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T. heterophylla Sargent. *Abies heterophylla* Raf. *Tsuga Mertensiana* f. *authens* not of Carr. A very large tree 100-200 feet high and 2-6 feet in diameter, with rough rather thick bark: ultimate branchlets very slender, roughish and when young long-hairy: leaves linear, 4-9 lines long, abruptly petioled, entire or usually spinulose-serrate toward the rounded apex, shining above, when young with 2 white stripes beneath: staminate flowers 2-3 lines in diameter, shorter than the stipe: cones oblong-cylindrical, acute, 4-9 lines long, slightly pubescent: scales longer than wide: bracts truncate: seeds about 1 line long, the wing twice as long: cotyledons 2 or 4. In moist places in forests, California to Alaska.

T. Mertensiana Carr. (Conf. ed. 2, 25). *T. Pattoniana* Engelm. A large tree 100-200 feet high and 1-4 feet in diameter, with rough dark brown bark, slender pubescent branchlets and dark green foliage: leaves 6-12 lines long, angular, acutish, attenuate at the base, often curved, stomatose and keeled both sides, unequal and appearing as if in fascicles: staminate flowers about 2 lines thick, on a very slender stipe: cones cylindrical-oblong 2-3 inches long, 6-8 lines in diameter: seeds $2\frac{1}{2}$ lines long, with an obliquely obovate wing about 4 lines long. On the high mountains California to Alaska.

10 PICEA Link Abh. Akad. Wiss. Berlin 1727, 179.

Large evergreen trees with reddish flaky bark and spreading branches. Leaves keeled above and beneath, more or less quadrangular, articulated on a prominent, at last ligneous, persistent rhombic base, spirally arranged all around the branchlets, sometimes by a twist of the base somewhat 2-ranked: resin-ducts irregular. Staminate flowers axillary and terminal on the previous year's branchlets, with an oblong or cylindrical staminal column, its short stipe surrounded by numerous bud-scales: the commissure of the anthers expanding into a broad nearly circular erect crest: anther-cells opening longitudinally. Pistillate anthers large, with 2 air-sacs. Pistillate anthers borne at the ends of short or longer branchlets, the scales much longer than the bracts. Cones maturing the first year, pendulous: scales and enclosed bracts persistent upon the axis. Seeds without resin-vesicles, imbedded in the membranous base of the wing which lays its under side nearly free and permits it to fall out. Cotyledons 4-8.

P. Breweriana Watson Proc. Am. Acad. xx. 378. A slender tree 100-150 feet high and 2-4 feet in diameter, with spreading or ascending branches and puberulent pendent branchlets, these sometimes 6-8 feet long and not more than 4 lines in diameter: leaves 5-12 lines long, strictly sessile upon the slender base, obtuse, smooth and rounded or slightly carinate above, stomatose beneath on each side of the slightly prominent midnerve: cones 2-4 inches long, 8-10 lines in diameter, narrowly cylindrical, attenuate at base: bracts linear-oblong, 2 lines long: scales thick, puberulent, obovate, with slightly thickened rounded summit, entire, 6-8 lines long: seeds $1\frac{1}{2}$ lines long, the wing 4 lines long, $2\frac{1}{2}$ lines wide. On dry rocky ridges in the Siskiyou and Coast Mountains of southern Oregon and adjacent California.

P. Engelmanni Engelm. Trans. St. Louis Acad. ii. 2 2 A tree 100-150 feet high and 2-5 feet in diameter with cinnamon colored bark and spreading branches with pubescent branchlets: leaves soft and flexible, standing out in all directions from all sides of the branchlets, tetragonal, acute, with callus