>Quercus pungens</i> .....	144
<i>Quercus lobata</i> , var. <i>fruticosa</i> .....	155	<i>Quercus Ransomii</i> .....	138
<i>Quercus lobulata</i> .....	150	<i>Quercus reticulata</i> .....	144
<i>Quercus longiglandula</i> .....	138	? <i>Quercus reticulata</i> , var. <i>Greggii</i> .....	144
<i>Quercus lyrata</i> .....	140	<i>Quercus retusa</i> .....	145
<i>Quercus macrocarpa</i> .....	140	<i>Quercus rubra</i> .....	147
<i>Quercus macrocarpa</i> , var. <i>abbreviata</i> .....	140	<i>Quercus rubra</i> β. ( <i>Quercus coccinea</i> ) .....	148
<i>Quercus macrocarpa</i> , var. <i>minor</i> .....	140	<i>Quercus rubra</i> ( <i>Quercus Kelloggii</i> ) .....	149
<i>Quercus macrocarpa</i> , var. <i>oliviformis</i> .....	140	<i>Quercus rubra</i> ( <i>Quercus tinctoria</i> ) .....	149
<i>Quercus Marylandica</i> .....	150	<i>Quercus rubra maxima</i> .....	147
<i>Quercus Michauxii</i> .....	141	<i>Quercus rubra montana</i> .....	150
<i>Quercus montana</i> .....	142	<i>Quercus rubra ramosissima</i> .....	151
<i>Quercus Morehus</i> .....	147	<i>Quercus rubra</i> , var. <i>dissecta</i> .....	151
<i>Quercus Muhlenbergii</i> .....	143	<i>Quercus rubra</i> var. <i>latifolia</i> .....	147
<i>Quercus myrtifolia</i> .....	155	<i>Quercus rubra</i> , var. <i>montana</i> .....	147
<i>Quercus nana</i> .....	152	<i>Quercus rubra</i> , var. <i>runcinata</i> .....	147
<i>Quercus Neei</i> .....	138	<i>Quercus rubra</i> , var. <i>Texana</i> .....	148
<i>Quercus nigra</i> .....	150	<i>Quercus San-Sabana</i> .....	145
<i>Quercus nigra</i> ( <i>Quercus aquatica</i> ) .....	152	<i>Quercus sempervirens</i> .....	145
<i>Quercus nigra</i> ( <i>Quercus tinctoria</i> ) .....	140	<i>Quercus sericea</i> .....	155
<i>Quercus nigra aquatica</i> .....	152	? <i>Quercus Shumardii</i> .....	149
<i>Quercus nigra digitata</i> .....	152	? <i>Quercus sinuata</i> .....	137
<i>Quercus nigra integrifolia</i> .....	150	<i>Quercus Sonomensis</i> .....	140
<i>Quercus nigra trifida</i> .....	152	<i>Quercus spicata</i> .....	144
<i>Quercus nigra</i> , var. ( <i>Quercus heterophylla</i> ) .....	153	<i>Quercus stellata</i> .....	139
<i>Quercus nigra</i> , var. <i>latifolia</i> .....	150	<i>Quercus stellata</i> , var. <i>depressa</i> .....	140
<i>Quercus nigra oblongifolia</i> .....	143	<i>Quercus stellata</i> , var. <i>Floridana</i> .....	139
? <i>Quercus oblongifolia</i> .....	146	<i>Quercus stellata</i> , var. <i>Utahensis</i> .....	130

	Page.		Page.
<i>Quercus Texana</i> .....	148	<i>Rhus Canadense</i> .....	52
<i>Quercus tinctoria</i> .....	149	<i>Rhus copallina</i> .....	53
<i>Quercus tinctoria</i> , var. <i>angulosa</i> .....	149	<i>Rhus copallina</i> , var. <i>angustialata</i> .....	53
<i>Quercus tinctoria</i> , var. <i>Californica</i> .....	149	? <i>Rhus copallina</i> , var. <i>angustifolia</i> .....	53
<i>Quercus tinctoria</i> , var. <i>sinuosa</i> .....	149	<i>Rhus copallina</i> , var. <i>integrifolia</i> .....	53
<i>Quercus triloba</i> .....	160	<i>Rhus copallina</i> , var. <i>lanceolata</i> .....	53
? <i>Quercus uliginosa</i> .....	152	? <i>Rhus copallina</i> , var. <i>latialata</i> .....	53
<i>Quercus undulata</i> .....	155	? <i>Rhus copallina</i> , var. <i>latifolia</i> .....	53
<i>Quercus undulata</i> ( <i>Quercus Durandii</i> ).....	145	<i>Rhus copallina</i> , var. <i>leucantha</i> .....	53
<i>Quercus undulata</i> , var. <i>Gambelii</i> .....	139	? <i>Rhus copallina</i> , var. <i>serrata</i> .....	53
<i>Quercus undulata</i> , var. <i>grisea</i> .....	144	<i>Rhus cotinoides</i> .....	52
<i>Quercus undulata</i> , var. <i>oblongata</i> .....	143	<i>Rhus cotinus</i> ?.....	52
<i>Quercus undulata</i> , var. <i>pungens</i> .....	144	<i>Rhus glabra</i> .....	53
<i>Quercus undulata</i> , var. <i>Wrightii</i> .....	144	<i>Rhus hypselodendron</i> .....	52
<i>Quercus vaccinifolia</i> .....	146	<i>Rhus leucantha</i> .....	53
? <i>Quercus velutina</i> .....	149	<i>Rhus Metopium</i> .....	54
? <i>Quercus villosa</i> .....	139	<i>Rhus Toxicodendron</i> .....	54
<i>Quercus virens</i> .....	145	<i>Rhus typhina</i> .....	52
<i>Quercus Virginiana</i> .....	145	<i>Rhus typhina</i> , var. <i>laciniata</i> .....	52
<i>Quercus Wislizeni</i> .....	147	<i>Rhus typhina</i> , var. <i>viridiflora</i> .....	52
<b>E.</b>			
<i>Randia clusicefolia</i> .....	95	<i>Rhus venenata</i> .....	54
<i>Rapanea Guyanensis</i> .....	99	<i>Rhus vernix</i> .....	54
Rattle-box.....	100	<i>Rhus viridiflora</i> .....	52
Red Ash.....	109	River Birch.....	161
Red Bay.....	118	River Cottonwood.....	172
Red Birch.....	161	<i>Robinia fragilis</i> .....	55
Red Cedar ( <i>Juniperus Virginiana</i> ).....	183	<i>Robinia glutinosa</i> .....	56
Red Cedar ( <i>Thuja gigantea</i> ).....	177	<i>Robinia Neo-Mexicana</i> .....	56
Red Cherry, Wild.....	66	<i>Robinia Pseudacacia</i> .....	55
Red Cypress.....	184	<i>Robinia viscosa</i> .....	56
Red Elm.....	122	Rock Chestnut Oak.....	142
Red Fir ( <i>Abies magnifica</i> ).....	214	Rock Elm.....	123
Red Fir ( <i>Abies nobilis</i> ).....	214	Rock Maple.....	48
Red Fir ( <i>Pseudotsuga Douglasii</i> ).....	260	ROSACEÆ.....	64-85
Red Gum.....	86	Rose Bay.....	99
Red Haw ( <i>Crataegus coccinea</i> ).....	78	Rosemary Pine.....	197
Red Haw ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	83	Royal Palm.....	218
Red Ironwood.....	39	RUBIACEÆ.....	95, 96
Red Maple.....	50	Rum Cherry.....	98
Red Mulberry.....	128	RUTACEÆ.....	20-32
Red Oak ( <i>Quercus falcata</i> ).....	151	<b>S.</b>	
Red Oak ( <i>Quercus rubra</i> ).....	148	Sabal Palmetto.....	217
Red Oak ( <i>Quercus rubra</i> , var. <i>Texana</i> ).....	148	Saffron Plum.....	103
Red Pine.....	102	Saguaro.....	90
Red Stopper.....	89	SALICACEÆ.....	165-175
Redbud ( <i>Cercis Canadensis</i> ).....	61	<i>Salix</i> .....?	170
Redbud ( <i>Cercis reniformis</i> ).....	61	? <i>Salix ambigua</i> .....	165
Redwood.....	185	<i>Salix amygdaloides</i> .....	166
<i>Reynoldsii latifolia</i> .....	39	<i>Salix argophylla</i> .....	168
? <i>Rhamnidium revolutum</i> .....	39	<i>Salix arguta</i> .....	167
RHAMNACEÆ.....	89-92	<i>Salix arguta</i> , var. <i>lasiantha</i> .....	167
<i>Rhamnus alniifolia</i> .....	41	<i>Salix Bigelovii</i> .....	170
<i>Rhamnus Californica</i> .....	40	<i>Salix Bigelovii</i> , var. <i>fuscior</i> .....	170
<i>Rhamnus Californica</i> , var. <i>tomentella</i> .....	41	? <i>Salix brachycarpa</i> .....	168
<i>Rhamnus Caroliniana</i> .....	40	<i>Salix brachystachys</i> .....	170
<i>Rhamnus ellipticus</i> .....	41	<i>Salix brachystachys</i> , var. <i>Scouleriana</i> .....	170
<i>Rhamnus ferrea</i> .....	39	<i>Salix Caroliniana</i> .....	165
? <i>Rhamnus laevigatus</i> .....	39	<i>Salix chlorophylla</i> , var. <i>pellita</i> .....	171
<i>Rhamnus laurifolia</i> .....	40	<i>Salix cordata</i> .....	170
<i>Rhamnus oleifolia</i> .....	40	<i>Salix cordata</i> , var. <i>falcata</i> .....	165
<i>Rhamnus Purshiana</i> .....	41	<i>Salix cordata</i> , var. <i>vestita</i> .....	170
<i>Rhamnus tomentellus</i> .....	41	<i>Salix crassa</i> .....	169
<i>Rhizophora Americana</i> .....	86	<i>Salix cuneata</i> .....	171
<i>Rhizophora Mangle</i> .....	86	<i>Salix discolor</i> .....	169
<i>Rhizophora racemosa</i> .....	86	<i>Salix discolor</i> , var. <i>oriocephala</i> .....	169
RUIZOPHORACEÆ.....	86, 87	<i>Salix discolor</i> , var. <i>prinoides</i> .....	169
<i>Rhododendron maximum</i> .....	99	<i>Salix eriocephala</i> .....	169
<i>Rhododendron maximum</i> , var. <i>album</i> .....	99	<i>Salix exigua</i> .....	168
<i>Rhododendron maximum</i> , var. <i>purpureum</i> .....	99	<i>Salix falcata</i> .....	165
<i>Rhododendron maximum</i> , var. <i>roseum</i> .....	99	<i>Salix Fendleriana</i> .....	167
<i>Rhododendron procerum</i> .....	99	<i>Salix flavescens</i> .....	169
<i>Rhododendron purpureum</i> .....	99	<i>Salix flavescens</i> ( <i>Salix flavescens</i> , var. <i>Scouleriana</i> ).....	170
<i>Rhododendron Purshii</i> .....	99	<i>Salix flavescens</i> , var. <i>Scouleriana</i> .....	170
<i>Rhus arborescens</i> .....	33	<i>Salix flavo-virens</i> .....	165
		<i>Salix fluviatilis</i> .....	168

	Page.		Page.
Silver-bell Tree ( <i>Halesia diptera</i> ).....	105	Stopper, Red.....	89
Silver-bell Tree ( <i>Halesia tetraptera</i> ).....	106	Stopper, Spanish.....	88
Silver Maple.....	49	Stopper, White.....	89
Silver-top Palmetto.....	218	Striped Dogwood.....	46
<i>Simaruba amara</i> .....	32	Striped Maple.....	46
<i>Simaruba glauca</i> .....	82	<i>Strombocarpa odorata</i> .....	62
<i>Simaruba medicinalis</i> .....	32	<i>Strombocarpa pubescens</i> .....	62
SIMARUBACEÆ.....	32	Strong Bark.....	114
Sitka Cypress.....	178	<i>Styphnolobium affine</i> .....	58
Slash Pine.....	202	STRYACACEÆ.....	105, 106
Slippery Elm ( <i>Tremontia Californica</i> ).....	26	Sugarberry.....	126
Slippery Elm ( <i>Ulmus fulva</i> ).....	122	Sugar Maple.....	48
Sloe.....	67	Sugar Maple, Black.....	49
Sloe, Black.....	67	Sugar Pine.....	188
Small-fruited Haw.....	81	Sugar Tree.....	48
Smooth Alder.....	164	Sumach, Coral.....	54
Snow-drop Tree ( <i>Halesia diptera</i> ).....	105	Sumach, Dwarf.....	53
Snow-drop Tree ( <i>Halesia tetraptera</i> ).....	106	Sumach, Poison.....	54
Soapberry ( <i>Sapindus marginatus</i> ).....	44	Sumach, Staghorn.....	53
Soapberry ( <i>Sapindus Saponaria</i> ).....	45	Summer Haw ( <i>Crataegus flava</i> ).....	83
Soft Maple ( <i>Acer dasycarpum</i> ).....	40	Summer Haw ( <i>Crataegus flava</i> , var. <i>pubescens</i> ).....	83
Soft Maple ( <i>Acer rubrum</i> ).....	50	Suwarrow.....	90
<i>Sophora affinis</i> .....	58	Swamp Cottonwood.....	172
<i>Sophora secundiflora</i> .....	57	Swamp Hickory ( <i>Carya amara</i> ).....	135
<i>Sophora speciosa</i> .....	57	Swamp Hickory ( <i>Carya aquatica</i> ).....	136
<i>Sorbus Americana</i> .....	73	Swamp Laurel.....	20
<i>Sorbus Americana</i> , var. <i>microcarpa</i> .....	74	Swamp Maple.....	50
<i>Sorbus aucuparia</i> ( <i>Pyrus Americana</i> ).....	73	Swamp Pine.....	202
<i>Sorbus aucuparia</i> ( <i>Pyrus sambucifolia</i> ).....	74	Swamp Post Oak.....	140
<i>Sorbus aucuparia</i> , var. <i>a.</i> ( <i>Pyrus Americana</i> , var. <i>microcarpa</i> ).....	74	Swamp Spanish Oak.....	152
<i>Sorbus aucuparia</i> , var. <i>b.</i> ( <i>Pyrus sambucifolia</i> ).....	74	Swamp White Oak.....	141
<i>Sorbus aucuparia</i> , var. <i>Americana</i> .....	73	Sweet Bay.....	20
<i>Sorbus humifusa</i> .....	73	Sweet Birch.....	162
<i>Sorbus microcarpa</i> .....	74	Sweet Buckeye.....	43
<i>Sorbus riparia</i> .....	74	Sweet Gum.....	86
<i>Sorbus sambucifolia</i> .....	74	Sweet Leaf.....	105
<i>Sorbus Sitchensis</i> .....	74	Sweet Locust.....	59
Sorrel Tree.....	98	Sweet-scented Crab.....	72
Sour Gum.....	92	Swietenia Mahogoni.....	33
Sour Tupelo.....	91	<i>Swietenia Senegalensis</i> .....	33
Sourwood.....	98	Switch-bud Hickory.....	134
Southern Buckthorn.....	103	Sycamore ( <i>Platanus occidentalis</i> ).....	129
Southern Crab Apple.....	72	Sycamore ( <i>Platanus racemosa</i> ).....	129
Southern Pine.....	202	Sycamore ( <i>Platanus Wrightii</i> ).....	130
Spanish Bayonet ( <i>Yucca baccata</i> ).....	219	Symplocos tinctoria.....	105
Spanish Bayonet ( <i>Yucca canaliculata</i> ).....	218	<b>T.</b>	
Spanish Bayonet ( <i>Yucca elata</i> ).....	219	Table-mountain Pine.....	199
Spanish Buckeye.....	44	Tacamahac.....	173
Spanish Oak.....	151	Tallowberry.....	28
Spanish Oak, Swamp.....	152	Tallow Nut.....	34
Spanish Stopper.....	88	Tamarack ( <i>Larix Americana</i> ).....	215
Speckled Alder.....	165	Tamarack ( <i>Larix occidentalis</i> ).....	216
Spice Tree.....	120	Tamarack ( <i>Pinus Murrayana</i> ).....	195
Spindle Tree.....	38	Tamarind, Wild.....	64
<i>Spiraea Californica</i> .....	70	Tanbark Oak.....	155
Spoonwood.....	98	Tan Bay.....	25
Spruce, Black.....	203	<i>Taxodi species</i> ( <i>Sequoia sempervirens</i> ).....	185
Spruce, Blue.....	205	<i>Taxodium ascendens</i> .....	183
Spruce Pine ( <i>Pinus clausa</i> ).....	199	<i>Taxodium distichum</i> .....	183
Spruce Pine ( <i>Pinus glabra</i> ).....	201	<i>Taxodium distichum fastigiatum</i> .....	183
Spruce Pine ( <i>Pinus mitis</i> ).....	200	<i>Taxodium distichum</i> , var. <i>microphyllum</i> .....	183
Spruce Pine ( <i>Pinus Murrayana</i> ).....	195	<i>Taxodium distichum</i> , var. <i>nutans</i> .....	183
Spruce, Tide-land.....	206	<i>Taxodium distichum</i> , var. <i>patens</i> .....	183
Spruce, White ( <i>Picea alba</i> ).....	204	<i>Taxodium giganteum</i> .....	184
Spruce, White ( <i>Picea Engelmanni</i> ).....	205	<i>Taxodium microphyllum</i> .....	183
Spruce, White ( <i>Picea pungens</i> ).....	205	<i>Taxodium sempervirens</i> .....	185
Stag Bush.....	94	<i>Taxodium Washingtonianum</i> .....	184
Staghorn Sumach.....	53	<i>Taxus baccata</i> ( <i>Taxus brevifolia</i> ).....	185
Star-leaved Gum.....	86	<i>Taxus baccata</i> , var. <i>Canadensis</i> .....	185
STERCULIACEÆ.....	26	<i>Taxus Bourserii</i> .....	185
Stinking Cedar ( <i>Torreya Californica</i> ).....	186	<i>Taxus brevifolia</i> .....	185
Stinking Cedar ( <i>Torreya taxifolia</i> ).....	186	<i>Taxus Canadensis</i> .....	185
Stopper ( <i>Eugenia longipes</i> ).....	89	<i>Taxus Floridana</i> .....	186
Stopper ( <i>Eugenia monticola</i> ).....	89	<i>Taxus Lindleyana</i> .....	185
Stopper, Gurgeon.....	88	<i>Taxus montana</i> .....	186

	Page.		Page.
Silver-bell Tree ( <i>Halesia diptera</i> )	105	Stopper, Red	89
Silver-bell Tree ( <i>Halesia tetraptera</i> )	106	Stopper, Spanish	88
Silver Maple	40	Stopper, White	89
Silver-top Palmetto	218	Striped Dogwood	46
<i>Simaruba amara</i>	82	Striped Maple	46
<i>Simaruba glauca</i>	82	<i>Strombocarpa odorata</i>	62
<i>Simaruba medicinalis</i>	82	<i>Strombocarpa pubescens</i>	62
SIMARUBACEÆ	82	Strong Bark	114
Sitka Cypress	178	<i>Styphnolobium affine</i>	58
Slash Pine	202	STRACACEÆ	105, 106
Slippery Elm ( <i>Fremontia Californica</i> )	26	Sugarberry	126
Slippery Elm ( <i>Ulmus fulva</i> )	122	Sugar Maple	48
Sloe	67	Sugar Maple, Black	49
Sloe, Black	67	Sugar Pine	188
Small-fruited Haw	81	Sugar Tree	48
Smooth Alder	164	Sumach, Coral	54
Snow-drop Tree ( <i>Halesia diptera</i> )	105	Sumach, Dwarf	53
Snow-drop Tree ( <i>Halesia tetraptera</i> )	106	Sumach, Poison	54
Soapberry ( <i>Sapindus marginatus</i> )	44	Sumach, Staghorn	53
Soapberry ( <i>Sapindus saponaria</i> )	45	Summer Haw ( <i>Crataegus flava</i> )	83
Soft Maple ( <i>Acer dasycarpum</i> )	49	Summer Haw ( <i>Crataegus flava</i> , var. <i>pubescens</i> )	83
Soft Maple ( <i>Acer rubrum</i> )	50	Suwarrow	90
Sophora affinis	58	Swamp Cottonwood	172
Sophora secundiflora	57	Swamp Hickory ( <i>Carya amara</i> )	135
<i>Sophora speciosa</i>	57	Swamp Hickory ( <i>Carya aquatica</i> )	136
<i>Sorbus Americana</i>	73	Swamp Laurel	20
<i>Sorbus Americana</i> , var. <i>microcarpa</i>	74	Swamp Maple	50
<i>Sorbus aucuparia</i> ( <i>Pyrus Americana</i> )	73	Swamp Pine	202
<i>Sorbus aucuparia</i> ( <i>Pyrus sambucifolia</i> )	74	Swamp Post Oak	140
<i>Sorbus aucuparia</i> , var. <i>a.</i> ( <i>Pyrus Americana</i> , var. <i>microcarpa</i> )	74	Swamp Spanish Oak	152
<i>Sorbus aucuparia</i> , var. <i>β.</i> ( <i>Pyrus sambucifolia</i> )	74	Swamp White Oak	141
<i>Sorbus aucuparia</i> , var. <i>Americana</i>	73	Sweet Bay	20
<i>Sorbus lumifusa</i>	73	Sweet Birch	162
<i>Sorbus microcarpa</i>	74	Sweet Buckeye	43
<i>Sorbus riparia</i>	74	Sweet Gum	86
<i>Sorbus sambucifolia</i>	74	Sweet Leaf	105
<i>Sorbus Stitchensis</i>	74	Sweet Locust	59
Sorrel Tree	98	Sweet-scented Crab	72
Sour Gum	92	Swietenia Mahogoni	33
Sour Tupelo	91	<i>Swietenia Senegalensis</i>	33
Sourwood	98	Switch-bud Hickory	134
Southern Buckthorn	103	Sycamore ( <i>Platanus occidentalis</i> )	129
Southern Crab Apple	72	Sycamore ( <i>Platanus racemosa</i> )	129
Southern Pine	202	Sycamore ( <i>Platanus Wrightii</i> )	130
Spanish Bayonet ( <i>Yucca baccata</i> )	219	Symplocos tinctoria	105
Spanish Bayonet ( <i>Yucca canaliculata</i> )	218		
Spanish Bayonet ( <i>Yucca elata</i> )	219	<b>T.</b>	
Spanish Buckeye	44	Table-mountain Pine	199
Spanish Oak	151	Tacamahac	173
Spanish Oak, Swamp	152	Tallowberry	28
Spanish Stopper	88	Tallow Nut	34
Speckled Alder	165	Tamarack ( <i>Larix Americana</i> )	215
Spice Tree	120	Tamarack ( <i>Larix occidentalis</i> )	216
Spindle Tree	38	Tamarack ( <i>Pinus Murrayana</i> )	195
<i>Spiraea Californica</i>	70	Tamarind, Wild	64
Spoonwood	98	Tanbark Oak	155
Spruce, Black	203	Tan Bay	25
Spruce, Blue	205	<i>Taxodium</i> species ( <i>Sequoia sempervirens</i> )	185
Spruce Pine ( <i>Pinus clausa</i> )	199	<i>Taxodium adscendens</i>	183
Spruce Pine ( <i>Pinus glabra</i> )	201	<i>Taxodium distichum</i>	183
Spruce Pine ( <i>Pinus mitis</i> )	200	<i>Taxodium distichum fastigiatum</i>	183
Spruce Pine ( <i>Pinus Murrayana</i> )	195	<i>Taxodium distichum</i> , var. <i>microphyllum</i>	183
Spruce, Tide-land	206	<i>Taxodium distichum</i> , var. <i>nutans</i>	183
Spruce, White ( <i>Picea alba</i> )	204	<i>Taxodium distichum</i> , var. <i>patens</i>	183
Spruce, White ( <i>Picea Engelmanni</i> )	205	<i>Taxodium giganteum</i>	184
Spruce, White ( <i>Picea pungens</i> )	205	<i>Taxodium microphyllum</i>	183
Stag Bush	94	<i>Taxodium sempervirens</i>	185
Staghorn Sumach	53	<i>Taxodium Washingtonianum</i>	184
Star-leaved Gum	86	<i>Taxus baccata</i> ( <i>Taxus brevifolia</i> )	185
STERCULIACEÆ	26	<i>Taxus baccata</i> , var. <i>Canadensis</i>	185
Stinking Cedar ( <i>Torreya Californica</i> )	186	<i>Taxus Boursierii</i>	185
Stinking Cedar ( <i>Torreya taxifolia</i> )	185	<i>Taxus brevifolia</i>	185
Stopper ( <i>Eugenia longipes</i> )	89	<i>Taxus Canadensis</i>	185
Stopper ( <i>Eugenia monticola</i> )	89	<i>Taxus Florida</i>	186
Stopper, Gurgeon	88	<i>Taxus Lindleyana</i>	185
		<i>Taxus montana</i>	186

	Page.		Page.
<b>TERNSTROMIACEÆ</b>			
<i>Tetranthera Californica</i> .....	25, 26	<i>Tsuga Caroliniana</i> .....	207
<i>Thatch, Brickley</i> .....	218	<i>Tsuga Douglasii</i> .....	209
<i>Thatch, Brittle</i> .....	218	<i>Tsuga Lindleyana</i> .....	200
<i>The Joshua</i> .....	219	<i>Tsuga Mertensiana</i> .....	207
<i>Thorn, Black</i> .....	79	<i>Tsuga Pattoniana</i> .....	208
<i>Thorn, Cockspur</i> .....	76	<i>Tulipastrum Americanum</i> .....	20
<i>Thorn, Newcastle</i> .....	76	<i>Tulipastrum Americanum</i> , var. <i>subcordatum</i> .....	20
<i>Thorn, Washington</i> .....	81	<i>Tulipifera Liriodendron</i> .....	22
<i>Thorn, White</i> .....	78	<i>Tulip Tree</i> .....	22
<i>Three-thorned Acacia</i> .....	59	<i>Tupelo</i> .....	92
<i>Thrinax argentea</i> .....	218	<i>Tupelo Gum</i> .....	93
<i>Thrinax Garberi</i> .....	217	<i>Tupelo, Large</i> .....	93
<i>Thrinax parviflora</i> .....	217	<i>Tupelo, Sour</i> .....	91
<i>Thuja Craigana</i> .....	176	<i>Turkey Oak</i> .....	151
<i>Thuja excelsa</i> .....	178	<b>U.</b>	
<i>Thuja gigantea</i> .....	177	<i>Ulmus alata</i> .....	124
<i>Thuja gigantea (Libocedrus decurrens)</i> .....	176	<i>Ulmus alba</i> .....	128
<i>Thuja Lobbii</i> .....	177	<i>Ulmus Americana</i> .....	123
<i>Thuja Menziesii</i> .....	177	<i>Ulmus Americana (Ulmus racemosa)</i> .....	123
<i>Thuja obtusa</i> .....	176	<i>Ulmus Americana</i> , var. <i>alata</i> .....	124
<i>Thuja occidentalis</i> .....	176	<i>Ulmus Americana</i> , var. <i>alba</i> .....	123
<i>Thuja occidentalis</i> , var. <i>plicata</i> .....	177	<i>Ulmus Americana</i> , var. <i>aspera</i> .....	123
<i>Thuja odorata</i> .....	176	<i>Ulmus Americana</i> , var. <i>Bartramii</i> .....	123
<i>Thuja plicata</i> .....	177	<i>Ulmus Americana</i> , var. <i>pendula</i> .....	123
<i>Thuja Sibirica</i> .....	176	<i>Ulmus Americana</i> , var. <i>rubra</i> .....	122
<i>Thuja sphaeroidalis</i> .....	177	<i>Ulmus Americana</i> , var. <i>scabra</i> .....	123
<i>Thuja sphaeroides</i> .....	177	<i>Ulmus aquatica</i> .....	124
<i>Thuja Wareana</i> .....	176	<i>Ulmus crassifolia</i> .....	122
<i>Thuyopsis borealis</i> .....	178	<i>? Ulmus crispus</i> .....	122
<i>Thuyopsis cupressoides</i> .....	178	<i>Ulmus Florida</i> .....	123
<i>Thuyopsis Tchugatskoy</i> .....	178	<i>Ulmus fulva</i> .....	122
<i>Thuyopsis Tchugatskoyae</i> .....	178	<i>Ulmus mollifolia</i> .....	123
<i>Thylax fraxinaceum</i> .....	29	<i>? Ulmus nemoralis</i> .....	124
<i>Thide-land Spruce</i> .....	206	<i>Ulmus opaca</i> .....	122
<i>Tilia alba</i> .....	27	<i>Ulmus pendula</i> .....	123
<i>Tilia Americana</i> .....	26	<i>Ulmus pubescens</i> .....	122
<i>Tilia Americana (Tilia Americana, var. pubescens)</i> .....	27	<i>Ulmus pumila</i> .....	124
<i>Tilia Americana, var. heterophylla</i> .....	27	<i>Ulmus racemosa</i> .....	123
<i>Tilia Americana, var. pubescens</i> .....	27	<i>Ulmus rubra</i> .....	122
<i>Tilia Americana, var. Walleri</i> .....	27	<i>Umbellularia Californica</i> .....	120
<i>Tilia Canadensis</i> .....	26	<i>Umbrella Tree</i> .....	21
<i>Tilia Caroliniana</i> .....	27	<i>Ungnadia heptaphylla</i> .....	44
<i>Tilia glabra</i> .....	26	<i>Ungnadia heterophylla</i> .....	44
<i>Tilia grata</i> .....	27	<i>Ungnadia speciosa</i> .....	44
<i>Tilia heterophylla</i> .....	27	<i>Upland Willow Oak</i> .....	153
<i>Tilia heterophylla</i> , var. <i>alba</i> .....	27	<i>Urostigma pedunculatum</i> .....	127
<i>Tilia latifolia</i> .....	26	<b>URTICACEÆ</b> 122-128	
<i>Tilia laxiflora (Tilia Americana, var. pubescens)</i> .....	27	<i>Uvaria triloba</i> .....	23
<i>Tilia laxiflora (Tilia heterophylla)</i> .....	27	<b>V.</b>	
<i>Tilia neglecta</i> .....	26	<i>Vaccinium arboreum</i> .....	96
<i>Tilia nigra</i> .....	26	<i>Vaccinium diffusum</i> .....	96
<i>Tilia pubescens</i> .....	27	<i>Vaccinium mucronatum</i> .....	96
<i>Tilia pubescens, var. leptophylla</i> .....	27	<i>Valparaiso Oak</i> .....	146
<i>? Tilia stenopetala</i> .....	27	<i>Vauquelinia corymbosa</i> .....	70
<i>Tilia truncata</i> .....	27	<i>Vauquelinia Torreyi</i> .....	70
<b>TILIACEÆ</b> 26-28			
<i>Tili</i> .....	33	<b>VERBENACEÆ</b> 110, 117	
<i>Tollon</i> .....	84	<i>Viburnum Lentago</i> .....	94
<i>Toothache Tree (Xanthoxylum Americanum)</i> .....	29	<i>Viburnum prunifolium</i> .....	94
<i>Toothache Tree (Xanthoxylum Clava-Herculis)</i> .....	80	<i>Viburnum prunifolium</i> , var. <i>ferrugineum</i> .....	94
<i>Torchwood</i> .....	33	<i>Viburnum pyriformum</i> .....	94
<i>Tornilla</i> .....	62	<i>Vine Maple</i> .....	47
<i>Torreya Californica</i> .....	186	<i>Virgilia lutea</i> .....	57
<i>Torreya Myristica</i> .....	186	<i>Virgilia secundiflora</i> .....	57
<i>Torreya taxifolia</i> .....	186	<b>W.</b>	
<i>Toxicodendron arborescens</i> .....	33	<i>Wafer Ash</i> .....	81
<i>Toxylon Maclura</i> .....	123	<i>Wahoo (Euonymus atropurpureus)</i> .....	88
<i>Toyon</i> .....	84	<i>Wahoo (Tilia heterophylla)</i> .....	28
<i>Trefoil, Shrubby</i> .....	31	<i>Wahoo (Ulmus alata)</i> .....	124
<i>Trilopus dentata</i> .....	85	<i>Wallia cinerea</i> .....	130
<i>Trilopus nigra</i> .....	85	<i>Wallia nigra</i> .....	131
<i>Trilopus parvifolia</i> .....	85	<i>Walnut</i> .....	131
<i>Trilopus rotundifolia</i> .....	85	<i>Walnut, Black</i> .....	131
<i>Trilopus Virginiana</i> .....	85	<i>Walnut, White</i> .....	130
<i>Tsuga Canadensis</i> .....	206	<i>Washingtonia filifera</i> .....	217
		<i>Washington Thorn</i> .....	81

	Page.		Page.
Water Ash .....	110	Willow ( <i>Salix amygdaloides</i> ) .....	166
Water Beech ( <i>Carpinus Caroliniana</i> ) .....	150	Willow ( <i>Salix laevigata</i> ) .....	167
Water Beech ( <i>Platanus occidentalis</i> ) .....	120	Willow ( <i>Salix lasiandra</i> ) .....	167
Water Elm .....	123	Willow ( <i>Salix lasioplepis</i> ) .....	171
Water Hickory .....	186	Willow, Black ( <i>Salix flavescens</i> , var. <i>Scouleriana</i> ) .....	170
Water Locust .....	60	Willow, Black ( <i>Salix nigra</i> ) .....	166
Water Maple .....	50	Willow, Desert .....	116
Water Oak ( <i>Quercus aquatica</i> ) .....	152	Willow, Diamond .....	170
Water Oak ( <i>Quercus palustris</i> ) .....	152	Willow, Glaucous .....	109
Water White Oak .....	140	Willow Oak .....	154
Wax Myrtle .....	186	Willow Oak, Upland .....	153
Weeping Oak .....	188	Willow, Sand-bar .....	168
<i>Wellingtonia Californica</i> .....	184	Willow, Silky .....	171
<i>Wellingtonia gigantea</i> .....	184	Winged Elm .....	124
Western Catalpa .....	115	<i>Wintera Canella</i> .....	24
West-Indian Birch .....	33	Witch Hazel .....	85
Weymouth Pine .....	187		
Whistlewood .....	46	<b>X.</b>	
White Ash .....	107	<i>Xanthoxylum Americanum</i> .....	29
White Basswood .....	28	<i>Xanthoxylum aromaticum</i> .....	30
White Bay .....	20	<i>Xanthoxylum Caribæum</i> .....	30
White Birch ( <i>Betula alba</i> , var. <i>populifolia</i> ) .....	159	<i>Xanthoxylum Carolinianum</i> .....	30
White Birch ( <i>Betula papyrifera</i> ) .....	160	<i>Xanthoxylum Catesbianum</i> .....	30
White Buttonwood .....	87	<i>Xanthoxylum Clava-Herculis</i> .....	30
White Cedar ( <i>Chamaecyparis Lawsoniana</i> ) .....	179	<i>Xanthoxylum Clava-Herculis</i> ( <i>Xanthoxylum Americanum</i> ) .....	29
White Cedar ( <i>Chamaecyparis spheroides</i> ) .....	178	<i>Xanthoxylum Clava-Herculis</i> ( <i>Xanthoxylum Caribæum</i> ) .....	30
White Cedar ( <i>Libocedrus decurrens</i> ) .....	17	<i>Xanthoxylum Clava-Herculis</i> , var. .....	30
White Cedar ( <i>Thuja occidentalis</i> ) .....	176	<i>Xanthoxylum Clava-Herculis</i> , var. <i>fruticosum</i> .....	30
White Cottonwood .....	175	<i>Xanthoxylum Floridanum</i> .....	30
White Cypress .....	184	<i>Xanthoxylum fraxineum</i> .....	29
White Elm ( <i>Ulmus Americana</i> ) .....	123	<i>Xanthoxylum fraziniifolium</i> ( <i>Xanthoxylum Americanum</i> ) .....	29
White Elm ( <i>Ulmus racemosa</i> ) .....	123	<i>Xanthoxylum fraziniifolium</i> ( <i>Xanthoxylum Clava-Herculis</i> ) .....	30
White Fir ( <i>Abies concolor</i> ) .....	213	<i>Xanthoxylum hirsutum</i> .....	30
White Fir ( <i>Abies grandis</i> ) .....	212	<i>Xanthoxylum lanceolatum</i> .....	30
White Ironwood .....	45	<i>Xanthoxylum macrophyllum</i> .....	30
White Laurel .....	20	<i>Xanthoxylum mite</i> .....	29
White Mangrove .....	87	<i>Xanthoxylum Pterota</i> .....	31
White Maple .....	40	<i>Xanthoxylum ramiflorum</i> .....	20
White Oak ( <i>Quercus alba</i> ) .....	137	<i>Xanthoxylum tricarpum</i> ( <i>Xanthoxylum Americanum</i> ) .....	29
White Oak ( <i>Quercus Garryana</i> ) .....	138	<i>Xanthoxylum tricarpum</i> ( <i>Xanthoxylum Clava-Herculis</i> ) .....	30
White Oak ( <i>Quercus grisea</i> ) .....	144	<i>Ximenia Americana</i> .....	34
White Oak ( <i>Quercus lobata</i> ) .....	138	<i>Ximenia montana</i> .....	34
White Oak ( <i>Quercus oblongifolia</i> ) .....	144	<i>Ximenia multiflora</i> .....	34
White Oak, Mountain .....	143		
White Oak, Swamp .....	141	<b>Y.</b>	
White Oak, Water .....	140	Yaupon .....	36
White Pine ( <i>Pinus flexilis</i> ) .....	188	Yellow Ash .....	57
White Pine ( <i>Pinus glabra</i> ) .....	201	Yellow-bark Oak .....	149
White Pine ( <i>Pinus monticola</i> ) .....	187	Yellow Birch .....	161
White Pine ( <i>Pinus reflexa</i> ) .....	189	Yellow Cypress .....	178
White Pine ( <i>Pinus Strobus</i> ) .....	187	Yellow Fir .....	209
White Spruce ( <i>Picea alba</i> ) .....	204	Yellow Haw .....	83
White Spruce ( <i>Picea Engelmanni</i> ) .....	205	Yellow Locust .....	55
White Spruce ( <i>Picea pungens</i> ) .....	205	Yellow Oak ( <i>Quercus prinoides</i> ) .....	143
White Stopper .....	89	Yellow Oak ( <i>Quercus tinctoria</i> ) .....	149
White Thorn .....	78	Yellow Pine ( <i>Pinus Arizona</i> ) .....	192
White Walnut .....	130	Yellow Pine ( <i>Pinus mitis</i> ) .....	200
White-heart Hickory .....	134	Yellow Pine ( <i>Pinus palustris</i> ) .....	202
Whitewood ( <i>Canella alba</i> ) .....	24	Yellow Pine ( <i>Pinus ponderosa</i> ) .....	193
Whitewood ( <i>Drypetes crocea</i> ) .....	121	Yellow Poplar .....	22
Whitewood ( <i>Liriodendron Tulipifera</i> ) .....	22	Yellowwood ( <i>Cladrastis tinctoria</i> ) .....	57
Wild Black Cherry .....	68	Yellowwood ( <i>Schæfferia frutescens</i> ) .....	39
Wild Cherry ( <i>Prunus Capuli</i> ) .....	69	Yew ( <i>Taxus brevifolia</i> ) .....	185
Wild Cherry ( <i>Prunus demissa</i> ) .....	69	Yew ( <i>Taxus Florida</i> ) .....	186
Wild China .....	44	Yopon .....	36
Wild Cinnamon .....	24	<i>Yucca angustifolia</i> , var. <i>elata</i> .....	210
Wild Dilly .....	103	<i>Yucca angustifolia</i> , var. <i>radiosa</i> .....	219
Wild Fig .....	127	<i>Yucca baccata</i> .....	210
Wild Lime ( <i>Xanthoxylum Pterota</i> ) .....	31	<i>Yucca brevifolia</i> .....	218
Wild Lime ( <i>Ximenia Americana</i> ) .....	34	<i>Yucca canaliculata</i> .....	218
Wild Orange ( <i>Prunus Caroliniana</i> ) .....	70	<i>Yucca Draconis</i> , ? var. <i>arborescens</i> .....	218
Wild Orange ( <i>Xanthoxylum Clava-Herculis</i> ) .....	30	<i>Yucca elata</i> .....	210
Wild Peach .....	70	<i>Yucca flamentosa</i> ? .....	219
Wild Plum .....	65	<i>Yucca Treouliana</i> .....	218
Wild Red Cherry .....	66		
Wild Tamarind .....	64	<b>Z.</b>	
		<i>Zizyphus Dominigensis</i> .....	41
		<i>Zizyphus emarginatus</i> .....	39
		ZYGOPHYLLACEÆ .....	28, 29