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*Let's
Know
Some
Trees*

UNITED STATES DEPARTMENT OF AGRICULTURE
MISCELLANEOUS CIRCULAR NO. 31

rev. Dec. 1931

FOREWORD

Sometime ago the editor of one of the larger of the country papers of California wrote: "If you or some one else in the Forest Service would only write up simple descriptions of our California trees, in such language that the plain man could understand them, I believe every country paper—and some city ones—would be glad to print them."

That recalls an incident of years ago. As a train waited on a siding in the Coast Range two boys who were gazing delightedly out upon giant Redwoods asked their father: "Dad, what kind of trees are they?"

The father glanced up from his newspaper and said: "Pines, I guess."

So the lads called them pines until a brakeman, hearing them, grunted: "Them's redwoods."

Misinformation is even worse than ignorance. It is hoped that our traveling friends who visit California, as well as the residents throughout the State, will find this booklet helpful in giving them reliable information about some of California's principal trees.

CHARLES H. SHINN.

Charles Howard Shinn, former forest supervisor of the Sierra National Forest and the author of this publication, died in 1924. He was one of the pioneer foresters of California and served for more than 20 years as an officer of the California Region, United States Forest Service. Let's Know Some Trees, written in Mr. Shinn's unique style for those who wish to know something of the trees of California, has filled a large place in the forest literature of the State.

Washington, D. C.

Issued January, 1925
Revised December, 1931

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LET'S KNOW SOME TREES

Brief Descriptions of the Principal California Trees

By CHARLES H. SHINN, *formerly Forest Supervisor, Sierra National Forest, California Region, Forest Service*

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THE PINES

First of the cone bearers, we name the tree John Muir so loved—the **sugar pine**, finest of all the pines in the world. (Fig. 1.) It often grows to be 200 feet high, with a trunk from 4 to 8 feet through. The bark is reddish brown in color; the leaves (needles) are blue green, five in a bundle, sharp-pointed, and about 3½ inches long. The beautiful cones are from 12 to 22 inches long, clear light brown when dry, and hang in bunches from the tips of the branches. Sugar pine is found from southern Oregon to Lower California. In the Sierra Nevada of California it reaches its best development from 5,000 to 6,000 feet above the sea.

The **western yellow pine** (fig. 2) is found in all the States west of the Great Plains, and also in British Columbia and northern Mexico. In the Sierra it grows often with the sugar pine, from which it is easily distinguished by its longer, coarser, yellow-green needles (4 to 11 inches) occurring in bunches of three. The cones are only 3 or 4 inches long as a rule, reddish brown when dry, and set in a mass of needles at the ends of the branches. The bark on old trees forms large, irregular, yellowish plates.

A species closely related to the western yellow pine is called **Jeffrey pine**. It is a somewhat smaller tree, although its cones are much larger. Its reddish, occasionally almost black bark, is broken into narrow plates. The needles occur, like those of western yellow pine, in bunches of three. Although occasionally found by itself—

in what is called a "pure stand"—it is usually associated with western yellow pine and the firs.

Coulter pine, often called "the bigcone," is common in the mountains of southern and Lower California. Its leaves (needles) are

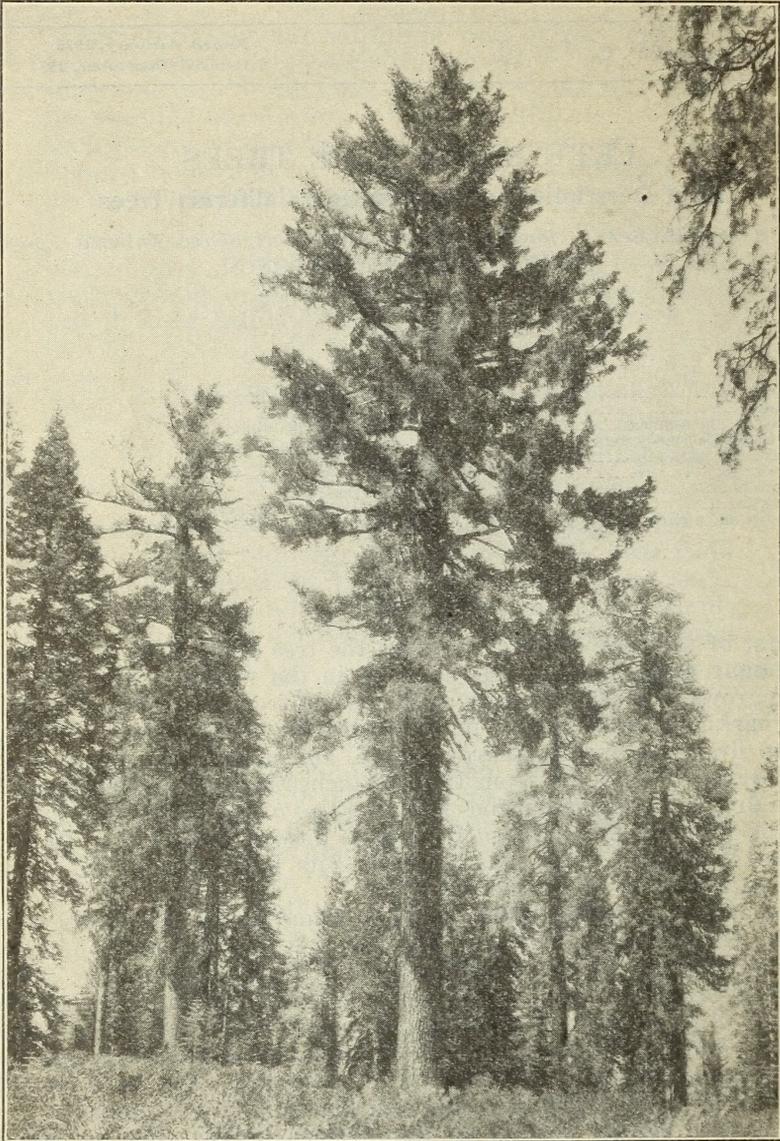


FIGURE 1.—Sugar pine (*Pinus lambertiana*)

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also three in a cluster and average 9 inches in length, but are stiffer and heavier than those of western yellow pine, as are also the branches and twigs. But the great distinguishing feature is the

cone, which is 9 to 14 inches long, very thick and heavy, and armed with sharp hooks.

Digger pine is found in the dry, hot foothills. The bark is a dull gray-brown, and the leaves, in sets of three, are 8 to 12 inches long,



FIGURE 2.—Western yellow pine (*Pinus ponderosa*)

F236862

gray green in color, and sparse. The foliage is so open that you can fairly see through a digger pine, while that of a western yellow pine almost obstructs the view. The cones of the digger pine lie close against the trunk or larger branches and often stay on the tree for

years. While not so heavy as those of Coulter pine, the cones are of the same type and are much heavier and harder to handle than those of western yellow or Jeffrey pines or those of sugar pine, which, though long, are light and without barbs.

The **Monterey pine** (fig. 3), often 90 to 100 feet in height in sheltered locations, is only 60 to 80 feet high near the coast, dwindling to a distorted, flat-topped dwarf on the rocky points.

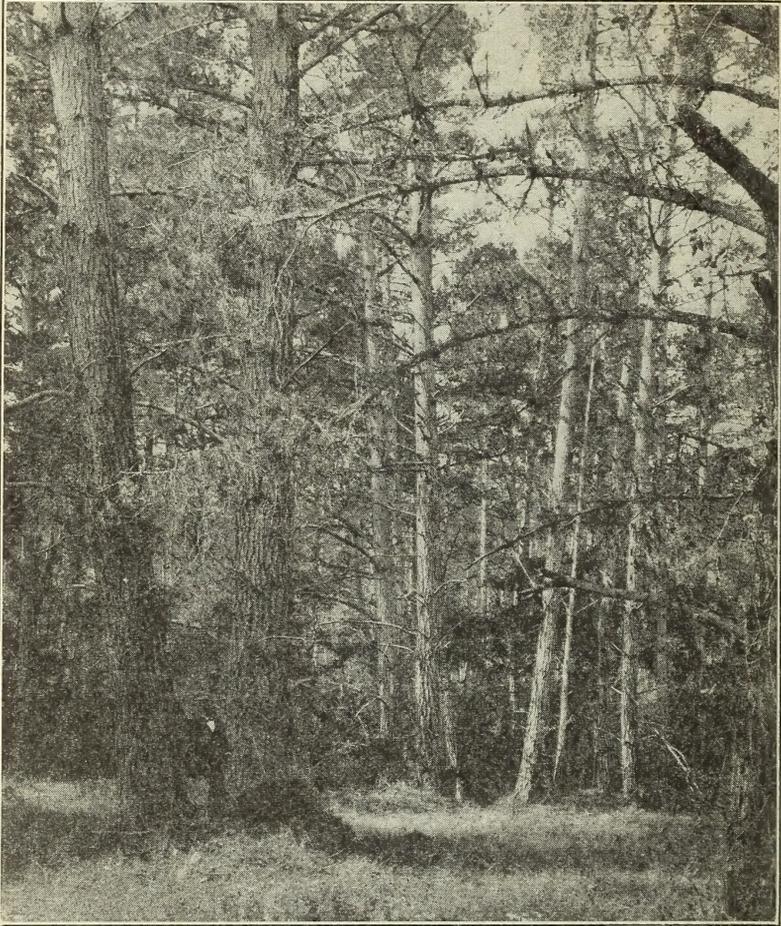


FIGURE 3.—Monterey pine (*Pinus radiata*)

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The needles are 3 to 4 inches long, usually in bunches of three; the bark is dark and ridgy, and the closed cones hang for years on the tree. This tree is easily transplanted and grows readily from seed, and hence is used to hold drifting sands. Although of no timber value in California at present, it has been largely planted in Australia for box lumber.

The Indians often break the nuts and eat the seed of digger pine of the foothills, and they prize the nuts of sugar pine that "float"

out of the opening cones from high up on the trees and are hard to locate when they reach the ground. But it is the seeds of the **single-leaf piñon** or **pine** of dry desert slopes, mainly on the east side of the Sierra, that are sold in fruit stores as "piñon nuts." (Fig. 4.) These are gathered in quantity by piling the cones, when they are mature but still closed, in great stacks and opening them by a slow fire. The tree is only 15 to 20 feet high and has dark brown bark and light green needles. This is the only American pine whose needles typically grow singly, not in bundles. These needles are plentiful, however, and the low trees or bushes are thickset and solid.

Another food pine, the **Parry piñon**, a species whose needles usually grow in bundles of 4 but may vary from 2 to 5, is often



FIGURE 4.—Singleleaf piñon pine (*Pinus monophylla*)

F236916

hardly more than a large bush of the desert slopes in southern and Lower California. The bark is reddish brown, the nuts very good to eat, but the tree is too scarce to count for much.

A high desert pine, the **bristlecone**, is an irregular, bushy tree with a short, thick trunk. Its very short needles are usually in fives. The cones, about 3 inches long and dark reddish brown when ripe, have scales tipped with sharp, slender, curving prickles.

A rather rare species is the **limber pine**, found only at high elevations. The bark of the young branches is very light, while that of the main stem is dark brown. The needles, in bundles of five, grow in close masses and are from 1½ to 3 inches long on the flexible, trailing branches. The green twigs are so limber that they can almost be tied into knots without breaking. These trees may be found on Mono Pass. The cones, from 4 to 10 inches long, take two years to mature—as is the case with most pines—and by early winter of their second year have fallen from the tree.

The **foxtail pine**, or Balfour pine (fig. 5), grows at or near timber line, occurring in small, isolated groups, mainly in the Sierra. The

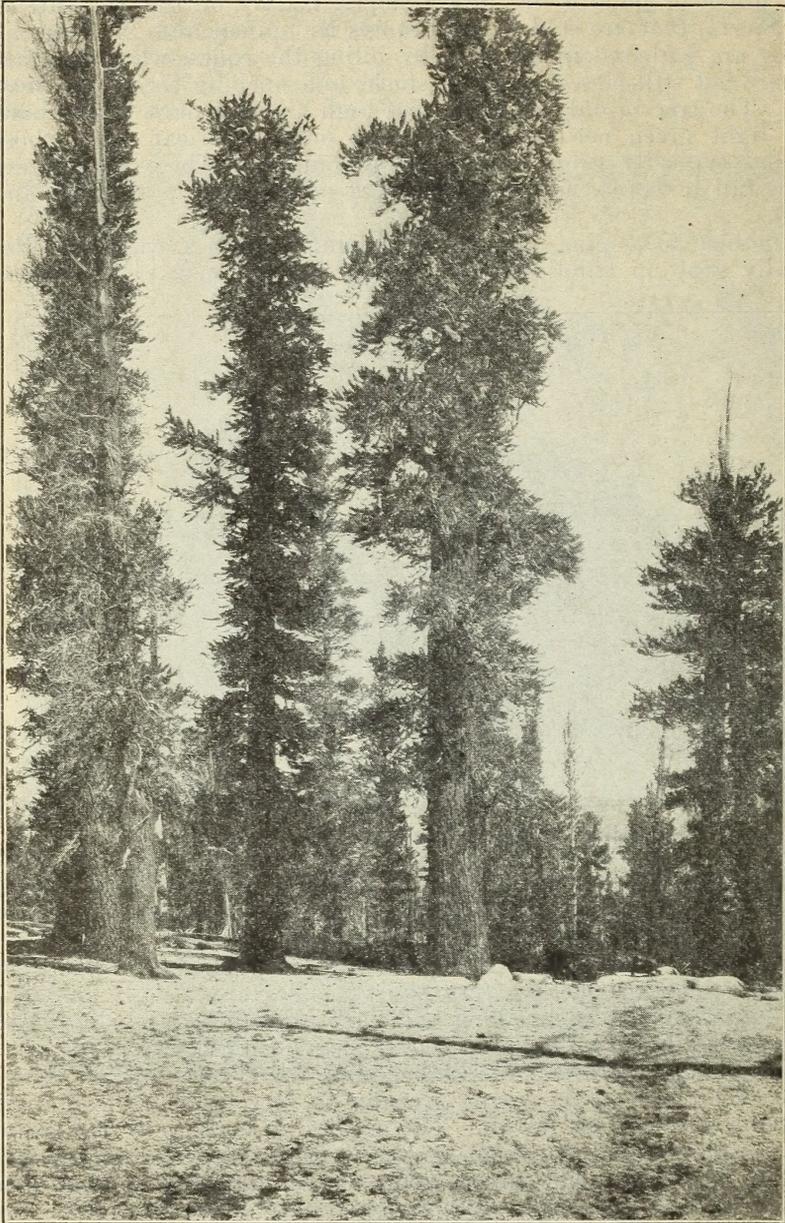


FIGURE 5.—Foxtail pine (*Pinus balfouriana*)

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needles occur in bundles of five and are massed in "foxtails" near the ends of the branches.

A very beautiful tree is the **western white pine**, sometimes called "silver pine," "mountain white pine," or "little sugar pine," which grows above the true sugar pine belt. Its grayish bark is only about an inch thick; its needles, in bundles of five, are blunter pointed than those of sugar pine and its cones suggest miniature sugar pine cones but have sharp-pointed seed wings, the seed wings of sugar pine being rounded.

The so-called "tamarack" of the California mountains, properly named **lodgepole pine**, sometimes forms rather large forests, as it once did on the mountain ridges between Lakes Tahoe and Carson, but most often straggles along the edges of mountain meadows. The needles are in twos; the bark is gray or brownish, somewhat soft, and full of resin. Woe to the thoughtless boy who cuts his initials in that temptingly soft bark. In a short time the incision is dripping pitch, which will get on his hands and clothes, on those of his fellow campers, and of anyone who follows his party. The cones are seldom over 2 inches long. The tree is at its best from 6,000 to 8,000 feet above sea level.

The bushy little alpine pine known as **whitebark pine** or "dwarf pine," which interests all who cross the high Sierra passes, has thin, silvery bark at first smooth and later fissured and checked, leaves in clusters of five, and cones a deep purple when growing on the tree, brown when dry, and from 1½ to 3 inches long. While the trees are truly dwarfed into shapeless shrubs on the highest elevations where they occur, in more sheltered spots of deep, rich soil they have been found 50 feet high and almost 2 feet in diameter.

The **knobcone pine** or "scrub pine," is a small tree 20 to 40 feet in height, and seldom as much as 18 inches through. In slightly different forms it occurs in both the Coast Range and the Sierra. The needles are in threes and are light green; the cones, in clusters around the stem, remain indefinitely on the tree with the prickly scales closed.

The **Torrey pine** (fig. 6), found near the sea only in San Diego County and on Santa Rosa Island, is the rarest of California pines. Bent by sea winds, it is a crooked, sprawling tree 20 to 30 feet in height, and from 8 to 14 inches through. Occasionally, away from the sea winds and in protected hill coves, it has a straight trunk from 50 to 60 feet in height. The species is anomalous among yellow pines because its stout, gray-green needles, 7 to 12 inches or more in length, are in clusters of five. The russet or chocolate-brown strongly attached cones, about the size of a coconut, bear large edible seeds.

The **Bishop**, or **pricklecone pine**, is a hardy, little-known species found in widely separated areas along the coast from Mendocino County south to San Luis Obispo County. It sometimes reaches a height of 60 feet or over and a diameter of from 12 to 20 inches. It is a bushy tree with a dense pyramidal crown, deep-green foliage and leaves 3½ to 4 inches long, two to a bundle. Its bark is rough, deeply furrowed, purplish brown in color and its cones are indefinitely persistent.

FIGURE 6.—Torrey pine (*Pinus torreyana*)

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The elevations at which the various pines grow are about as follows:

Bishop.....	0 to 1,000 feet
Bristlecone.....	7,000 to 11,000 feet
Coulter.....	2,500 to 6,000 feet
Digger.....	1,000 to 3,000 feet
Foxtail.....	5,000 to 11,500 feet
Jeffrey.....	6,000 to 8,000 feet
Knobcone.....	1,500 to 3,000 feet
Limber.....	8,000 to 12,000 feet
Lodgepole.....	4,000 to 11,000 feet
Monterey.....	At or within a few hundred feet of sea level
Parry.....	4,000 to 8,000 feet
Singleleaf.....	2,500 to 9,000 feet
Sugar.....	4,000 to 7,000 feet
Torrey.....	Sea level to about 100 feet
Western white.....	5,500 to 9,000 feet
Western yellow.....	2,500 to 7,000 feet
Whitebark.....	7,000 to 11,000 feet

FIRS, CEDARS, AND SEQUOIAS

THE FIRS

The **white fir** (fig. 7), mainly of the western slopes of the Sierras and the Cascades, is a beautiful tree, occasionally 200 feet high and



FIGURE 7.—White fir (*Abies concolor*)

F12497

4 to 5 feet in diameter. The old bark is dark ashy gray, and the leaves are 1 or 2 inches long, in flat rows and fragrant. The cones, standing upright on the upper branches, are 3 or 4 inches long and

fall to pieces when they are mature, while still on the tree. The branches of young white fir grow in whorls, and the bark is grayish with a brownish tinge. Young white fir is one of the most desirable Christmas trees.

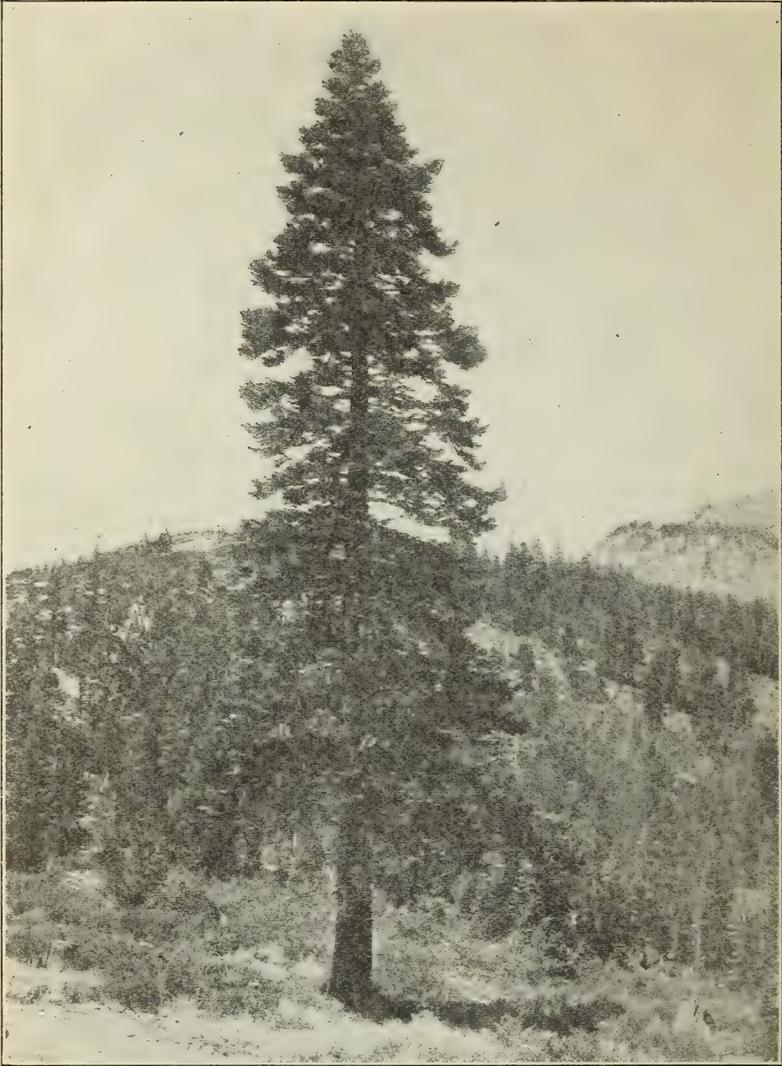


FIGURE 8.—California red fir (*Abies magnifica*)

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The **California red fir** (fig. 8) resembles the white fir but occurs at higher elevations. Its furrowed bark, in zigzag ridges, is dark red brown. The mature leaves are deep green, while the new foliage is silvery. The upright cones are 5 or 6 inches high and, like those of white fir, fall to pieces on the tree when ripe. The 4-angled

leaves are longer and flatter on the lower branches, but shorter, closer set, and more silvery on the young high branches.

The **bristlecone fir** is one of the rarest of California's true firs. Scattered patches of it grow mainly in Monterey County at the heads of canyons on the seaward slopes of the Santa Lucia Mountains. The sharply pointed, spirelike crowns are so distinctive that the trees can be recognized among its associates several miles away. So also its long, flat, keenly pointed, lustrous leaves and its egg-shaped cones bristling with slender needlelike bracts are ready means of distinguishing this beautiful fir.



FIGURE 9.—Douglas fir (*Pseudotsuga taxifolia*)

F47869

The **Douglas fir** (fig. 9), the most valuable timber tree of Washington and Oregon (the "Oregon pine" of commerce), occurs in small groups or mingled with other species in the California mountains, as does the closely allied bigcone spruce. The bark is thick, furrowed, and smoky brown, and is used to some extent in tanning. The leaves are flat and slightly grooved and are usually deep yellow green, although in exposed dry areas (especially in the Rocky Mountains) they are often bluish. All of the limbs have long, drooping branchlets. The cones, 2 to 2½ inches long, have prominent, projecting, 3-pointed bracts, which are of great assistance in identification.

THE CEDARS

Incense cedar (fig. 10) is a beautiful and fragrant-foliaged tree common in both the Coast Range and Sierra. The cinnamon-brown bark can be pulled off in long strips and has even been used for

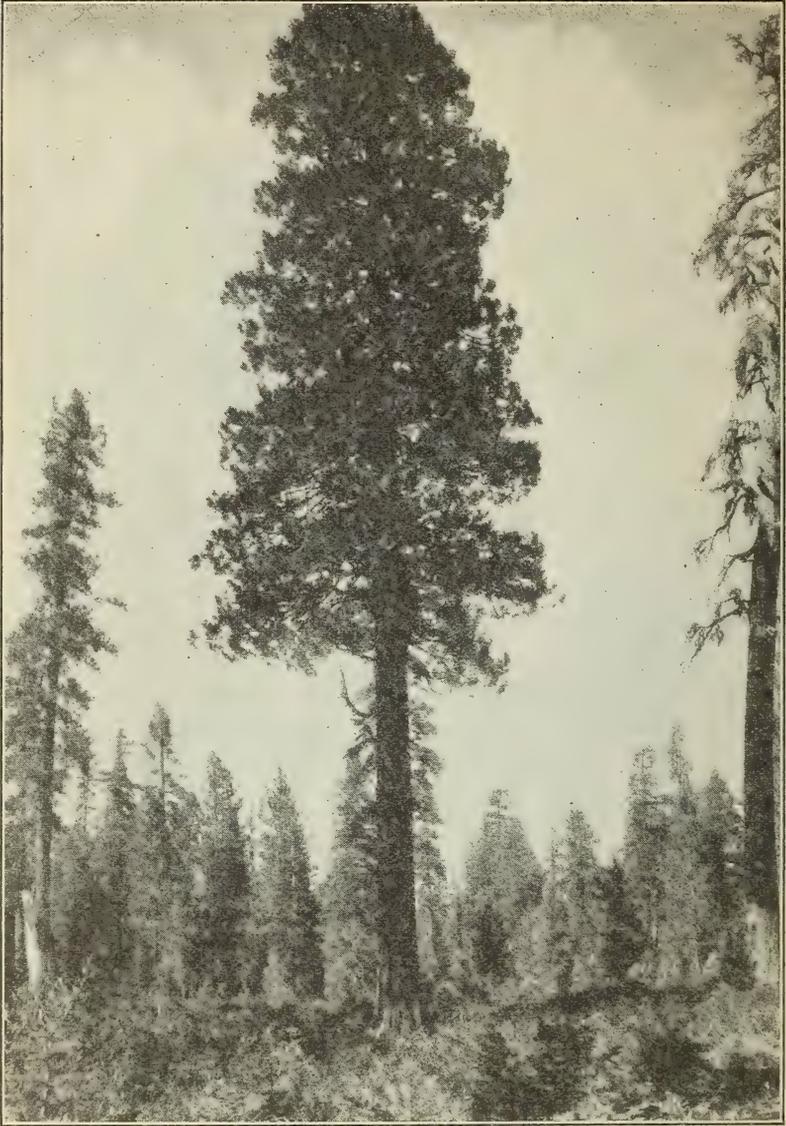


FIGURE 10.—Incense cedar (*Libocedrus decurrens*)

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roofing cabins. The small, scalelike leaves lie with their twigs in flat sprays. The unique, spindlelike cones, about an inch long, are composed of three pairs of scales, the lowest pair very small and the

uppermost pair united; and they bear four little seeds apiece, two on each side of the flat central partition. The timber is very durable when it can be found free of dry rot, which is its greatest disease enemy.

The **western red cedar** is found in the foggy Northwest coast valleys. Its foliage is very much like that of the true cypresses, and its wood is resistant to decay, making it valuable for posts.

THE SEQUOIAS

The **Sequoias**, among the rarest and most noted of all trees, the survivors of a former geologic age, were once widely distributed over the world, but now are represented by only two species, the bigtree and the redwood.

The **bigtree** or sequoia of the Sierra Nevada (fig. 11), known as "the oldest living thing," sometimes attains the age of over 3,000 years. The tallest bigtrees are 250 to 300 feet high and their diameters at the base vary from 20 to 35 feet. The soft red-brown or tan-colored bark is often 2 feet thick. The foliage is blue green in color and the leaves are small and awl-shaped and overlap each other covering the slender drooping sprays. The beautiful cones, which are matured the second year, are only about 2 inches long and absurdly small for those great columnar trunks to bring forth; the tiny seeds are thin and flat. The bigtree is found growing in the Sierra at elevations varying from 3,000 to 8,000 feet in 62 separated groves scattered along a belt 250 miles long extending from the Forest Hill Divide in Placer County to Deer Creek in Tulare County. Several books have been written about the bigtrees. Among these are *Big Trees*, by Walter Fry and John R. White, and *the Giant Sequoia*, by Rodney Ellsworth.

The **redwood** (fig. 12) sometimes grows to a height even greater than the bigtree but is not so large in diameter, nor does it attain so great an age. The tallest specimen now known, 364 feet in height, is in the Bull Creek grove of the Humboldt State Redwood Park. Ring counts on the largest trees indicate an age of over 1,400 years. The cones of the redwood, maturing within the year, are even smaller than those of the bigtree, being only about an inch long, and the seed is similar. The color of the foliage is olive green, with flat, sharp-pointed leaves, from one-third to 1 inch in length, on slender branches.

The redwood is found in an almost uninterrupted belt 450 miles long on the seaward side of the Coast Range from southern Oregon to the Santa Lucia Mountains in Monterey County, Calif. It never grows naturally out of reach of the ocean fogs, and the greatest distance it extends inland is 30 miles.

OTHER CALIFORNIA CONE BEARERS

A small and useful tree of the high ranges, the **western or Sierra juniper**, is exceedingly long-lived and yields fragrant, cedarlike wood. Its small, blue-black berries are technically "cones"; the brown-red bark is soft and fibrous. The junipers are usually small bushy trees growing in high places and desert borders. Four different species occur in California.



FIGURE 11.—Bigtree (*Sequoia washingtoniana*)

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Casual observation might confuse **California juniper** with western juniper and the wood of the two trees can hardly be distinguished. However, the fact that California juniper is a tree of the lower



FIGURE 12.—Redwood (*Sequoia sempervirens*)

F239334

ranges serves to distinguish it roughly from its more ambitious neighbor. As a forest tree, California juniper is specially noticeable for its ability to thrive on low, desert slopes and plains, where it keeps company with yuccas, piñon, and Sabine pines. It is not

believed to be quite so long-lived as western juniper. The berries also show another point of difference, those of the California juniper being light red-brown, rather than the bluish-black, white-coated fruit of the other species, and with a loose, thin, and papery skin very unlike the tough, thick covering of western juniper cones.

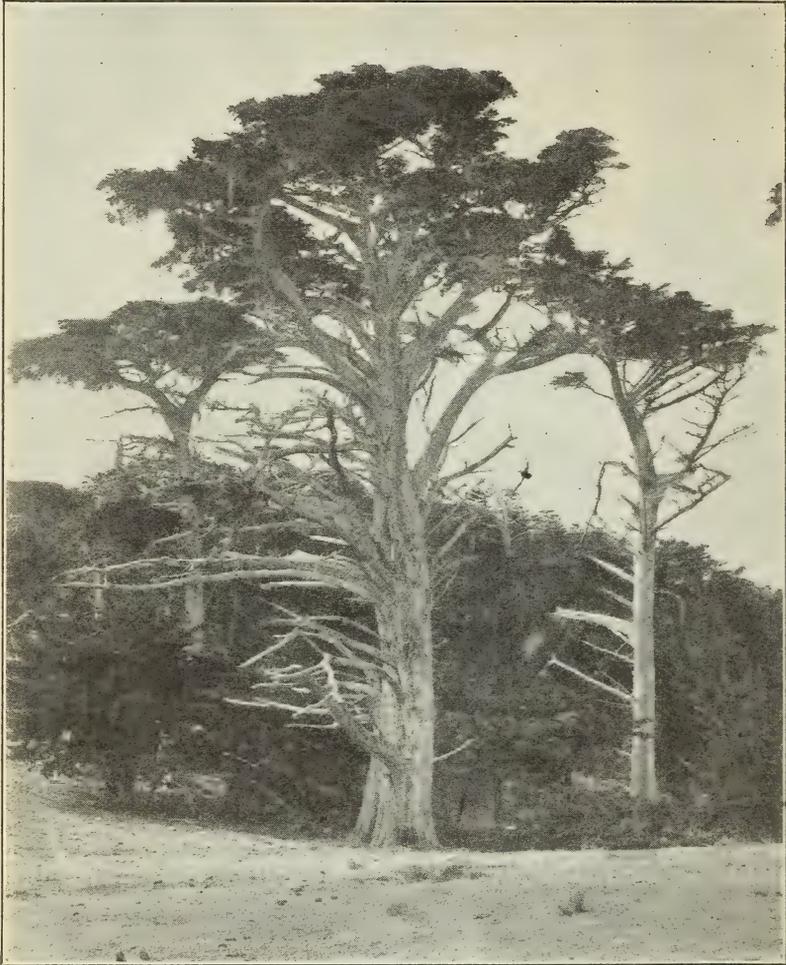


FIGURE 13.—Monterey cypress (*Cupressus macrocarpa*)

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Other conifers occur in California in comparatively limited areas. There is the **Monterey cypress** (fig. 13), for instance, with its gnarled and twisted, moss-hung grotesqueries; the **Gowen cypress**, a finer foliaged but smaller tree which grows along the coast in scattered locations from Mendocino County to San Diego (it includes the **dwarf** or **pygmy cypress**, found only on the coast barrens of Mendocino County); and the **Macnab cypress**, found in Shasta County and the Siskiyou and south to Napa County, in isolated groups. To most of us there is little difference between these

cypresses except in size. The round cones in rows or groups along the branchlets mark them as cypresses, as does the foliage, with which we are all familiar in windbreaks and garden hedges.

The **Port Orford cedar** (Lawson cypress) is one of the most beautiful evergreen trees to be found in the State. In California it is confined almost entirely to Humboldt County, although it occurs occasionally as far inland as the west base of Mount Shasta. The tiny leaves of its peculiarly flat branchlets are soft to the touch as compared with the leaves of the true cypresses. The tree is from 125 to 180 feet high, $3\frac{1}{2}$ to 6 feet through; its quality as timber is excellent, but it occurs in such limited areas and in such small groups that it is not a large factor in the lumber business of the State.

Then there are the spruces: The glorious **Sitka spruce** in low valleys facing the ocean, from the northwest borders of the State as far south as Mendocino, and the **weeping spruce** at higher elevations in the Siskiyou. These are both in a manner spilled over from Oregon, where they are at their best. We have the so-called **big-cone spruce**, too, from eastern Santa Barbara County south to the limits of the State. This was long considered a variety of the Douglas fir, which it much resembles except for its larger cones. Bigcone spruce is not a true spruce. It belongs to the genus of false hemlocks because of a resemblance in the formation of leaf stems and in the characteristics of the cones. Bigcone spruce is of value principally as "protective cover" for watersheds.

The **western hemlock** from the North Pacific States, a large forest tree, is found in the coastal fog belt of California as far south as Marin County, and extending inland for 20 miles up to an elevation of 2,000 feet on the ocean side of the range. Its foliage is a glossy yellow green with small leaves not over an inch long, and the bark on the old trees is dark russet brown, deeply furrowed with narrow cross ridges.

The rare **mountain hemlock** (fig. 14), when small, looks like the cedar or Himalaya cedar, so often planted in parks. The leaves grow in close tufts, and the oval cones, 1 to 2 inches long, have an exquisite purple bloom when young.

The **Pacific yew**, with its small, deep, yellow-green leaves resembling a redwood, is occasionally found near streams in deep moist ravines and gulches in the Coast Range from Humboldt County as far south as Lake County and on the western slopes of the Sierra from Lassen to Tulare Counties. It is a small tree, usually not over 30 feet high, with a thin papery bark, and bright coral-red fruit that ripens in the fall.

Nor must we forget our **California nutmeg**, that strange tree with the flat, shining, sharply pointed leaves whose keen odor has won it the name of "stinking cedar." Its seed kernel suggests the nutmeg of commerce, but the botanical affinities of our California tree are with yews and conifers rather than with magnolias and laurels, as is the case with the East Indian nutmeg. The trunk, usually twisted or crooked, occasionally reaches a height of 80 feet, but is more often from 35 to 50 feet in height. The rather soft bark, with its finely checked seams, is green on the younger branches, but becomes yellowish as it gets old. Though found both on the west slopes of the

Sierra and in the Coast Range, from Lake County to Kern, it is in such small scattered groups that it is not of commercial value.

Several books suitable for studying the cone bearers of California have been issued, including *Trees of California*, by Willis L. Jepson, and *Western Forest Trees*, by James B. Berry. Especially useful



FIGURE 14.—Mountain hemlock (*Tsuga mertensiana*)

F200630

for those not trained in botany is *Forest Trees of the Pacific Slope*, by the late George B. Sudworth, of the Forest Service, which can be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C., at 60 cents a copy. This is fully illustrated and should be in every school and part of the outfit of every automobile that goes into the mountains.

THE OAKS

The oaks of California are divided roughly into white and black, according to the color of their trunks; and each of these sections is again divided into live or evergreen oaks and deciduous oaks. One species, the **evergreen black oak**, which is thought to be a hybrid between California black and highland live oaks, suggests a cross between the live and deciduous groups, for it holds its leaves until the swelling buds of spring push them off, leaving the branches bare but a few weeks.

California oaks do not hold high rank in the production of commercial lumber, although occasionally barrel staves, flooring, bridge planks, and even furniture have been manufactured from some of them. As a rule, all the varieties form poor, cross-grained, brittle wood, decaying at the heart before saw-timber size is reached. They have been used principally for firewood and one species (tan oak) for tanbark. But from valley floor up the mountains to 4,000 feet they give the beauty and shade that are dear to every camper. Beyond that elevation they still gleam bright green, or in the fall golden and scarlet, among the darker pines; or form thickets of "scrub" in openings.

DECIDUOUS OAKS

The three most widely scattered and abundant of the deciduous oaks—the three attaining the largest size—are the valley white oak, the California blue oak, and the California black oak. A fourth, the Oregon white, or Garry oak, is abundant in California in the northern coast region.

The **valley white oak** (fig. 15) is the tree of the interior plains and valleys, growing in open stands, in groves, or scattered over miles of level or gently sloping ground, from the headwaters of the Eel River to Los Angeles and Santa Monica. It is found up to 5,000 feet in the watersheds of the Sur and Carmel on the north and west slopes of Tamalpais, and up the first foothills of the Sierra, in some places as high as 3,000 feet. Occasionally a tree 100 feet high is seen, or one with a diameter of 30 to 40 inches—sometimes much more. As a rule, however, 40 to 50 feet is the height and 20 to 30 inches the diameter of a valley oak.

One of the finest specimens is the Sir Joseph Hooker oak near Chico, 150 feet in spread of branches, and with a trunk $6\frac{1}{2}$ feet in diameter. When the late General Bidwell took the celebrated British botanist Sir Joseph Hooker to see this tree, the latter said he thought it was the largest and most beautiful oak he knew of anywhere in the world. Another splendid specimen, 130 feet high, is in the Ojai Valley, and the Henley oak in Round Valley is 150 feet high and over 8 feet in diameter.

The incut leaves vary in size, but are of the sort from which the oak-leaf patterns used in carving, table linen, and embroideries are taken. It is one of the few trees that give us autumn color near San Francisco, and loads of the colored foliage are taken from the San Mateo peninsula to the San Francisco florist shops in the fall. The acorns are bright chestnut in color and slender, have close, scaly

cups, and vary greatly in size. The trunk is ashen gray and is of the white oak type.

The **California blue oak**, appropriately so called because of the bluish tint of its foliage, is another gray-trunked tree. It occurs on the interior slopes of the Coast Range and the west slopes of the

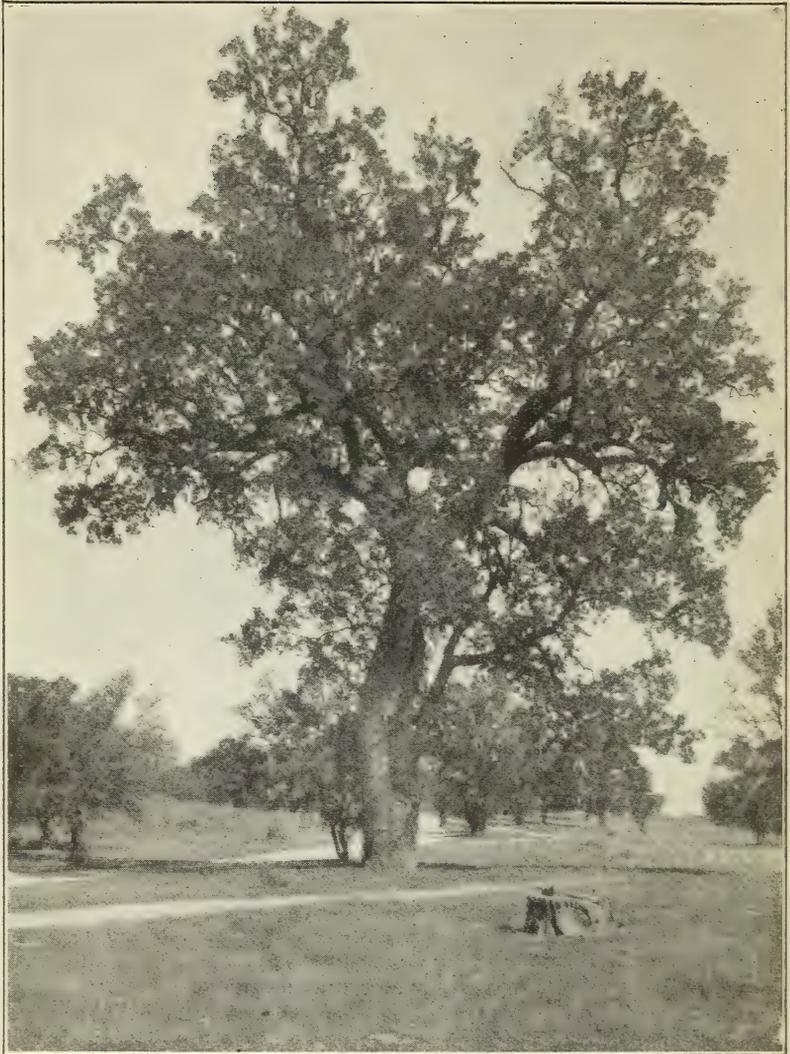


FIGURE 15.—Valley white oak (*Quercus lobata*)

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Sierra, in the same dry, sunny conditions that delight the digger pine. These trees once covered the foothills in open stands for many miles from Mendocino and the mountains south of Shasta clear to the Tehachapi. It is the oak that named Paso Robles and that occurs on the Carriso Plains. For years it furnished the firewood of Stockton, Modesto, Merced, Madera, Fresno, and Tulare, but the easily

accessible supply has now disappeared. The leaves of this oak are wavy at the edges, but are not deeply incut like those of the valley white oak, and the acorns are blunter and thicker in proportion to their length. The tree is seldom over 40 feet high and 20 inches in diameter, although rare specimens have been found with a diameter of 2 feet and a height of 75 feet.

Next in range of altitude, but overlapping the valley white and the California blue oaks, comes the **California black oak**. The hard, deeply furrowed bark of this tree is very dark, seeming black when wet and bare. After the soft pink leaves of the spring mature into the great, shiny, dark yellow-green ones of summer, however, little of the trunk is visible beyond the first few feet above the ground. Except that they have the bristle-tipped lobes characteristic of the black oak group, the leaves of this oak are rather similar in shape to those of the valley white oak, but are longer (4 to 6 inches) and deeper green. The acorns vary in size, are pale chestnut in color, and downy at the top end. The cups are scaly, with the lowest scales much thickened. This oak occurs from central Oregon to the Mexican border, not on the plains or near the sea, but usually from 1,500 feet up to 5,000 or 7,000 feet, where it meets and mingles with western yellow pine and firs. It is at its best in the Sierra at 3,000 feet, where it is the principal oak species, furnishing many Indians with what was once their main dependence for food, and is even yet a favorite item in their diet—acorn-meal mush. It also furnishes firewood for the mountain people and mast for their hogs. California black oak is the principal oak in the Yosemite Valley.

The **Oregon white oak**, the white oak of British Columbia and Washington, the largest and most abundant oak of Oregon and there called "Oregon oak," is perhaps best known here as **Garry oak**. It is commonly 25 to 55 feet high in California and is abundant in the Bald Hills region, inside the redwood belt of Mendocino and Humboldt Counties. It is found rather frequently as far south as the east side of Santa Rosa Valley, and rarely in the Santa Cruz Mountains. The 5 to 7 lobed leaves are large and of a dark, shining green. The trunk bark is white and cut into broad plates by shallow fissures. The shiny acorns of Oregon white oak differ from the acorns of the other large oaks of California. They are almost round (one-fourth to $1\frac{1}{4}$ inches long by two-thirds to 1 inch thick) and bulge out of very shallow cups.

LIVE OAKS

The evergreen or live oaks form a distinct class, in which three or four stand out conspicuously. This indefinite number is used because one of them, the **tan oak**, is not called an oak at all by some botanists, but is classed with the *Pasania*s, of which there are over a hundred species in southern Asia, though only this one grows in California. These *Pasania*s are between intermediate chestnuts and chinquapins and the true oaks; have chestnutlike leaves, and upright catkins like a chestnut instead of the drooping flowers of the oaks. The fruit, however, is plainly an acorn, although the acorn cup is bristly and suggestive of a chestnut bur.

The tan oak is commercially the most useful of our California oaks. It is a smooth-trunked tree with light-green leaves, shiny on top as a

rule but woolly on the underside. While it occurs in the Coast Range from Southern Oregon to Lower California, it is commonest and best in Humboldt, Mendocino, Sonoma, Santa Cruz, and Monterey Counties, where the redwood grows best. There it is cut for its bark, which is of great value to the leather industry. The wood is left on the ground to decay or is hauled off for firewood. Although it is the hardest and most beautiful of our oak woods, really suitable for furniture, it has not been so used except as an experiment.

The **coast live oak**—the oak from which Oakland was named and is the glory of the University of California campus at Berkeley, is a low, broad tree, usually with a trunk 1 to 2 feet in diameter and a height of 50 feet, though occasionally trees 60 to 70 and even 80 feet in height and 3 feet through are found in favorable locations. The largest recorded specimen, over 100 feet high and more than 6 feet through, is in the Ojai Valley.

This oak occurs in the Coast Range from Sonoma County to Lower California. The leaves are similar to holly leaves and when mature curl over, partially hiding the undersurface. The bark on young trees is light, but old trees have the dark, heavily ridged bark we all know. The acorns are slender, and the edges of their scaly cups turn in.

The **evergreen white oak** (often called "mesa" and "Engelmann oak") is found mixed with the coast live oak on the low hills and rolling mesas of southern California and in the Palomar Mountain region. Its deeply furrowed, grayish-brown bark and dense crown resemble those of the eastern white oak. The leaves are thick, bluish green and almost smooth.

The **highland live oak**, when young, is similar to the coast live oak; its smooth leaves, however, do not have a tendency to curl, and are yellowish beneath. It is a vigorous, round-headed tree, 30 to 75 feet high, with a trunk 1 to 3 feet in diameter, and leaves either smooth-edged or spiny-toothed. One finds it on the trails climbing the sides of the Yosemite Valley, where it gives a good excuse for stopping for breath while one notes its slender acorns, sometimes more than half covered by the dark-brown, scaly cups. At higher elevations this tree degenerates into very tough chaparral. It is found throughout the State, in the foothills and valleys, usually away from the coast.

The **canyon live oak** (fig. 16) is a glorious tree, with scaly, whitish bark. It is sometimes called the maul oak because it makes such superb mauls or mallets for use in driving the frow when making split shakes. At an elevation of 2,000 to 3,000 feet in the canyons of the Sierra it is abundant and attains a good growth, with a height of 60 feet and a girth of 9 to 12 feet; in less favorable places it is 20 to 30 feet high and 1 to 2 feet through; but in the bottom lands of valleys in Mendocino and Humboldt Counties it is a noble tree, 80 to 95 feet high and from 4 to 6 feet in diameter. Large trees have an odd habit of forming buttresses at their bases, which sometimes grow out from the trunk with sufficient abruptness to form seats. The leaves vary greatly, being sometimes entire at the edge, sometimes toothed; but like the rest of the evergreen oaks they are never incised, as are the valley white, the California black, and other deciduous oaks. The acorns are very unusual because of the yellow

fuzz that covers the cups, hiding their scales and giving the oak still another common name—that of “golden cup oak.”

What is reputed to be the largest canyon live oak tree is found in the Stanislaus National Forest close to the Buchanan (or Clavey) Road, 8 miles east from Tuolumne. It is a very symmetrical speci-



FIGURE 16.—Canyon live oak (*Quercus chrysolepis*)

F193459

men with immense spreading limbs starting about 8 feet up from the base of the big trunk, having a spread of 131 feet. It is 31½ feet in circumference at the base, and the height is estimated at 60 feet. The tree is estimated to be 700 years old and is a very healthy, vigorous-looking specimen.

SCRUB OAKS

One of the most interesting and useful groups of trees is that which goes under the name of "scrub oaks." They are really not trees at all, but bushes from 4 to 12 feet high. They are great soil makers and soil holders, often growing in dense thickets on open, dry ridges, slowly breaking into the rock that lies so near the surface and holding the soil they make by the network of their roots. Over thousands of acres they are all that keep the winter rains from sluicing the surface soil off the rocks, thus filling up the artificial lakes with sand or breaking the dams with a sudden rush of water. One hears the facetious laugh at some of the southern California brush "forests," and ask if there is a tree in them. But it is the protection afforded by these very scrub oaks, so absurdly unforestlike in appearance, which is really responsible for some of Mother Nature's most effective forestry in California.

The principal bush oak in the northern part of the State, from the Oregon border to the Kaweah Basin in Tulare County, is the **Brewer oak**, a beautiful little thicket-forming shrub, sometimes a lovely round-headed miniature tree, with good-sized acorns. The leaves of Brewer oak are lobed like those of Oregon white (Garry) oak, but are much smaller— $1\frac{1}{2}$ to $3\frac{1}{2}$ inches long—while the stems or trunks are 2 to 4 inches in diameter, gray in color. After the leaves drop in the late fall a hill slope of Brewer oaks looks all gray, like a mist on the mountain.

The **California scrub oak**, the principal scrub oak of the southern part of the State, appropriately bears the specific name *dumosa*. It is seldom over 8 feet high and has a great variety of leaf forms, sometimes producing on the same plant leaves with smooth edges, leaves twisted at the edges and set with pricklers, and leaves deeply lobed. The general effect, however, is of pricker-edged leaves. Try to force your way through a thicket of California scrub oak and you will indorse this statement. The oval acorns, from three-fourths to $1\frac{1}{3}$ inches in length, are set in shallow saucers rather than in cups; these saucers look as if they had been quilted. In size and shape the acorns vary almost as much as the leaves. The leaves of one season stay until the next spring's growth pushes them off.

Away up in the northwestern corner of the State, and extending into southwestern Oregon, is a most interesting shrub, the **Sadler oak**, the sole Pacific representative of the chestnut oak group. Occasionally reaching a height of 8 feet, it is more often under 3 feet in height, but has surprisingly large leaves for such a small oak. These leaves, 3 to 4 inches long, are heavily veined on the underside, the veins ending like pricklers that beset the edges of the leaves. The leaf stems, one-half inch or more long, are positively furry with rust-colored hairs.

In addition to these three distinct sorts of scrub oak there are varieties of the taller oaks. The **huckleberry oak**, for instance, has by some been considered a bush variety of the canyon live oak, and looks like an exquisite miniature of its big brother. The canyon live oak itself forms round green shrubs that cling to the sides of such canyons as the Yosemite and Kings River, and the highland

live oak, at 3,000 to 4,000 feet, on dry exposures, is the scrubbiest kind of a scrub oak. Once one's eyes are opened to the brush, it is delightful to come across a thicket or a single specimen of tough-twigged scrub that has acorns on it.

THE WILLOWS

In spite of California town camps, forest camps, and park camps to which pure water is piped, we enjoy camping by stream sides best of all. Here we have a chance to get acquainted with many sorts of water-loving trees, among them the willows of which about nine tree species occur natively in California.

Perhaps the weeping willow is the mind picture that comes to all of us; but that sort, though a favorite near the wells of our grandfathers, was planted there and is not native to North America. Seven of the nine native tree willows have the long-pointed narrow leaf typical of most willows, the other two—the **white willow**, and the **Dudley willow**, distinguished by their light or dark gray bark—have leaves broader in proportion to their length and rounded at the ends. Nearly all willows have at the foot of each leaf stem a pair of odd little often ear-shaped, leaflike growths (stipules) that are sometimes dropped during the summer, but most often persist and help us to distinguish willows from other trees. All the willows, too, have catkins (beginning before the leaves as pussy willows) for blossoms, and all have quinine-bitter bark.

California willows are seldom, if ever, over 50 feet high, and more often are from 20 to 40; the mountain sorts are still smaller and divided into many stems.

Even well-trained botanists, with all material at hand and a good glass, sometimes have difficulty in distinguishing one species of willow from another. It is enough for the rest of us to know that a willow is a willow and to enjoy its beauty and shade from the "pussies" of spring to the lemon-yellow foliage of fall.

THE POPLARS

There are three sorts of these water-loving trees in California—the aspen of the mountains, the black cottonwood of the foothill canyons, and the Fremont cottonwood of the lower valleys. All have heart-shaped leaves that turn yellow in the fall; their bloom is a pendant catkin—or rather two catkins—one bearing the pollen dust on the male tree, the other eventually producing the "cotton" on the female tree. The poplars and the willows grow under similar conditions and are often found together.

Most of us are lucky enough to know the little **aspen**—the "quaking asp" (fig. 17)—for it grows in Alaska, Canada, the eastern United States as far south as Missouri, the Western States, and Mexico, at elevations varying from sea level to over 10,000 feet. It is the tree whose small heart-shaped leaves dance at the slightest breeze. A group at the other end of a meadow or a whole hillside of them, golden yellow in the fall, with a leaf here and there floating away on the wind, is a never-to-be-forgotten sight.

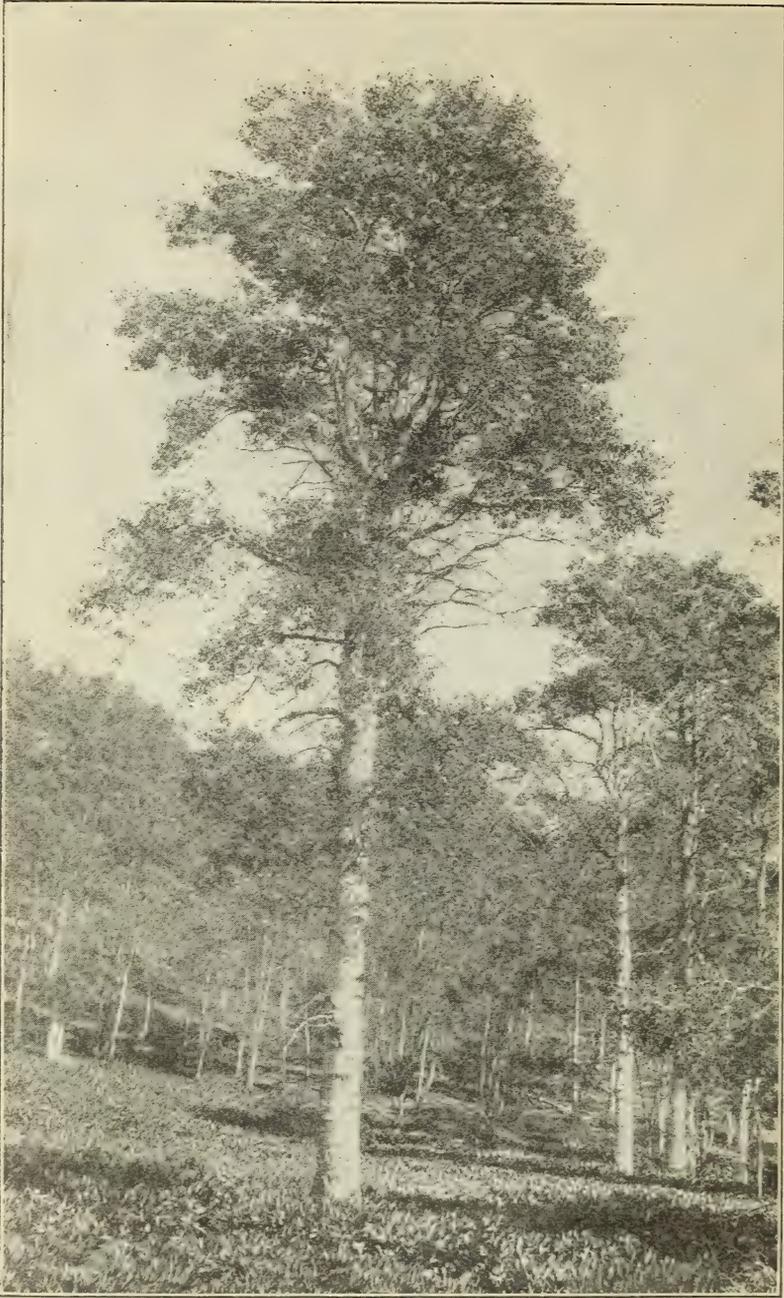


FIGURE 17.—Aspen (*Populus tremuloides*, var. *aurca*)

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The **black cottonwood**, the largest "popple" in California, is found at elevations from 3,000 to 6,000 feet, abundantly in the Sierra, less frequently in the coast ranges. The leaves are longer pointed than our two other species—deep, shining green above, whitish below—and the bark is much darker and heavily ridged. It is largest in the rich flats in its lower elevations, sometimes being 125 feet high and 6 feet through, and is smaller as the elevation increases. At its best this tree furnishes real lumber, tough and pliant, odorless and tasteless, hence good for barrel staves, butter firkins, candy baskets, and such wares.

The **Fremont cottonwood** is the common cottonwood of the lower valley stream sides, found in plenty along the Sacramento and San Joaquin Rivers and their branches. Its bark is also ridged, but is light brown in color; sometimes, at 3,000 feet it is silvery and when bare suggests white birch stems. Even under the best conditions the tree seldom grows upright, but leans over. When old and hollow-hearted it sometimes fairly lies down along the river bank, though still sending up vigorous branches. This growth habit of Fremont cottonwood is of important service in holding the shifting soils of the banks of our bottom-land streams.

THE MAPLES

There is but one large maple on the Pacific coast, the **bigleaf maple**, sometimes called the Oregon maple, but fortunately that is well distributed, being found from Alaska through British Columbia, Washington, Oregon, and California. Here in California it can be seen in the Coast Range valleys from one end of the State to the other, and in those of the Sierra Nevada from the Oregon line down to the Sequoia National Park, with occasional groups or single specimens in the cross ranges. While it prefers moist, gravelly soil and attains its greatest size and beauty on the bottom lands in Oregon, fairly good specimens are also found on the ridges and hill slopes. The writer remembers noting 20 years ago, on the trail from Mill Valley to Tamalpais, that the forest floor for miles was carpeted with maple seedlings; not long ago, climbing the trail from the Happy Isles to Vernal Falls in Yosemite Valley, he looked down on fine, vigorous maple trees.

Bigleaf maple is not the glory of the fall that the eastern maples are, for the leaves are thicker and only an occasional tree turns golden yellow. But the spring foliage is fine and green, while the leaves attain a breadth of from 7 to 14 inches. The flower clusters, coming with the leaves, are yellow and attract the bees almost as much as those of the elms. The shape of the leaves is like the ordinary maple, or rather more like a grape leaf, not quite so sharply and deeply cut as the sugar maple.

There are two dwarf maples that come down into California from Oregon; one mainly in the Sierra, the other chiefly a Coast Range species. The Coast Range species, called **vine maple** because of its tendency to sprawl rather than stand upright, is hardly ever more than a shrub. It has foliage similar to and as gorgeous as a Japanese maple, both in its rosy spring color and in its flaming scarlet, yellow, or rose of fall. It has not been reported farther south than Mendocino County.

The **Douglas maple** is much less brilliant, though becoming somewhat colored. Its leaves are like those of the Japanese maple in shape, and it is a pretty thing, found at 3,000 to 6,000 feet elevation, along streams, not very abundantly.

The **California boxelder** is botanically of the same genus as the maples, and if one looked only at the seeds, which are distinctly maple "keys," there would be no doubt about it. But most of us nonbotanists judge a tree by its leaves, and the California boxelder leaf is parted into three (occasionally five) leaflets instead of being a single incut leaf. The tree haunts the stream bottoms, where one finds it with willows and sycamores. It is not large (20 to 50 feet high and 10 to 30 inches in diameter), but helps make the good green along the creeks.

None of the Pacific maples within the California range make good lumber, not even very good firewood. If their wood is ever used at all commercially, it will be as pulpwood. In Oregon and Washington, however, the bigleaf maple becomes a large tree and is cut for lumber and fuel.

THE ALDERS AND A BIRCH

When camping near a stream have you noticed a rather smooth-barked tree with round open head, its lower branches drooping, and the tips bearing odd clusters of tiny cones? This is one of the alders, the two larger sorts being rather hard to distinguish. In both, the leaf veins are conspicuous for their straightness, the side veins running from the mid vein straight to the edge of the 3-inch leaf, giving it the effect of a "permanent wave." The **red alder** has somewhat darker foliage than the **white alder**, and smoother gray bark. White alders, when large, are rather rough and scaly toward the base of their trunks.

While generally taller than the willows and maples, with which they associate along our streams, they are still medium-sized trees, seldom attaining a height of even 90 feet. Sometimes, growing close together and excluding other species, they form straight, clean stems bending at the top over the water.

The leaves do not color at all in the fall; indeed, they drop while still green, leaving the tree bare for a long season. But the alders are the earliest of all the stream-side trees to bloom when they put out their pendant catkins, known as "tags," strung along a stem. The Sierra species, the **mountain alder** (fig. 18), would almost meet the description given above for the two that grow at lower elevations, except that it is only 6 to 25 feet in height, is more markedly and beautifully toothed, and has more reddish color on the early stems that hold the tags. The main value of this mountain alder is as protection for the headwaters of streams—unless it be a credit to this dwarf tree that it trains one's patience by catching and holding one's fishline.

Even higher up than the mountain alder, and over on the eastern slopes of the Sierra, is found **red birch**, the only tree birch growing naturally in California. Its shining "old copper-colored bark," as Sudworth describes it, distinguishes it at once from other stream-side

growth. It is more often a mere shrub, but has been found as large as 30 feet high and 10 inches in diameter.

Red birch has very small, saw-toothed leaves of an oval type. Like the alders, the seeds come in tiny cones, but these fall to pieces when the seeds mature; and, anyhow, there is only one cone in a place instead of the branched twig holding several cones and persisting long after the opening bracts have let the alder seed fly out.

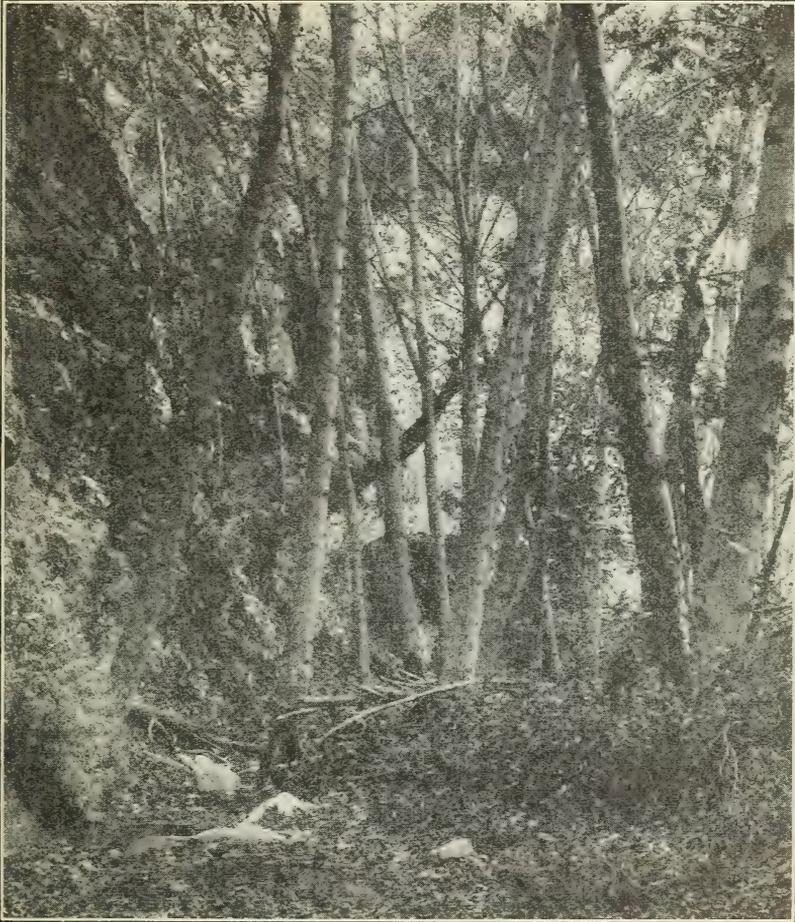


FIGURE 18.—Mountain alder (*Alnus tenuifolia*)

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You can see this dainty little birch at the south end of Shasta Valley, in the canyons on the west side of Owens Valley, near Mono Lake, above Simpson meadow in the Middle Fork of Kings; also in Bubbs Creek Canyon, in the Siskiyou Mountains, and elsewhere.

PALM, YUCCA, INDIGO BUSH

In spite of the advertising on the Atlantic coast of "native California dates," in spite of the long-time experiments with date-bearing

palms from Tulare south to Imperial, and of ornamental palms and palmettos in gardens all over the State, we are bound to acknowledge that our one native palm is the **California palm** (fig. 19), known also as desert fan, or Washington palm. It is a beautiful, hardy thing. Its fruit is eaten by Indians (and who has a better right to the native fruits?), and it is said that generations ago the Indians of Palm Valley thatched their huts with the leaves. For most of us, however, it is an ornamental tree, seen where it is native in the canyons opening into the Colorado Desert of

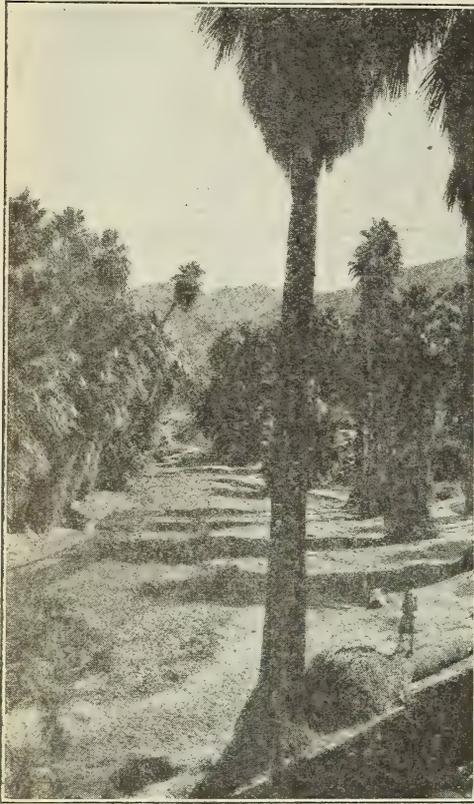


FIGURE 19.—California palm (*Washingtonia filamentosa*)

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the southeastern part of the State—Palm Canyon, Lukens Canyon, Thousand Palms Canyon, etc. In these canyons it reaches a height of from 20 to 75 feet. Under cultivation it may do better than this. In Los Angeles are two great California palms that must be 100 feet high; they are said to have been planted by the fathers 200 years ago. There is no need for a description of California palm, with its plaited fans of circular leaves, its thorny-edged leafstalks, and its dead-drooping-leaf-clothed trunk, "like a dirty apron tied over a silk gown," as some one aptly said. But everyone who can take the time should certainly manage a trip to Palm Canyon to see the tree in its native haunts.

Probably the most wild-looking denizen of the desert hills and plains is the **Joshua tree** (fig. 20). The keenly pointed bayonetlike leaves, bristling at the ends of big clumsy

branches, defy intrusion and compel respect from natural enemies. When from 3 to 6 feet high even the trunks are set with bristling leaves down to the ground and as the stem increases in length the first leaves grown begin to droop, finally dying and becoming closely appressed in a thatchlike covering about the trunk. The Joshua tree is one of the four yuccas native to the Pacific region and has been known to grow to a tree 54 feet high and 16 feet in circumference. It is found on the northern rim of the Mohave Desert, and a veritable forest of these trees may be seen along the road from Palmdale to Mohave.

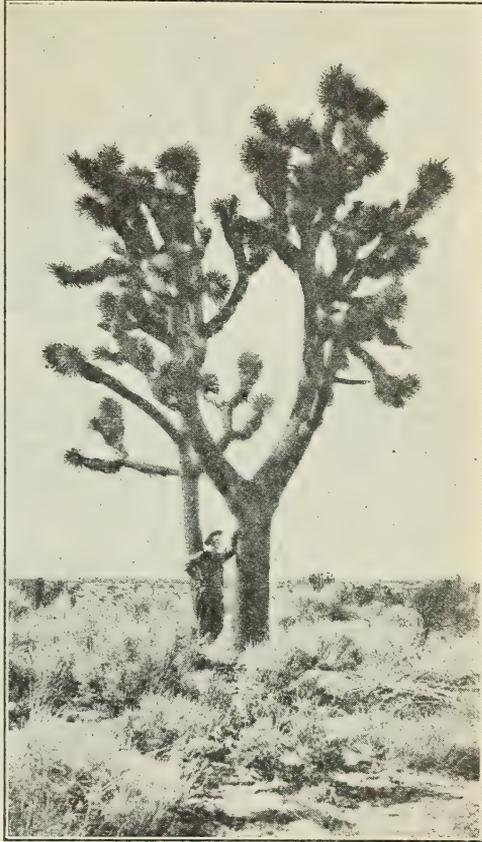
The **indigo bush**, perhaps better called "tree pea" and often known as smoke tree because of the smoky-grey color of its slender, drooping branchlets and leaves, sometimes grows into a bushy, many-branched tree from 4 to 25 feet high. It somewhat suggests the tamarisk and is found on the Colorado Desert, a small forest of them being along the road from Palm Springs to Indio.

THE MADRONE

We Californians boast of having the biggest coniferous trees in the world, and of growing the biggest pumpkins—even of having the tallest and finest tarweed. But not all of us happen to know that we might also boast of the greatest heather. The California **madrone**, or **madroña**, is a member of the heath family; each white blossom of the great clusters one sees away up overhead is an urn, as is usual in the blooms of the heath family, and what a great heath it is—20 to 125 feet high, with a trunk 6 inches to 5 feet in diameter.

While found only on the Pacific coast, it is not confined to California by any means, occurring in British Columbia, Washington, and Oregon as well. In California it grows as far south as the South Fork of the Tuolumne River in the Stanislaus National Forest, in the Sierra Nevada, and in the Coast Range canyons as far south, though rarely, as San Bernardino County.

This beautiful evergreen tree, with smooth, terracotta colored bark (darker and rougher in the lower part of the trunk of old trees), and its deep-green 4 to 6 inch smooth-edged leaves, brilliantly glossy above and somewhat fuzzy underneath, is common in Santa Cruz County, in Sonoma, and in Mendocino. The Ukiah (Mendocino County) parks are full of it. The town camp ground has many wonderful specimens, and a large majority of the homes have one to half a dozen of these trees in their grounds, so that the town seems set in a grove of madrones, white and fragrant in blooming season and brilliant with round red berries in November or December. Each



F172645

FIGURE 20.—Joshua tree (*Yucca arborescens*)

berry is about a third of an inch through and is rough like an orange, not smooth and glossy like the leaves of the tree or the berry of the California holly.

THE CALIFORNIA WALNUT

The joy of the early comers to California in the fifties upon finding walnuts growing along the creeks, from the lower Sacramento clear south, soon gave way to disgust as the nut meats were found to be meager and the trees so small and limby as to render the wood almost useless for cabinet work. To this day it is used in its native habitat, mainly as a soil holder or to furnish firewood, though nurserymen find that seedlings of the **California walnut** form the finest disease-resistant stock on which to graft the soft-shell English sorts. It grows along many streams 20 to 40 miles from the coast and occasionally occurs in the Sierra foothills. In the coast canyons—along Walnut Creek in Contra Costa County, for example—its rich green marks the course of the stream for long distances, the trees growing from 20 to 50 feet high.

The leaves are what are called "pinnate," that is, they are formed, like those of ash and elder, of leaflets in pairs along a central axis or leafstalk (the rachis), each leaflet looking like a complete leaf. The walnut leaves and the green bark of the small branchlets have a sharp pungent odor. The old bark of the main trunk is very dark and cut into deep ridges, while the newer bark of the main branches is gray. This characteristic bark aids one to identify the tree, although the little conspicuously raised, 3-lobed, shieldlike leaf scars on the younger twigs also help.

THE CALIFORNIA SYCAMORE

Along certain creeks in either coast or Sierra canyons, one finds the **California sycamore** (fig. 21), white barked and, except when growing in a deep canyon, sprawling lazily over the landscape. The wood is rather brittle and under weight of leaves or in heavy storms, branches break off, leaving the sturdy trunk to send out new sprouts. Then in the spring, on these new shoots and the branches that did not break, come the large leaves suggestive of grape leaves, only more deeply cut. A fungous growth promptly attacks these first leaves, killing almost every one and forcing a second leaf crop. This forms a good shade, not too heavy, the joy of the camper because not as cold as a denser shade and yet not hot like the open. Children, too, love the sycamore—"dandy climbers," as they call them. The bloom is different from that of any other tree, being an open cluster of three or more balls about three-quarters of an inch in diameter.

THE OREGON ASH

There is just one timber ash in California, commonly known as the **Oregon ash**, though found from Puget Sound to San Bernardino, in both Coast Range and western Sierra canyons, along streams, and in the open. The leaves are compound, with five to seven yellow-green leaflets, fuzzy underneath. The two sorts of bloom (male and

female) occur on separate trees, the female later developing into hanging clusters of winged seeds.

Like the eastern ashes this tree forms in its rapid-growing new shoots a tough elastic timber, highly valued by woodworkers and once much sought for wagon tongues.

THE CALIFORNIA LAUREL

The **California laurel**, a sharply fragrant, broad-leaf evergreen tree, is found along streams in the coast hills from southern Oregon to Los Angeles and in canyons of the west slopes of the Sierra from Shasta to Tulare County. Where conditions are favorable, as on certain rich bottoms in Sonoma and Mendocino Counties, it

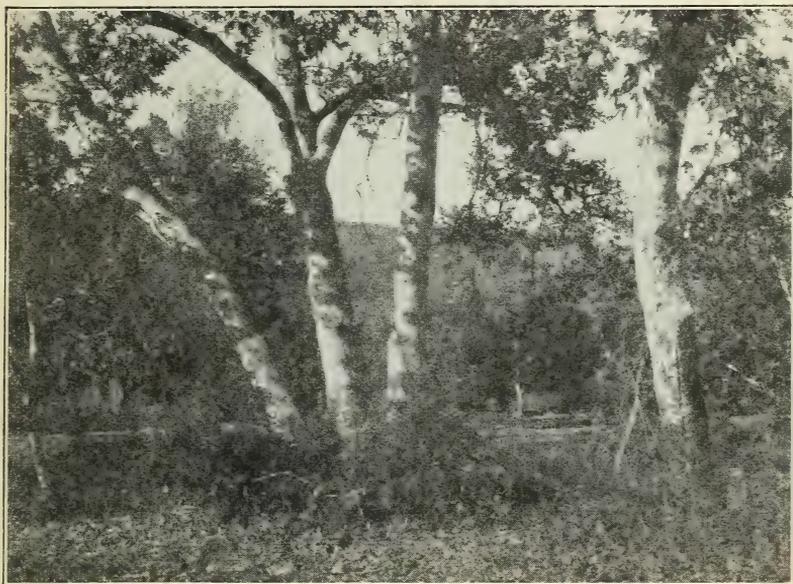


FIGURE 21.—California sycamore (*Platanus racemosa*)

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makes a tree 60 to 80 feet high and 2 to 3 feet in diameter. On a sandy Sierra foothill slope it grows into a many-stemmed shrub 4 to 10 feet high. In either case the leaves are a rich, shining green from 3 to 6 inches long and from one-third to 1½ inches wide. Dried, these form a perfectly good substitute for the bay leaves of the French cooks, giving an indescribable flavor to soups, stews, and pot roasts but not to be left in pot or kettle more than five minutes, it is advised.

The fruit (technically a drupe) is somewhat nutlike, often solitary but sometimes in clusters of two to five, with a pale-green skin that eventually turns black and in both stages suggests an olive. But don't follow the suggestion and try to eat it. The wood is much the most beautiful of our native woods and is used commercially, though to a limited extent, as the species occurs only in scattered growth. Because of its lovely red-brown, heavy heartwood, Cali-

ifornia laurel is well worth preserving and planting. In the northern coast counties it is known as "pepper wood," and, in Oregon, as "Oregon myrtle," but its kinsfolk are in the laurel family far removed from the true myrtles.

THE DOGWOOD

The **Pacific dogwood** (fig. 22) is one of the most decorative of all the small trees of California. It is found in gulches, ravines, and along mountain streams. In the spring it is conspicuous because of its showy white or pinkish floral bracts that unbotanical folk very naturally mistake for petals, and in the fall the scarlet and orange-colored leaves add greatly to the beauty of the woods. This sole



FIGURE 22.—Pacific dogwood (*Cornus nuttallii*)

F 162520

flowering dogwood of western North America sometimes grows 20 or 30 feet high and 6 or 8 inches in diameter, and has a thin, mottled, grayish bark.

THE BUCKEYE

The **California Buckeye** has been left until the last of the trees, as the writer is uncertain whether to group it with trees or with the ornamental treelike shrubs. However, it sometimes grows from 25 to 30 feet high, so it should probably be put with the trees.

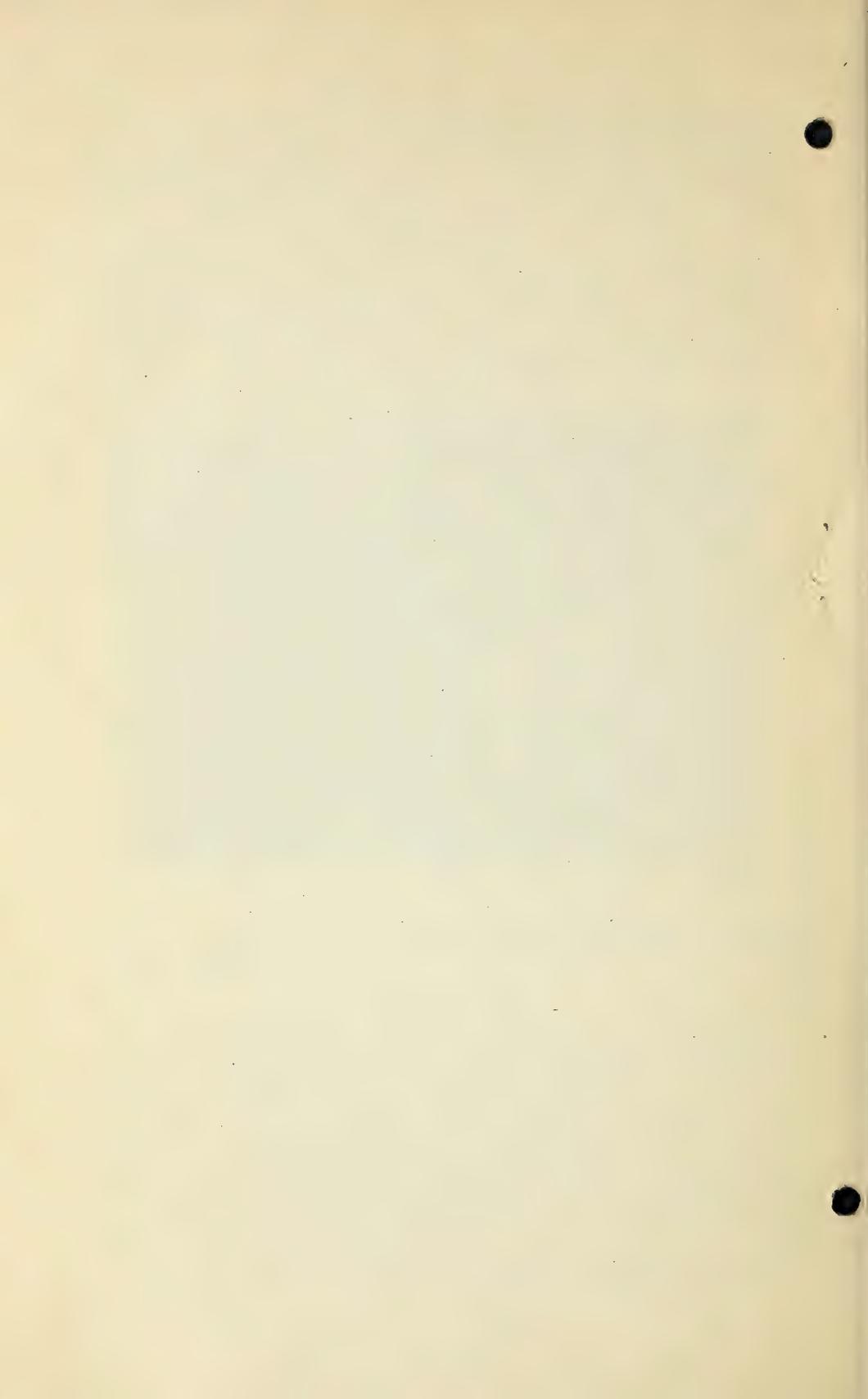
California buckeye is the first tree in the Sierra foothills to put out new green in the spring, the vivid 5 to 7 fingered leaves shining against the pale stems, and followed by the glorious upright clusters (thyrses) of fragrant bloom. Usually from 10 to 20 feet high and 3 to 6 inches in diameter, this tree occasionally reaches a height of 30 feet and a diameter of 20 inches.

In the fall the buckeye leaves are the first to turn—a soft woods brown—and then drop before other trees are ready to lose their

leaves. What remains is the gray trunk and whitish branches or the many white stems of a shrub, from which hang the pear-shaped, gray-green fruit. Shortly the green outer husk splits and the glossy brown eye looks out. Then in a few days the ripened fruit falls. This seed, the buckeye, is a thing of beauty, but do not take it home. It will be dull and shriveled very soon, and besides, the youngsters will be sure to try to eat it. Do not let them. It is liable to produce nausea, and there have been well-authenticated cases of poisoning and even death from eating it raw, although it is edible after roasting or boiling. At the best, it is sure to leave a most unpleasant sting in mouth and throat, because it contains so much saponin—essence of soap, as one might say.

The California buckeye, either as tree or bush, is found almost anywhere in the western foothills of the Sierra, from Mount Shasta to the Santa Barbara Mountains, and in the Coast Range.

A people without children would face a hopeless future; a country without trees is almost as hopeless.—THEODORE ROOSEVELT.



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Cottonwood (<i>Populus</i>) (See also Aspen):	
black (<i>P. trichocarpa</i>)-----	27
Fremont (<i>P. Fremontii</i>)-----	27
Cypress (<i>Cupressus</i>):	
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Gowen (<i>C. goweniana</i> , syn. <i>C. pygmaea</i>)-----	16
Lawson. See Cedar, Port Orford	
Macnab (<i>C. macnabiana</i>)-----	16
Monterey (<i>C. macrocarpa</i>)-----	16
Dogwood, Pacific (<i>Cornus nuttallii</i>)-----	34
Douglas Fir (<i>Pseudotsuga taxifolia</i> , syn. <i>P. mucronata</i>)-----	11
Fir (<i>Abies</i>) See also Douglas fir:	
bristlecone (<i>A. venusta</i>)-----	11
California red (<i>A. magnifica</i>)-----	10
Douglas See Douglas fir (<i>Pseudotsuga taxifolia</i>)	
white (<i>A. concolor</i>)-----	9
Hemlock (<i>Tsuga</i>):	
mountain (<i>T. mertensiana</i>)-----	17
western (<i>T. heterophylla</i>)-----	17
Indigo bush (<i>Dalea spinosa</i> , syn. <i>Parosela spinosa</i>)-----	31
Joshua-tree (<i>Yucca brevifolia</i> , syns. <i>Y. arborescens</i> and <i>Cleisroyucca brevifolia</i>)-----	30
Juniper (<i>Juniperus</i>):	
California (<i>J. californica</i>)-----	15
western or Sierra (<i>J. occidentalis</i>)-----	13
Laurel, California (<i>Umbellularia californica</i>)-----	33
Madrone or madrona (<i>Arbutus menziesii</i>)-----	31
Maple (<i>Acer</i>) See also Boxelder:	
bigleaf (<i>A. macrophyllum</i>)-----	27
Douglas (<i>A. douglasii</i>)-----	28
vine (<i>A. circinatum</i>)-----	28
Nutmeg, California (<i>Tunjon californicum</i> , syn. <i>Torreya californica</i>)-----	17
Oak (<i>Quercus</i>) See also Tan oak (<i>Lithocarpus</i>):	
Brewer (<i>Q. oerstediana</i> , syn. <i>G. breweri</i>)-----	24
California black (<i>Q. kelloggii</i> , syn. <i>Q. californica</i>)-----	21
California blue (<i>Q. douglasii</i>)-----	20
California scrub (<i>Q. dumosa</i>)-----	24
canyon live (<i>Q. chrysolepis</i>)-----	22
coast live (<i>Q. agrifolia</i>)-----	22
evergreen black (<i>Q. morehus</i>)-----	19
evergreen white (<i>Q. engelmannii</i>)-----	22
highland live (<i>Q. wislizenii</i>)-----	22
huckleberry (<i>Q. vaccinifolia</i> syn. <i>G. chrysolepis vaccinifolia</i>)-----	24
Oregon white, or Garry (<i>Q. garryana</i>)-----	21
Sadler (<i>Q. sadleriana</i>)-----	24
tan See Tan oak (<i>Lithocarpus densiflora</i> , syn. <i>Quercus densiflora</i>)	
valley white (<i>Q. lobata</i>)-----	19

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Palm, California (<i>Washingtonia filamentosa</i>)-----	30
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Bishop (<i>P. muricata</i>)-----	7
bristlecone (<i>P. aristata</i>)-----	5
Coulter (<i>P. coulteri</i>)-----	2
Digger (<i>P. sabiniana</i>)-----	3
foxtail (<i>P. balfouriana</i>)-----	5
Jeffrey (<i>P. jeffreyi</i>)-----	1
knobcone (<i>P. attenuata</i>)-----	7
limber (<i>P. flexilis</i>)-----	5
lodgepole (<i>P. contorta</i>)-----	7
Monterey (<i>P. radiata</i>)-----	4
Parry pinon (<i>P. parryana</i> , syn. <i>P. quadrifolia</i>)-----	5
singleleaf pinon (<i>P. monophylla</i>)-----	5
sugar (<i>P. lambertiana</i>)-----	1
Torrey (<i>P. torreyana</i>)-----	7
western white (<i>P. monticola</i>)-----	7
western yellow (<i>P. ponderosa</i>)-----	1
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Redwood (<i>Sequoia sempervirens</i>)-----	13
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Dudley (<i>S. gooddingii</i>)-----	25
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