

WOODBIDGE METCALF

INTERESTING TREES IN CALIFORNIA

UNIVERSITY OF CALIFORNIA
AGRICULTURAL EXTENSION SERVICE

Because of its size and great diversity of topography, California contains a great variety of native tree species. These range in size from the giant Sierra and coast redwoods, sugar and ponderosa pines, firs, incense cedars and Douglas firs, to the dwarf trees of the high mountains and desert washes.

For over a hundred years the settled portions of the State have been planted with ornamental trees from many parts of the world, so that large specimens of exotic species are now seen in many parks and gardens. The lowlands are so similar in climate to the Mediterranean region and to Australia that many trees from those regions are commonly seen. South America, Europe, Asia and Eastern America are also well represented. It is not difficult to find from fifty to one hundred tree species within a few blocks in some coastal cities. Several of the tree collections number well over two hundred species.

From south to north the leading California tree collections include:

City of San Diego: Balboa Park. Also a fine zoological garden.

San Marino: Huntington Gardens.

Santa Anita: Los Angeles State and County Arboretum.

City of Los Angeles: Griffith Park

Santa Monica: Uplifter's Club, Old Forestry Station. Eucalyptus collection.

Santa Barbara: Botanic Garden. Native species.

City of Fresno: Roeding Park. A fine collection of tree ornamentals.

City of Modesto: Grace-Ada Park and fine street trees.

Sacramento: Capitol Park. Fine stone pines and Civil War Battlefields Grove.

Palo Alto: Stanford University Campus.

City of San Francisco: Golden Gate Park. A very large collection.

Berkeley: University of California Campus.

Berkeley: Regional Park Botanic Garden, Tilden Park, Native trees.

City of Chico: Bidwell Park. Fine natives and Old Chico Forestry Station.

Placerville: Institute of Forest Genetics, U.S.F.S. Pine collection.

Cover:

COAST REDWOOD,
Sequoia sempervirens

NATIVE FOREST STANDS

The National Forests, National and State Parks, and many private timberlands along highways offer excellent opportunities for observation of important native timber stands and fine individual specimens. California contains about seventeen million acres of high quality timberlands, of which approximately a million acres have been set aside in parks and wilderness areas for observation and recreational use. The total stand in 1955 is estimated at 360 billion board feet of timber of which about six billion board feet are being cut each year. All of the main highways across the Sierra Nevada Mountains go through timber stands of important species between elevations of 2500 to 7500 feet. Stands of coast redwood and associated species are available from Santa Cruz County north to the Oregon-California state line. A few outstanding examples may be listed.

Sierra redwood, *Sequoia gigantea* in Sequoia and Kings Canyon National Parks, Calaveras Big Trees State Park, and Wawona Grove, Yosemite National Park.

Coast redwood, *Sequoia sempervirens*,—Big Basin and Cowell Redwood Parks in Santa Cruz County, Muir Woods in Marin County, and along the Redwood Highway (101) from Mendocino County to the Oregon line.

Ponderosa pine, *Pinus ponderosa*,—general throughout the main timber belt of the Sierra in the mixed forest with incense cedar, *Libocedrus decurrens*, white fir, *Abies concolor*, California black oak, *Quercus kelloggii*, and Maul oak, *Quercus chrysolepis* and the following:

Sugar pine, *Pinus lambertiana*, is usually on cooler north and east slopes and at somewhat higher elevations, often with Jeffrey pine, *P. jeffreyi* and California red fir, *Abies magnifica*.

Douglas fir, *Pseudotsuga taxifolia*, in point of volume, is now the most important timber tree in California as well as in Oregon and Washington. It is an associate of coast redwood from Santa Cruz to Del Norte counties, is widely distributed throughout the North Coast Range and is a feature of the mixed forest stands from about Yosemite Valley north in the Sierra.

Sitka spruce, *Picea sitchensis*, comes down from the north along the coast to central Mendocino County together with its other northern associates: Grand fir, *Abies grandis*, Western red cedar, *Thuja plicata*, Western hemlock, *Tsuga heterophylla*, and Port Orford cedar, *Chamaecyparis lawsoniana*. Good specimens of all of these may be seen in the Humboldt Bay area and along Highway 101; from there north through Del Norte County and along the Smith River road to Grants Pass, Oregon.

Monterey pine, *Pinus radiata*, grown naturally south of San Francisco Bay within two or three miles of the ocean in small areas to Cambria, San Luis Obispo County. The largest stand covers several square miles on the Monterey Peninsula. The famous Seventeen Mile Drive traverses much of this forest and also gives an opportunity to see picturesque forms of Monterey cypress, *Cupressus macrocarpa*, at Cypress Point and across the Carmel River at Point Lobos. Coast live oak, *Quercus agrifolia*, and bishop pine, *Pinus muricata*, are also found in this forest, but better stands of bishop pine are to be seen along the north coast from Point Reyes Peninsula to the most northerly representatives near Cape Trinidad north of Eureka with best stands along Highway 1 in Sonoma and Mendocino Counties. From Mendocino north to British Columbia, on and near coastal sand dunes, are stands of the "beach pine" form of *Pinus contorta*. It has short, dark green needles in 2's, small, prickly cones and has remarkable ability to withstand heavy, salt-laden winds off the ocean.

Valley oak, *Quercus lobata*, is one of the most stately and beautiful of native California hardwood trees. It was widely distributed throughout valleys on fertile, bottomland soils and many fine, old specimens still grace the landscape in valleys of the Sacramento, San Joaquin, Santa Maria, Santa Clara, Napa, Russian and other rivers. Excellent specimens are to be seen near Solvang, Santa Barbara County, Paso Robles, San Luis Obispo County, Walnut Creek, Contra Costa County, Mooney Grove Park near Visalia, Tulare County, and at Bidwell Park at Chico in Butte County.

Coast live oak, *Quercus agrifolia*, is the most important oak within a few miles of the ocean from San Diego north to Mendocino County. Its gracefully rounded crowns of holly-like foliage are a notable feature of the landscape, and many of the trees grow to massive size. There are many fine specimens in and near Santa Barbara, Monterey, Santa Cruz, the San Francisco Bay region and through Marin, Sonoma and Napa counties.

Blue oak, *Quercus douglasii*, and interior live oak, *Quercus wislizenii*, are native species of the dry woodland foothills around the Great Valley from about 1500 to 3500 feet elevation, often in association with scattered trees of the long-needed, gray-green digger pine, *Pinus sabiniana*. Blue oak has finely divided light gray bark and its shallowly-lobed, oval leaves have a decidedly blue-green shade. Interior live oak has dark-colored bark and flat, holly-like, dark green leaves which are smooth and shiny both above and below.

Two fine oaks of the mountain timber belt are the deciduous California black oak, *Quercus kelloggii*, with its shiny, lobed leaves resembling those of the eastern red and black oak, and Canyon live oak, *Quercus chrysolepis*, which is a prominent feature of the rock ledges around Yosemite Valley and other mountain canyons. Its leaves are shiny green above, but lead-gray pubescent beneath, and the new foliage and the cups of the acorns have a decided yellow color, from which the tree is often known by the name golden-cup oak. The tree reaches large size and its wood is the densest and heaviest of all California oak species.

Tanbark oak, *Lithocarpus densiflora*, which is common in the redwood forest and at intervals in the northern Sierra timber belt, has heavy, smooth, gray-green bark, long, pubescent, chestnut-like leaves, and plump acorns borne in a fringed cup. When in full bloom, the long spikes of cream-colored male flowers are so numerous as to almost conceal the leaves. The bark is an important source of tannin.

California laurel, *Umbellularia californica*, which has about the same range as tanbark oak, is notable for the pungent, spicy fragrance of its leaves when crushed. From this it gets another common name, "pepperwood," and in Oregon it is known as "Oregon myrtle." Its evergreen leaves are smooth-margined, dark green and leathery in texture. Its small, clustered flowers are yellow-green in color. The fruits are large, olive-like drupes becoming purplish when ripe. Some mature specimens reach massive size with dark, furrowed bark and marked basal swelling of the trunk. The tree is common along Highway 101 north of San Francisco with several fine specimens at the roadside in Cloverdale, Sonoma County and throughout the redwood region.

Broadleaf maple, *Acer macrophyllum*, is the largest of western maples and is well named because of the very large size of its deeply lobed leaves. It is most common along shady canyons of the coastal mountains but also occurs sparingly at middle elevations in the central and northern Sierra timber belt. Its flower clusters are attractive in the spring, and the fruits add to the beauty of many trees in summer. It is occasionally planted as a garden or street tree.

STREAMSIDE TREES

Besides a number of willows which will not be considered here, there are several tree species which are commonly found along stream banks or on moist, bottomland flats. They are useful for planting in irrigated sections and are often used as ornamentals on lawns because of their tolerance for wet soil conditions.

California sycamore, *Platanus racemosa*, is common along streams in southern California, the foothills of the Sierra, and the central and south coast. Its leaves are large, deeply lobed and coated with a woolly pubescence. The ball-like fruits occur on a single pendant stem and persist on the tree well into the winter season. The smooth bark of the trunk is mottled

green and tan and many specimens achieve large size. Many sycamores are now in ragged and depleted condition because of repeated defoliation by the sycamore canker. This species is rarely used as an ornamental as the London plane, *P. acerifolia*, so commonly seen along city streets, is more rapid growing and somewhat more resistant to the disease.

Two slender-stemmed trees with smooth, gray bark, line stream banks throughout much of California. These are red alder, *Alnus rubra*, with coarse, doubly-serrate, large leaves of the coastal streams and bottomlands, and white alder, *Alnus rhombifolia*, of Sierra and southern California mountain streamsides at middle elevations. White alder has oval leaves with very fine teeth, and somewhat smaller fruits. Both are attractive trees and are occasionally used in ornamental plantings on heavily irrigated lawns. Two shrubby alders are found at higher elevations in the Sierra.

Two cottonwoods are features of the stream banks and lowlands. The Fremont cottonwood, *Populus fremontii*, a tree with the broad, flat-topped crown of delta-shaped leaves with coarsely toothed margins, is common throughout the Great Valley and southern California where it is sometimes planted for windbreaks and shelter. Western black cottonwood, *Populus trichocarpa*, is a larger tree of the Pacific Northwest which is found along coastal streams as far south as Santa Barbara County and in the Sierra at elevations usually above 4,000 feet. It has deeply furrowed bark, finely-serrate, taper-pointed leaves which are dark green above, usually with a golden-yellow cast beneath. Aspen, *Populus tremuloides*, is common both near and away from streams in the higher mountains as an associate of lodgepole pine, *P. contorta*, western white pine, *P. monticola*, red fir, *Abies magnifica*, mountain hemlock, *Tsuga mertensiana*, and other sub-alpine trees.



RED FIR, *Abies magnifica*

DESERT TREES

The single native palm tree of California has a very limited distribution in canyons near Palm Springs, but it has been widely planted throughout valley and coastal sections as a distinctive ornamental. California fan palm, *Washingtonia filifera*, has a stout trunk which reaches an ultimate height of about 75 feet. Under natural conditions it is usually clothed with the skirt-like, pendant dead leaves. The top is crowned by a rosette of large fan-shaped leaves which have long, stout and armed leaf stalks. The very similar Mexican Washington palm, *Washingtonia robusta*, is more commonly used as an ornamental. It has a more slender, and somewhat taller trunk. It is commonly seen in street plantings in southern California, sometimes in combination with the native species. One of the finest double rows of this slender palm is on Midlothian Drive in Altadena.

In the Coachella Valley are extensive commercial grove plantings of date palm, *Phoenix dactylifera*, which is characterized by the long, feather-veined leaves which have a somewhat gray-green color. This species is sometimes used as an ornamental in the Imperial Valley and throughout interior sections of southern California.

Canary Island palm, *Phoenix canariensis*, has even longer leaves than the date palm, so that the crown diameter is often twenty feet or more. The leaves are dark green and feather-shaped and the tree requires plenty of room for use as an ornamental. It has been more widely planted in valleys and along the coast as far north as Ukiah than any other palm with the possible exception of the native fan palm.

The plume palm, *Cocos plumosa*, from Brazil, is a favorite ornamental tree from Santa Barbara south in areas not too far from the coast. It becomes a tall tree and the leaves are long and gracefully plume-like. There are fine rows of plume palm in many of the cities in southern California.

The windmill palm, *Trachycarpus excelsa*, from China, is a small, slender tree with a rounded crown of fan-shaped leaves giving it a windmill-like appearance. It is commonly planted throughout coastal and valley sections. It requires less room than most of the other palms and so is often used along streets.

The most extensive collection of palms in California is at Huntington Gardens.

Joshua tree, *Yucca brevifolia*, is notable for its ability to grow in desert areas. There are fine examples in Joshua Tree National Monument and in the Mojave Desert near Palmdale and Victorville where their ungainly form of two or three branches topped by sparse foliage of long, leathery leaves is a prominent feature of the desert landscape. When in flower they take on added interest as the cream-colored blossoms are borne in dense clusters on erect spikes. This tree, really a tree lily, is rarely used as an ornamental.

Jerusalem thorn or paloverde, *Parkinsonia aculeata*, is not native in California, but has escaped from cultivation in many desert sections, so that its green stems, long, slender leaves with tiny leaflets, and masses of golden flowers are well known in interior sections. The pods are long, plump, and constricted between the seeds. There are fine highway trees of this species along Highway 99 between Bakersfield and the Grapevine Grade.

Blue paloverde, *Cercidium floridum*, is native in southeastern California and adjacent Arizona. It has shorter leaves than the preceding with fewer and broader leaflets, and bears great masses of yellow flowers which develop into flat pods when ripe. Upper trunk and branches have smooth, green bark. The tree is occasionally used as an ornamental in desert areas, but is not as common as the Jerusalem thorn.

Smoke tree or smoke thorn, *Dalea spinosa*, is a spiny, smoky-gray bush or small native tree of desert washes which has very few and transient leaves. When in flower in early spring, its blue blossoms give it a striking appearance.

Desert willow, *Chilopsis linearis*, with its slender leaves, lavender-to-white flowers and slender pods, similar to those of catalpa, is also native in desert washes and is occasionally used in warm sections as an attractive ornamental.

Two mesquite trees are native in California deserts. These are common mesquite, *Prosopis juliflora*, and screwbean mesquite, *Prosopis pubescens*. Both have rather large compound leaves, yellow pea-like flowers, and seeds in pods; the first a large, pulpy pod, the second a small twisted pod. Both are good ornamentals in desert areas.

ORNAMENTAL CONIFERS

It is perhaps well to describe several of the Araucarias from the southern hemisphere. They are quite widely planted, are unusual and striking in their foliage and habit of growth, and invariably arouse interest and comment.

Norfolk Island pine or star pine, *Araucaria excelsa*, from Norfolk Island in the Pacific, is the tallest of the group, and its regular, star-like arrangement of branches clothed with soft, dark green needles on horizontal or up-turned twigs make it an accent point of any landscape in which it is planted. Santa Bar-

bara's "Tree of Light" on the corner of Carrillo and Chapala Streets is of this species and there are many fine specimens throughout southern California and along the coast. Captain Cook's pine, *A. cookii*, is quite similar but less regular in branching habit, with the foliage in rounded, cloud-like masses. It is much less commonly planted.

Bunya Bunya, *Araucaria bidwillii*, from Australia, has a denser and more broadly rounded crown than the above. Its leaves are shiny, bright green, broad at the base and sharp pointed. The cones are large and pineapple-like in appearance. This tree is widely planted throughout valley and coastal areas and nearly every town has one or two good specimens. Two fine trees stand beside the Court House in Santa Rosa, one is at fire department headquarters in Salinas and a large specimen stands across Piedmont Avenue from International House in Berkeley.

Monkey puzzle, *Araucaria imbricata*, is the hardiest of all Araucarias and is found along the coast through Oregon and Washington. Native in Chile, it is commonly planted because of its grotesque, club-like branches which are thickly coated with broad, sharp, overlapping leathery leaves. These provide such a formidable armament that "not even a monkey can climb this tree." Most specimens are small-to-moderate in size as the growth is not rapid.

The true cedars—genus *Cedrus*—from India, Lebanon, Turkey and North Africa are probably more widely planted throughout California than any other ornamental conifers. They seem to thrive under many conditions from San Diego to Eureka along the coast, throughout most of the interior valleys and to elevations of 3,000 to 4,000 feet in the mountain country. They do not succeed in low desert areas. They are similar in appearance with slender needles borne in whorls on dwarf branches similar to the larches. The cones resemble those of the true firs and are borne erect on the branches and fall apart at maturity as in the genus *Abies*.

Mt. Atlas cedar, *Cedrus atlantica*, has shorter and somewhat stiffer needles, which are usually gray-green or bluish in color. The branches are generally shorter and more horizontal than those of deodar and the foliage not quite as dense.



MOUNT ATLAS CEDAR,
Cedrus atlantica

This tree of the Atlas Mountains in North Africa is usually seen as a park or garden specimen. Its cones are somewhat smaller than those of deodar.

Deodar cedar, *Cedrus deodara*, from the Himalayas, is more widely planted than any other conifer. Its needles are longest of the three, borne in dense masses on gracefully drooping branches, and the tip of the tree is usually nodding or pendant as in the hemlocks. The famous "Christmas Tree Avenue" in Altadena, and the equally beautiful North Van Ness Avenue in Fresno, are lined with large deodar cedars which are decorated each Christmas season. Many park and lawn specimens are similarly lighted each year as outdoor Christmas trees.

Lebanon cedar, *Cedrus libani*, from Lebanon and Turkey, has darker green and shorter needles than the other two, ascending branches, a stiffly erect tip and a gracefully tapering conical form. Its cones are of moderate size with tips which are somewhat more depressed than the others. Lebanon cedars are more rare in cultivation than the others. It seems evident that there are many intermediate forms which make exact identification difficult, especially in small trees.

Incense cedar, *Libocedrus decurrens*, the native cedar of the California mountain timber belt is one of the conifers most commonly seen in cultivation. It is hardy and easily moved as a seedling, so that many trees have survived rough treatment in transplanting from the mountains. The tree has a dense crown of flat sprays of foliage which is yellow-green in color. The leaf bases extend down the stem for some distance and are borne opposite in pairs. The tip of the tree is erect, and in cultivation many specimens assume a narrow, columnar form which is rare in forest stands. Bark on young stems is dark red, becoming ridged, brown and fibrous on older trunks. Cones are pendant, yellow-brown in color and have only two fertile scales with not more than four winged seeds. The foliage has a pungent odor and taste when crushed.

Port Orford cedar, *Chamaecyparis lawsoniana*, also known as Lawson cypress, is native along the north California coast where it is a large timber tree, producing lumber sometimes known as Pacific white cedar. It is widely planted as an ornamental and there are a number of

horticultural forms including one with erect, flat sprays of foliage known as "Scarab cypress" and golden-leaved varieties. The typical form is an erect, conical tree with dense masses of blue-green foliage on drooping twigs and a gracefully pendant tip. The leaves are much finer than those of incense cedar and are marked with white lines on the under side. Medium sized trees usually have many small, globular blue-green cones as a pleasing ornamental feature. If unpruned, several lower branches will turn up, so that the tree seems to be a group of stems. Two small Japanese cedars are occasionally seen in cultivation in gardens. These are *Chamaecyparis obtusa*, and *Chamaecyparis pisifera*. Both have flatter and more tufted sprays of foliage than the native species and are darker green in color.

Western red cedar, *Thuja plicata*, the giant arborvitae of the Pacific Northwest, is present in many gardens and park plantings. Its foliage is bright yellow-green and quite shiny. The leaves are plump and have a characteristic "cedar" odor and taste when crushed. The forest-tree type has a weeping tip and rather sparse foliage, while landscape forms are often globe-shaped with denser foliage. There are several good specimens on the University of California campus at Berkeley and in Golden Gate Park, San Francisco.

Oriental arborvitae, *Thuja orientalis*, from China, is a small tree with thin flat scale-like leaves, most commonly arranged in vertical, fan-like sprays. There are dense, globe-shaped forms and larger specimens with more open foliage. It is widely adapted to conditions throughout California being one of four conifers that thrive in low desert areas under irrigation. The erect, blue-green cones which contain several plump, wingless seeds are an attractive feature. It is one of the most commonly planted small conifers throughout the State.

Italian cypress, *Cupressus sempervirens*, with its deep green foliage, slender columnar habit of growth and large oval cones is the most popular "accent" tree among conifers. There are forms with short horizontal branches as well as the vertical type. It is a feature of many cemetery plantings and is widely used as an ornamental.

Monterey cypress, *Cupressus macrocarpa*,

native to the Monterey Peninsula, is very similar in foliage and cones, but becomes a large tree with spreading branches. In the past it was widely used for windbreaks and hedges, but the coryneum canker disease has virtually wiped it out south of San Francisco Bay, except near the coast in its native habitat. North of the Bay it is still flourishing, especially in areas close to the coast.

Arizona cypress, *Cupressus arizonica* (*C. glabra*) is a rapid growing, erect cypress with gray-green foliage, smooth or fibrous bark and large oval cones. It stands drought and heat well and is common as a windbreak and ornamental in interior valleys and low deserts under irriga-



ITALIAN CYPRESS,
Cupressus sempervirens

tion. The two forms are virtually inseparable as young trees.

Pygmy cypress, *Cupressus goveniana* var. *pygmaea*, is an interesting dwarf form on the Mendocino White Plains near Fort Bragg and Mendocino. On this very sterile site, trees mature and bear cones when but two to four feet tall, but on better soils within a half mile develop into fine specimens sixty feet or more in height. The associated trees include beach and bishop pines, tanbark oak, golden chinquapin and redwood, all dwarfed in size, and ornamental shrubs of rhododendron, wax myrtle, salal, and a beautiful dwarf manzanita.

Japanese sugi, *Cryptomeria japonica*, of the redwood family, has dark green angular needles somewhat resembling those of Sierra redwood and small terminal cones like those of coast redwood, but with leafy appendages on the scales. The variety *elegans* of this species, called plume sawara, has more slender and feathery foliage which assumes a characteristic reddish tinge during winter months. Both types are frequently seen in cultivation, where the sugi grows to large size while the variety is usually less than 15 feet in height.

PINES

Many species of pine do well in California garden plantings and are almost constant features of the landscape. The native Monterey pine is probably in most widespread use in coastal and valley areas because of its rapid growth and general hardiness. It is not long-lived, but specimens up to 50 inches in diameter and 90 feet tall have grown in gardens in 60 years. The finest collection of pines in the world is at the Institute of Forest Genetics near Placerville where about seventy species may be seen growing in the arboretum. Only a few of outstanding interest will be mentioned.

Canary Island pine, *Pinus canariensis*, is notable for its erect, conical crown of very long needles borne in threes, massive clusters of pollen-bearing flowers in spring, symmetrical cones up to six inches in length, and its attractively furrowed, light brown, flaky bark. It is common in coastal and valley plantings, but does not stand very cold weather. However, when damaged by frost or fire, it has the ability to replace its crown by sprouting if the tree is not too advanced in age.

Aleppo pine, *Pinus halepensis*, from the eastern Mediterranean region is the species most hardy in desert sections and hot interior valleys, but it does well along the coast also. Its needles borne in twos are short, slender and yellow-green in color, and the small, unarmed, symmetrical cones borne on stout stalks persist on the tree for many years after opening. The bark on young trees and branches of older specimens is smooth and gray in color, becoming furrowed and dark red-brown on mature trees. The trees are usually not large and are commonly much branched and spreading in habit of growth.

Italian stone pine, *Pinus pinea*, from the Mediterranean, is another striking ornamental because of its broadly rounded, "umbrella-like" crown of dark green needles which occur in twos. Its cones are bright brown when mature with rounded cone scales without prickles and about the size and shape of a baseball. Mature bark is deeply furrowed and dark red-brown in color. The finest trees of this species in California are those at Capitol Park, Sacramento where they have reached massive size.

Maritime pine, *Pinus pinaster*, from France, is another two-needled species occasionally seen in gardens. The needles are coarse and stiff and the bark on mature trees very dark and deeply furrowed with a deep crimson tint. The tree is tall and of good form, but is not long-lived in most situations.

Coulter pine, *Pinus coulteri*, native of the south coast ranges and southern California, is a very hardy and drought resistant species notable for its very long, gray-green, stout needles borne in threes and the most massive cones of all pines. These are yellow-brown in color, sometimes reach 15 inches in length and are armed with stout, curved spurs on the cone scales.

Torrey pine, *Pinus torreyana*, of San Diego County, has the most restricted distribution of any pine in the world. Its long, coarse, gray-green needles are in fives, the cones are unarmed and bear seeds of large size. In cultivation several trees have grown to much larger size than any in the native stands. The largest one is at Carpinteria, but there are several fine trees in the San Francisco Bay area.

Weeping pine, *Pinus patula*, from Mexico is a

strikingly beautiful ornamental because of the pendant way in which it bears its long, slender, bright green needles which are in clusters of three. The largest specimens are at the Institute of Forest Genetics, but is increasing in favor and small trees are to be seen in many gardens.

Dwarf pine, *Pinus mugo*, from Europe, is widely used as a round-crowned, shrub-like ornamental, though it occasionally becomes ten to twelve feet high. Its short, dark green needles are two in a cluster and the cones are of miniature size to match the dwarf stature of the tree. It is often used at lawn borders with several types of prostrate junipers.

Chinese juniper, *Juniperus chinensis*, appears in several attractive forms from the slender, erect type which resembles Irish yew in habit to the prostrate form which creeps along the ground. An irregular and somewhat twisted form now coming into rather wide use in formal plantings is variety *torulosa*, commonly known as Hollywood juniper. Occasional trees of Tennessee red cedar, *Juniperus virginiana*, are seen in gardens, but the native California species—Sierra juniper of the high mountains, *J. occidentalis*, and California juniper of desert areas, *J. californica*—are almost unknown as ornamentals.

Colorado blue spruce, *Picea pungens*, from the southern Rockies, is the most widely used of any spruce, because of its hardiness, adaptability to many conditions, and the beauty of its silvery blue-green crown of stiff, sharp needles. Norway spruce, *Picea excelsa*, from Europe, and Oriental spruce, *P. orientalis*, from Asia, with very short, soft, dark green needles are occasionally used near the coast. Sitka spruce, *P. sitchensis*, the giant native species of the north California coast and Pacific Northwest, is rarely used as an ornamental.

Three Chinese conifers also deserve brief mention. Maidenhair tree, *Ginkgo biloba*, does well in many situations and is increasing in popularity with the development of narrow crowned forms. Its rounded, fern-like leaves turn golden-yellow before they are shed in the fall. Chinese fir, *Cunninghamia lanceolata*, has stout leaves resembling those of Bidwell araucaria, but softer to the touch, and pendant cones about two inches in diameter which are borne at the ends of twigs.

Good specimens are seen in many collections, including those at Capitol Park, Sacramento, and Golden Gate Park. A fine specimen stands just south of the entrance to the old Mission Santa Clara. Dawn redwood, *Metasequoia glyptostroboides*, can only be seen as small specimens because of its recent discovery and introduction. It is deciduous like its close relative the bald cypress, *Taxodium distichum*, and it closely resembles that species in leaf type. However those of dawn redwood are opposite in arrangement and its cones are smaller. Good nursery specimens may be seen at the Saratoga Horticultural Foundation, Saratoga, and a few specimens ten to fifteen feet in height are present in collections.

FIRS

To observe the native firs, *Abies*, of California, it is necessary to visit the mountains, as they are slow-growing and not widely used in ornamental plantings.

White fir, *Abies concolor*, is a large and widely distributed timber tree of the mountain forest belt where it associates with ponderosa and sugar pines, incense cedar, black and canyon live oaks and Sierra redwood. It is a symmetrical tree with long, silvery-green upturned needles, gray-brown, corky trunk bark and four-to five-inch green cones which are borne erect on the upper branches. It is a favorite Christmas tree and is now being experimentally planted for this purpose. A few very nice ornamental trees are occasionally seen in garden plantings.

Red fir, *Abies magnifica*, of the high mountain areas and its Shasta variety, are characterized by regularity of branch structure, plump needles which are blue-green, shorter and more upturned than those of white fir, and by the dark red color of its furrowed bark when cut into with axe or knife. The purple cones are larger and more barrel-shaped than those of white fir and the upper bark is smooth and silvery-gray in color which gives the name of "silver tip" to Christmas trees of this species. It is slow growing and very rarely seen in cultivation. There is one

typical tree about eighteen feet tall surrounded by a lawn at 1314 Euclid Avenue in Berkeley. There are small specimens in the East Bay Regional Park Botanic Garden.

Lowland white fir, *Abies grandis*, of the north coast country, carries its needles in two ranked, flat sprays. They are deep green and shiny above, and have white lines of pores beneath. It grows to large size in the forests of the north coast with redwood, Douglas fir and Sitka spruce, but is rarely planted as an ornamental or as a Christmas tree, though open grown trees should serve well for these purposes. There are good specimens at Santa Rosa, Berkeley and Golden Gate Park.

Santa Lucia fir, *Abies venusta*, is found naturally only in Monterey County on the crest of the Santa Lucia mountains. Its needles are very long with sharp points, green above with white lines of pores beneath. The cones are about four inches long and resemble a Medusa head because of the long, slender pointed bract on each cone scale. As a young tree this species has good shape and very attractive dense foliage but it is not often seen in cultivation. Several fine young trees are in the Botanic Garden of East Bay Regional Park and a symmetrical specimen about fifteen feet tall stands southwest of the Greek Theatre above Gayley Road on the Berkeley Campus of the University.

Nordmann fir, *Abies nordmanniana*, from southwest Europe, is a hardy and beautiful fir with dense, dark green foliage and a fine vigorous habit of growth. Good specimens are growing in parks and gardens in the Sacramento and San Joaquin valleys as well as along the coast.

Spanish fir, *Abies pinsapo*, from Spain, is also a hardy tree occasionally seen in gardens. Its stout and sharp needles come out all around the stout twigs which make it look more like a spruce than a fir. Its cones are slender, dark reddish-purple in color and borne near the top of the tree. There are good specimens at Roeding Park, Fresno, Golden Gate Park and occasionally in garden collections.

Other firs occasionally seen as ornamentals are European silver fir, *Abies alba* (*pectinata*), Greek fir, *Abies cephalonica*, Momi fir, *A. firma*, from Japan, and *Abies numidica* from North Africa.

BROADLEAVED EVERGREENS (Native)

Of the native broadleaved evergreen trees the oaks are perhaps the most widespread in distribution, and they are notable landscape features wherever they occur. They grow to great size and their broad spreading crowns of holly-like leaves, sturdy trunks and branches make them objects of notable beauty.

Coast live oak, *Quercus agrifolia*, graces the hillsides and canyons of the coast ranges from San Diego north to Mendocino County. Many fine specimens which in dry situations assume a shrublike form, may be seen along Highway 101. The leaves are rounded and spoon-shaped, convex upwards, and glossy green on both sides with tiny tufts of tan hairs in the axils of the veins beneath. The bark is in large, gray-green plates except on very old specimens.

Interior live oak, *Quercus wislizenii*, is a tree of the foothills, where it associates with the deciduous blue oak, digger pine, and several brush species. Its bark is dark and shallowly furrowed and the leaves are generally flat and have marginal teeth more widely spaced than those of the preceding species. Its stump sprouts vigorously when cut down or killed by fire.

Canyon live oak, *Quercus chrysolepis*, has the most dense and heavy wood of any oak, and specimens on the Angeles National Forest and Stanislaus National Forest have grown to larger size than any other oaks in America—slightly over eleven feet in diameter, breast high. The leaves of this fine tree are glossy green above, but coated with fine gray pubescence beneath. Some are very holly-like and others without marginal teeth, with most trees showing both types of leaves. The new growth and the turban-like cups of the acorns have a golden tinge from which the tree is also known as golden-cup oak. The bark is light gray-brown in color and finely divided into shallow vertical ridges. It is of considerable interest that the closely allied huckleberry oak, *Q. vaccinifolia*, of the high, granite ridges is a thicket forming shrub of miniature size. Fine spreading specimens of canyon live oak grow on the rocky ledges around Yosemite Valley, while thickets of the huckleberry oak are

common in the Lake Tahoe region.

Tanbark oak, *Lithocarpus densiflora*, is a large, upright evergreen species of the coast ranges where for many years it has been an important source of tannin for the leather industry. Its leaves and flowers are chestnut-like in appearance, but the fruit is a plump acorn deeply set in a fringed cup. Leaves, twigs and acorns are coated with a woolly tomentum. The tree sprouts vigorously when cut and many areas in the redwood region are coming up to dense stands of tanbark oak and madrone sprouts between the widely spaced sprout clusters from old redwood stumps.

Madrone, *Arbutus menziesii*, is one of the most beautiful of western trees. Its smooth bark is strikingly mottled in tones of green, red and tan. Its leaves are large, glossy green with dainty serrate margins. The tiny, cream-colored bell-shaped flowers are borne in dense clusters and later mature to form orange-red fruits of great beauty. Though most common in the coast ranges, this tree is occasionally met with in middle elevations in the Sierras.

California laurel, *Umbellularia californica*, called "Oregon myrtle" by our northern neighbors, is also widely distributed throughout the coast mountains and at intervals in the Sierra. Its dark green, leathery, taper-pointed leaves have smooth margins, and when crushed have a stinging pungent odor which gives the tree a common name "pepperwood." This tree sprouts vigorously and grows to very large size in favorable situations. Three notable specimens are (1) the Laurel of San Marcos in Santa Barbara County, (2) the Teel Laurel in San Lorenzo, Alameda County and (3) the Sink Ranch Laurel north of Cloverdale in Sonoma County. This species has wood which rivals that of canyon live oak in density and hardness.

California fremontia, *Fremontia californica*, is a small evergreen tree of the dry foothill country which is notable because of its large golden-yellow flowers which are borne in great quantities in summer. Its leaves are lobed and somewhat maple-like in shape, and so densely coated with hairs as to give the tree a local name of flannel bush. It is now rather widely used as an ornamental in gardens.

BROADLEAVED EVERGREENS (Exotic)

Trees native of Australia have been brought in greater variety to California than have those from any other part of the world. These trees have profoundly influenced the appearance of parks, gardens and the entire countryside of coastal and valley sections. Of these the genus *Eucalyptus* is by far the most important, and blue gum, *Eucalyptus globulus*, is now well-nigh universally planted throughout lowland sections. Its smooth greenish trunks from which the bark is shed in long shreds, long sickle-shaped leaves, warty, button-like capsules, bluish seedling and sprout foliage and the cloud-like out-



MANNA GUM,
Eucalyptus viminalis

line of its towering crowns are so widely present that many people believe it to be a native tree. It is estimated that more than two thousand miles of eucalyptus windbreaks have been planted to protect citrus groves in southern California from wind damage. Many plantations, groves and individual trees are met with as far north as Humboldt Bay along the coast. The tallest trees of blue gum, now slightly over 200 feet, stand in the west grove on the University of California campus at Berkeley. Individual trees with diameters between 80 and 100 inches are met with in a number of counties. Sutro Forest in San Francisco and Tilden Regional Park in the Berkeley Hills are notable examples of blue gum plantations.

Manna gum, *Eucalyptus viminalis*, also reaches great height and massive trunk diameter. It may be recognized by its slender drooping leaves, shoe-button like fruits which are borne in clusters of three, and its smooth, creamy-white bark. It is somewhat more frost resistant than the blue gum. One of the largest specimens is the McCubbin manna gum near Dinuba in Tulare County which was planted in 1889 near an irrigation ditch. It is now approximately 100 inches in diameter and nearly 150 feet in height. Other fine specimens are met with throughout the San Joaquin and Sacramento valleys and a very beautiful specimen stands beside the Napa Valley highway south of the town of Yountville.

Red ironbark, *Eucalyptus sideroxylon*, is notable for its coal-black trunk bark, blue-green foliage, and on many specimens for its masses of pink flowers which ripen into goblet-shaped capsules in drooping clusters of three. Good specimens are along Highway 101 at Santa Barbara and again near San Juan Bautista in San Benito County. A young highway planting may be seen along Highway 99 at Selma, Fresno County.

Red flowering eucalyptus, *E. ficifolia*, is perhaps the most spectacular of all locally grown species. Its leaves are broad, shiny and dark green and when in bloom they are nearly hidden by the masses of brilliant crimson flowers. These mature into capsules about the size and shape of the bowl of a smoking pipe and open to release large winged seeds. Fine specimens of this highly ornamental species are limited to milder sections as the tree is not very frost hardy.

Red gum, *E. rostrata* (*camaldulensis*), gray gum, *E. tereticornis*, and desert gum, *E. rudis*, are similar in appearance with mottled tan and green trunks, slender drooping leaves and small flowers and fruits borne in stalked umbels of five to fifteen. All are quite frost and drought-resistant and so are present in many interior and desert valley situations.

Lemon-scented gum, *E. citriodora*, is limited to southern California as it is easily damaged by frost. Its tall, smooth, silvery-white trunks and lemon-scented foliage give it unusual charm and interest.

Sugar gum, *E. corynocalyx* (*cladocalyx*), is another smooth-barked tree of beautiful tall form. The trunk is mottled tan and cream and the leathery leaves have a rounded shape and a beautiful reddish tinge to the new growth. The clustered fruits are small and quite barrel-like in shape. The tree is found mostly in nearly frost free areas of southern California, but it will stand considerable drought.

Red box, *E. polyanthemos*, has fibrous bark, rounded poplar-like leaves which are silvery-gray in color, and small white flowers borne in drooping terminal panicles. It is a good highway tree and the foliage is widely used in floral decorations.

These are the species most commonly met with in California, but many others may be seen in collections at Huntington Gardens, Santa Monica, and in Southern California parks.

About thirty trees of the genus *Acacia* have been introduced from Australia and several of them are in widespread use throughout coastal and southern California areas for the beauty of their fern-like compound leaves and brilliant golden bloom. Acacias grow easily from seed, make rapid growth, but are usually short-lived in cultivation. The following species are most commonly seen:

Black wattle, *Acacia decurrens mollis*, becomes a large tree with dark green foliage and masses of light yellow flowers.

Silver wattle, *Acacia decurrens dealbata*, is quite similar, but the finely compound leaves are silvery or gray-green in color and the flowers are darker yellow. Seed pods on both varieties are persistent for some time.

Bailey acacia, *Acacia baileyana*, is a smaller, spreading tree with similar fern-like foliage which has an attractive silvery, blue-green color. The deep golden flower clusters appear in early spring and are popular for floral decorations.

Blackwood acacia, *Acacia melanoxylon*, is a large and hardy tree in which the leaves are reduced to flattened, leathery leaf stems (*phyllodia*) with parallel veins. Its cream-colored, feathery flowers are not as showy as those of the above species, but the tree stands pruning well and has been widely used as a street tree in difficult situations.

Sydney golden wattle, *Acacia longifolia*, has leaves similar to those of blackwood but they are narrow and longer. As a spreading shrub or small tree this species is used in hedges and screen plantings. It has been extensively planted on the sand dunes adjacent to the beach in Golden Gate Park, San Francisco.

Silk oak, *Grevillea robusta*, is another hardy importation from Australia where its oak-like wood is used in furniture manufacture. Its leaves are irregularly compound and fern-like in appearance. Deep orange-colored flowers appear on horizontal stalks in late spring and summer. It is extensively used as a street and park tree in coastal and milder valley districts.

Orange pittosporum, *Pittosporum undulatum*, is one of the most popular small trees from Australia because of its glossy green leaves which have wavy margins and small white flowers with orange-like fragrance. The seeds of this and other pittosporums are embedded in a sticky, orange-colored gum or jelly. The tarata, *P. eugenioides*, is similar but the foliage is of lighter texture and more yellow-green in color and the bark is marked by prominent lenticels. It is from New Zealand.

Another interesting genus of ornamentals from Australia is *Melaleuca* which includes several species with narrow leaves, showy bottle-brush type flowers which are white, pink or red in color and spongy bark which is shed in tissue-like layers. One of the most common of these is the Cajuput tree, *Melaleuca leucadendron*, which becomes a medium-sized tree with very spongy light cream-colored bark. In all of these the seed pods remain attached to the stems for long periods.

Moreton Bay fig, *Ficus macrophylla*, is another remarkable species from Australia with large, glossy green leaves and small inedible fruits. It reaches such large size when fully grown as to be suitable only for parks or very spacious grounds. The massive tree at the Southern Pacific Station in Santa Barbara has a crown diameter of nearly 150 feet. There are somewhat smaller specimens in parks in Ventura and Los Angeles. The smaller rusty-leaf fig, *Ficus rubiginosa*, has leaves which are coated beneath with rusty hairs. There are several other evergreen species. The orchard fig is deciduous.

Australian brush cherry, *Eugenia myrtifolia*, belongs to the *Myrtaceae* family with the *Eucalypts* and *Melaleucas*. It is very popular as a street, garden, and hedge tree for its dense, glossy green leaves which have a dark reddish tinge when young. Its flowers are white and the pulpy fruits are shiny red-purple when ripe. The 76-foot specimen at Carpinteria High School has a branch spread of over 50 feet and is the largest *Eugenia* in California.

Bottle tree, *Sterculea diversifolia*, with its smooth trunk bark and bottle-like form is an Australian species widely used as a street tree in southern California. Its light green, glossy, pendant leaves are irregularly lobed or sometimes entire, and the small, bell-shaped greenish yellow flowers are attractively mottled with red. The heavy boat-shaped seed pods are an interesting feature in fall and winter and are used

as floral decorative materials. Other *sterculeas* have larger deciduous leaves and flame-colored flowers, but are less frequently seen than the bottle tree.

California pepper tree, *Schinus molle*, is of Peruvian origin, but has been so widely planted that it has acquired the California name. It is so hardy and drought resistant and it succeeds so well under a variety of conditions that it is now one of the most distinctive features of the California scene. Its large leaves are feathery compound, light green in color and weeping in habit of growth. Trunks on old trees are often irregularly and grotesquely fluted with light-brown, fibrous bark. Its branches are spreading, forming a round-topped crown of distinctive beauty. In winter the pendant clusters of tiny magenta-red berries give added beauty. Perhaps the most notable rows of pepper trees are those lining the broad Euclid Avenue near Upland in San Bernardino County.

Mayten tree, *Maytenus boaria*, from Chile, is a small but hardy species with light green, dainty, tapered leaves borne on gracefully pendant branches resembling weeping willow. The trunk bark is shallowly furrowed and dark in color while the flowers and fruits are inconspicuous. Moderate sized specimens are along the banks of Strawberry Creek on the campus in Berkeley. Fine trees are at each corner of the Quadrangle on the Davis campus of the University of California.

Camphor tree, *Cinnamomum camphora*, from Formosa and Japan, is extensively used as a street tree for the beauty of its light, yellow-green, pendant leaves which have the odor of camphor when crushed. It grows slowly and stands pruning well, is quite frost hardy in valley areas, and has few enemies. Notable specimens are to be seen at the Bidwell Mansion grounds at Chico and at the Ebell Club in Pomona, while fine rows of street trees are found in many California cities and towns.

The olive tree, *Olea europaea*, from the Mediterranean region is not only important for its fruit and olive oil, but is one of the hardiest and most satisfactory street and highway trees we have. It is small-to-medium sized and grows slowly. Its gray-green, narrow, oval leaves are resistant to wind, weather and insects. In spring the compact, rounded crown bears great masses



CAMPBOR,
Cinnamomum camphora



SIERRA REDWOOD,
Sequoia gigantea

of tiny white flowers which later ripen into the dark purple olives of commerce.

Another commercial orchard tree often grown as a distinctive ornamental is the avocado, *Persea americana*, from Central America. Its large, shiny green leaves and tall, rounded crown are features of many ornamental plantings. Many of these trees in warmer sections yield fine edible fruits. The tree is not frost hardy but some specimens persist in the San Francisco Bay region although they do not bear fruit. An avocado tree presented to the University of California from Guatemala in 1879 is still to be seen near the bank of Strawberry Creek on the Berkeley campus.

Cork oak, *Quercus suber*, from the Mediterranean area, has been planted as an ornamental in California since the 1850's. Its soft, fluted, corky bark and broad crown of holly-like leaves (which are dark green above and silvery beneath) are well-known features of many parks and gardens. There are fine street and highway plantings of cork oak in Pasadena, Chatsworth, Santa Barbara, Fresno and Davis. The largest tree is at Napa State Hospital where it has grown to a diameter of 60 inches since it was planted in 1873. Many fine young trees are now growing from extensive distribution of seedlings from 1942 to 1948.

The Holm oak, *Quercus ilex*, of Europe, is very similar in leaves and general habit of growth but it has tight, hard bark with no corky characteristics. It is a fine ornamental for streets, parks and gardens and is present in many collections including Roeding Park, Fresno, and parks in many cities. A good street planting of Holm oak may be seen on Oak Street in Whittier, Los Angeles County.

DECIDUOUS TREES (Native)

White alder, *Alnus rhombifolia*, grows along stream banks throughout the Sierra Nevada, South Coast ranges and southern California. Its leaves have finely toothed margins, sometimes nearly entire and not rolled under. The smooth, gray and somewhat mottled trunks, pendant catkins of tiny flowers before the leaves, and small woody cone-like fruits are attractive characteristics. It is now being planted quite frequently as an ornamental on irrigated lawns.

Red alder, *Alnus rubra*, is a larger tree found along coastal stream banks from the Santa Cruz Mountains to southern Alaska. Its leaves are larger than the preceding, have more deeply toothed margins which are definitely rolled under, and the woody fruits are also larger. Where stands of considerable volume occur on river bottoms, red alder is now being cut for furniture, boxes and crates. Second growth stands of considerable extent are coming up on cutover lands near the coast in Oregon and Washington.

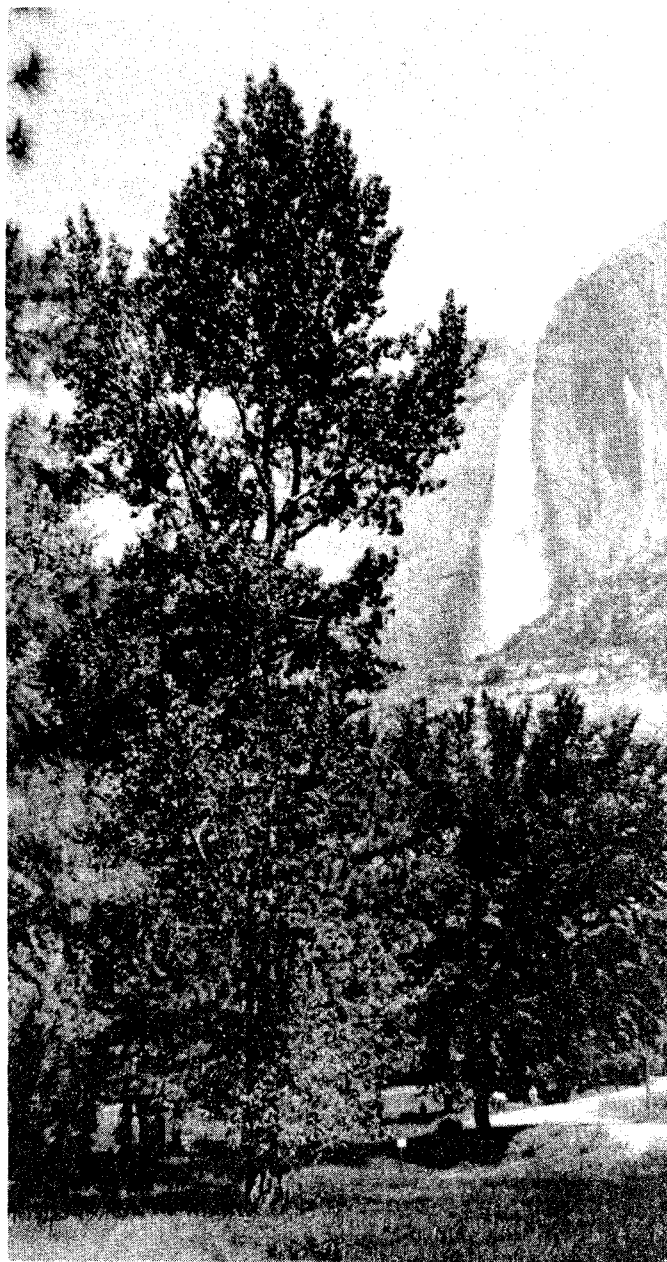
California sycamore, *Platanus racemosa*, is another common streamside tree of coastal, valley and foothill areas where its tan and green mottled trunks, often irregular habit of growth, large, deeply-lobed and woolly-coated leaves and pendant, globular fruits are objects of interest and beauty. In recent years it has been seriously defoliated by the sycamore canker disease and many trees have died. It is not often used as an ornamental being replaced by the somewhat hardier and more rapid growing hybrid London plane.

Fremont cottonwood, *Populus fremontii*, is a broad-spreading, flat-topped tree of valley stream bottoms and desert washes. Its thick delta-shaped leaves have coarse, incurved teeth on the margins. The tree grows rapidly and is frequently planted in irrigated sections of hot interior valleys for shade and shelter.

Black cottonwood, *Populus trichocarpa*, reaches the largest size of any cottonwood in the Pacific Northwest, but is found along stream banks and mountain valleys in both coast ranges and Sierra Nevada at higher elevations than the preceding. Its leaves are dark green above and have a silvery or golden-yellow tint beneath. The buds are long, pointed, and resinous. The seed capsules are hairy. It is rare as an ornamental.

Aspen, *Populus tremuloides*, with the most extensive distribution of any tree in North America, is widely distributed in California mountains above 6,000 feet, where its silvery trunks and trembling leaves which turn golden in the fall contribute greatly to the beauty of sub-alpine scenery. It is very rare in cultivation, but may be seen in the little artificial mountain meadow in the East Bay Regional Park Botanic Garden near Berkeley together with some other mountain

associates: the shrub mountain alder, *Alnus tenuifolia*, and the decorative mountain ash, *Sorbus sitchensis*, noted for its clusters of white flowers and magnificent clusters of scarlet berries. Here also are specimens of four shrub dogwoods and the two native small maples: vine maple, *Acer circinatum* and the Sierra maple, *Acer glabrum*.



BLACK COTTONWOOD,
Populus trichocarpa

Box elder, *Acer negundo*, is a moderate sized, short-lived tree with compound ash-like leaves, and stout, smooth greenish twigs which are coated with an ashy bloom and heavy clusters of narrowly winged, drooping samaras. It is widely distributed at low-to-moderate elevations along streams. It is occasionally used as a quick-growing tree for shade. Occasional trees with variegated leaves are seen.

Pacific dogwood, *Cornus nuttallii*, is one of the most beautiful of all native broad-leaved species. It is widely distributed as an understory in coastal and mountain forests where its bright display of white flowers in May and June and the brilliant red of its foliage in fall give color and brightness to usually somber coniferous timber stands. Many people visit Yosemite Valley and other mountain areas in order to enjoy the dogwood displays in spring and fall. It is difficult to grow and is rarely seen in cultivation.

California buckeye, *Aesculus californica*, is another strikingly beautiful flowering tree. It is a spreading tree which grows vigorously in full sunlight in brushy foothill areas of both coastal and interior mountains, rather than in the filtered sunlight in which dogwood does best. Its creamy white flowers are borne on erect spikes up to ten inches in length which give the trees an appearance like a great candelabra. The bright green leaves are palmately compound with usually five slender leaflets. They dry and fall from the tree in mid-summer leaving the smooth gray stems and twigs with the developing pear-shaped fruits to grow and ripen after they have fallen. These fruits later split open to release very large, shiny-brown seeds. The tree is easily propagated from seed. It is occasionally used as an ornamental in hot, dry valley and foothill areas where it requires little care.

California flowering ash, *Fraxinus dipetala*, is another small tree native in foothill brush areas which bears attractive clusters of feathery cream-colored flowers in spring, both on male and female trees. Its opposite, compound leaves are light green in color, but the leaflets are narrow and drooping so that the crown is thin in appearance. The tree is not used as an ornamental.

California redbud, *Cercis occidentalis*, occasionally reaches tree size, but is generally a spreading shrub which is widely distributed in foothill areas, where its dark, reddish-purple flowers, appearing before the leaves, are a beautiful sight each spring. Lake County holds an annual redbud festival when these are in full bloom in the brushy hills around Clear Lake. The light green leaves are almost round in outline. The flat seed pods have an attractive reddish color before they turn brown on ripening and usually remain clustered on the stems all winter.

Other attractive native flowering shrubs which may well be mentioned here are Douglas spiraea, *Spiraea douglasii*, with pendant white flowers. This tree is rarely cultivated but is of great beauty in mountains canyons.

Carpenteria, *C. californica*, has showy white flowers with yellow centers and is rather common in cultivation.

California storax or cream bell, *Styrax californica*, has fragrant, creamy white flowers. Specimens of all three are growing in the East Bay Regional Park Botanic Garden.

Oregon ash, *Fraxinus oregona*, is a medium-to-large tree of river banks and moist flats in the north coast ranges and northward in Oregon where it is of some importance as a timber tree. The compound leaves which are borne opposite on stout twigs have five-to-seven broadly rounded leaflets of light green. Its fruits are borne in pendant clusters and are the typical "canoe-paddle" type of other ashes. This tree is rare in cultivation.

Arizona ash, *Fraxinus velutina*, is a dry land ash, native in Arizona and southeast California. It has light gray-green, velvety, pubescent leaflets which are taper pointed. The small fruits are borne in drooping clusters. It has been widely planted as a street and highway tree in interior valleys but requires consistent spraying to prevent serious damage from the ash-tingid insect. Two smooth, shiny-leaved varieties of this tree known as "Modesto ash" and "Montebello ash" are now being extensively grown and planted as street trees and ornamentals. Both are rapid-growing. They are said to be more hardy than the other species.

Valley oak, or California white oak, *Quercus lobata*, is a large and stately tree of interior valley and foothill areas on deep fertile soils. Its typically lobed, white oak leaves are shiny green above and somewhat dull beneath. The large acorns set in shallow cups are long and taper-pointed. The branches of mature trees are massive in structure. The ultimate twigs on many specimens have a graceful, weeping habit. Fine specimens of this tree may be seen on good soils throughout the Sacramento and San Joaquin valleys, Napa, Sonoma and Santa Clara valleys and on well-watered bottom lands near streams to about 2500 feet elevation in the foothills. Notable specimens of great size and beauty are the "Sir Joseph Hooker Oak" in Bidwell Park,

Chico, the "Henley Oak" at Round Valley, Mendocino County, and the "Ward Oak" near Visalia, Tulare County. There are many fine trees near Paso Robles, San Jose, Walnut Creek, Santa Rosa, Stockton and Sacramento.

Oregon white oak, *Quercus garryana*, is very similar to valley oak but the leaves are somewhat broader and usually more deeply lobed and more yellow-tinged beneath, and the acorns are short and plump instead of long and pointed. This species ranges through the north coast ranges where on poor sites it appears in extensive shrub-like thickets less than ten feet high. In Oregon it reaches large size and is cut for lumber. In Washington and British Columbia it is the only native oak tree. It is rarely cultivated.



VALLEY OAK, *Quercus lobata*

Blue oak, *Quercus douglasii*, is named for the bluish color of its small, shallowly lobed leaves which are squarish in outline. Its acorns are set in very shallow cups, are plump and almost round in outline, and dark purple-brown in color. The tree is widely distributed throughout foothill woodland areas with associated brush species where its gray-white bark and bluish-green crowns are a pleasing contrast to the dark foliage and bark of interior live oak which is its most common associate. This tree has great possibilities as an ornamental for dry situations but is rarely seen in cultivation.

California black oak, *Quercus kelloggii*, becomes a large tree throughout the main Sierra timber belt at elevations of 4000 to 6500 feet where it grows with ponderosa and sugar pines, incense cedar, white fir and Sierra redwood. Its large, deeply lobed, shiny leaves are spiny-tipped and resemble those of red and black oaks of the East. The plump acorns which mature in two years are deeply set in a scaly cup and the trunk bark is deeply furrowed and dark gray-brown in color. It is rare in cultivation.

Northern California black walnut, *Juglans hindsii*, becomes a stately tree, quite similar in appearance to American black walnut, but the leaves are shorter and the leaflets smaller and the nuts have a smooth instead of a sculptured shell. This tree is widely planted as a street and highway tree in valley areas where it gives welcome shade. The southern California form, *J. californica*, is usually of shrubby form and is rarely used as an ornamental. Hybrids between both forms of native walnut and the English walnut, *J. regia*, are not uncommon and some of them have grown into stately and very beautiful trees.

DECIDUOUS TREES (Exotic)

Deciduous trees from many parts of the world have been brought to California during the past hundred years. There are occasional grown specimens in gardens or in arboretum plantings. Many trees from eastern America, Europe and the Mediterranean do well with irrigation during the dry season but are not mentioned in the following list as they are not generally cultivated.

London plane, *Platanus acerifolia*, is one of the most widely planted street and highway trees throughout much of California. Its leaves are bright green, broad and maple-like in shape and less woolly than those of the native sycamore. The ball-like multiple fruits are borne in pendant chains and the bark is mottled green and tan like the native species. The tree grows rapidly, stands pruning well and is less subject to damage by the sycamore canker disease.

Black locust, *Robinia pseudoacacia*, from the Middle West, was one of the earliest tree importations by the pioneers. Mature trees are present in virtually all of the old mining towns. Younger trees are common throughout valley and foothill areas. It is hardy under many conditions and is a favorite because of the beauty of its light-green compound leaves and the fragrance of its white, sweet-pea-like flowers. Its wood makes an excellent and long-lasting fence post. Its seed pods are flat and about two inches long. There is an excellent row of highway trees along U.S. 99 near Delhi on sandy land. Where moisture is sufficient, black locust frequently reseeds itself in grove-like stands.

Pagoda tree, *Sophora japonica*, has leaves similar to those of black locust, but without the stipular thorns. The pods are plump and constricted between the seeds and the tree is usually smaller than the locust. The tree, a native of Japan, is commonly planted in valley gardens. There is a good grove in Grace-Ada Park, Modesto, and in parks in Fresno and Sacramento.

Another legume family tree with large compound leaves with small leaflets and a graceful feathery appearance, is the silk tree or Constantinople acacia, *Albizia julibrissin*, from Iran and eastward. Its broad spreading and rounded crown is covered with pink flower clusters in midsummer. It does well in warm valleys and along the south coast where a specimen at Goleta has reached 35 feet in height.

The goldenrain tree, *Koeleruteria paniculata*, gets its name from the large drooping panicles of golden yellow flowers. It is of small size and has a graceful habit of growth. It has pinnately compound leaves in which the leaflets are broad, with serrate margins and, occasionally, doubly compound, at least in part. Seeds are

borne in inflated papery pods which appear in clusters and resemble little Chinese lanterns. It makes a handsome and interesting lawn specimen. It is from China and belongs to the *Sapindaceae* family.

The Chinaberry tree, *Melia azedarach*, came originally from the Himalayas, but has escaped from cultivation in the southwest and in California. One form known as Texas umbrella tree has a flat or rounded crown of very dense, dark green, feathery compound leaves, and masses of round, bead-like berries which cling on the tree through the winter after the leaves have fallen. This form, *umbraculiformis*, is widely planted for dooryard shade in hot interior valleys. The tall, open-grown form is less common.

The Chinese tree of Heaven, *Ailanthus altissima*, has escaped cultivation in California as it has in many other parts of the United States. It is recognized by the very long compound leaves with each tapered leaflet having a conspicuous gland near its broad base, and the great masses of winged seeds which are reddish in color in the early stages. It is commonly seen in and around the gold discovery spot at Coloma and in many of the old mining towns along the Mother Lode. Occasional trees reach large size, but more often they grow in dense thickets of small stems.

English or Persian walnut, *Juglans regia*, not only grows in thousands of acres of walnut orchards, but is widely used as a street and highway tree. Its light-green compound leaves have fewer and larger leaflets than the native walnuts. The bark is smooth and gray-green instead of rough and furrowed.

Another spectacularly beautiful ornamental tree from China with light-green, dainty, compound leaves and dense clusters of tiny red and green colored fruits is the Chinese pistache, *Pistacia chinensis*. The foliage is brilliant in the fall with varying shades of pink-to-scarlet. The tree is hardy under a variety of conditions. There are good specimens at Roeding Park, Fresno and on the campus at Berkeley, and a fine row of highway trees between Chico and Durham along U.S. 99-E. A notable collection of this and other species of Pistache is to be seen on the grounds of the USDA Plant Introduction Garden near Chico where selection and hybridi-

zation experiments are in progress.

Sweet gum, *Liquidambar styraciflua*, from the Mississippi Valley is rare in older plantings but is becoming increasingly popular as a street and lawn tree. It has a fine erect habit of growth, is hardy under a variety of soil and moisture conditions and does not grow too rapidly. The lobed, star-shaped leaves are dark, lustrous green and change to various shades of red, pink and orange in the fall. The corky wings on twigs and smaller branches and the pendant, ball-like multiple fruits are interesting marks of identification.

Tulip tree, *Liriodendron tulipifera*, is another southeastern tree that becomes a fine ornamental in California on good soils and with adequate care and irrigation. Its broadly lobed leaves are depressed at their tips. The flowers are greenish-tan in color like little tulips and develop into erect multiple fruits from which the winged seeds are gradually shed during fall and winter months. There are good trees on the campus at Berkeley, at Capitol Park, Sacramento, and at the Institute of Forest Genetics at Placerville.

Crape myrtle, *Lagerstroemia indica*, from Asia is a notable small tree because of its profusion of white, pink or lavender flowers which bloom during summer or early fall, and for its smooth, tan-colored bark which appears almost like sandpapered wood. It blooms best in interior valleys but is occasionally planted in coastal areas.

Pink-flowering buckeye, *Aesculus carnea*, a hybrid form, is similar to European horse-chestnut which is only occasionally planted in California. The pink form is now popular in street plantings where it is hardy and where its pink or red blooms give a pleasing note of color in late spring.

English hawthorne, *Crataegus oxycantha*, is another hardy ornamental widely used for its white or pink flowers which are followed by ornamental red berries in the fall. Its deeply lobed leaves are dainty in outline and fine in texture. Many other shrubs and small trees of the rose family are planted as garden and street trees. These include crabapples, Japanese flowering cherries and the purple-leaved flowering plum, *Prunus pissardi*, which is very common as a small street tree.

ELMS

Several of the larger species of elm are common in older park and street plantings. Although they have grown to stately trees, they are rarely used now because of their size. These include American and cork elms from the Middle West, and English and Dutch elms from Europe. The fine street trees in Sacramento, Berkeley, Stockton, Chico and many other cities are admired and much appreciated for their towering form and their welcome shade. In recent years two smaller elm species from Asia have been widely planted because of their hardiness and rapidity of growth.

Siberian elm, *Ulmus pumila*, survives under many difficult and dry conditions. It makes quick shade in hot valleys where few other trees will persist. Under irrigation it grows so fast that it often breaks down during winds and should be pruned to moderate size. It has gray-brown furrowed bark, leaves of moderate size and leafy fruits which ripen in late spring as the leaves are maturing.

Chinese elm, *Ulmus parvifolia*, has smaller and shinier leaves and smooth trunk bark which is attractively mottled in shades of green and tan. It grows more slowly than the preceding and in south coastal areas retains most of its leaves throughout the winter. Its small leafy fruits ripen in the fall. In desert sections they turn red and remain on the tree as an attractive winter feature. As a lawn tree it may be trained to a flat or rounded crown with gracefully pendant branches. Both species may be seen along State Highway 99 north of Bakersfield. Siberian elm is one of the commonest trees in new subdivision plantings. Many finely formed trees of Chinese elm are to be seen in Pasadena, Los Angeles and other southern California cities and towns.

OAKS

Deciduous oaks from many parts of the world are growing as individual specimens in gardens, but only a few species are extensively cultivated and no attempt has been made to grow a collection of oaks in arboretum form. The "Civil War Battlefield Grove" at Capitol Park, Sacramento, includes a few eastern oaks not seen elsewhere.

Northern red oak, *Quercus rubra* (*borealis*) has made excellent growth as a street tree in

several cities of the central coast area, and there are good garden trees at Chico and at the Institute of Forest Genetics, Placerville. A good specimen on the Berkeley campus is admired for its broad, shiny green leaves with short, pointed lobes, and the smooth, gray-green bark of trunk and limbs.

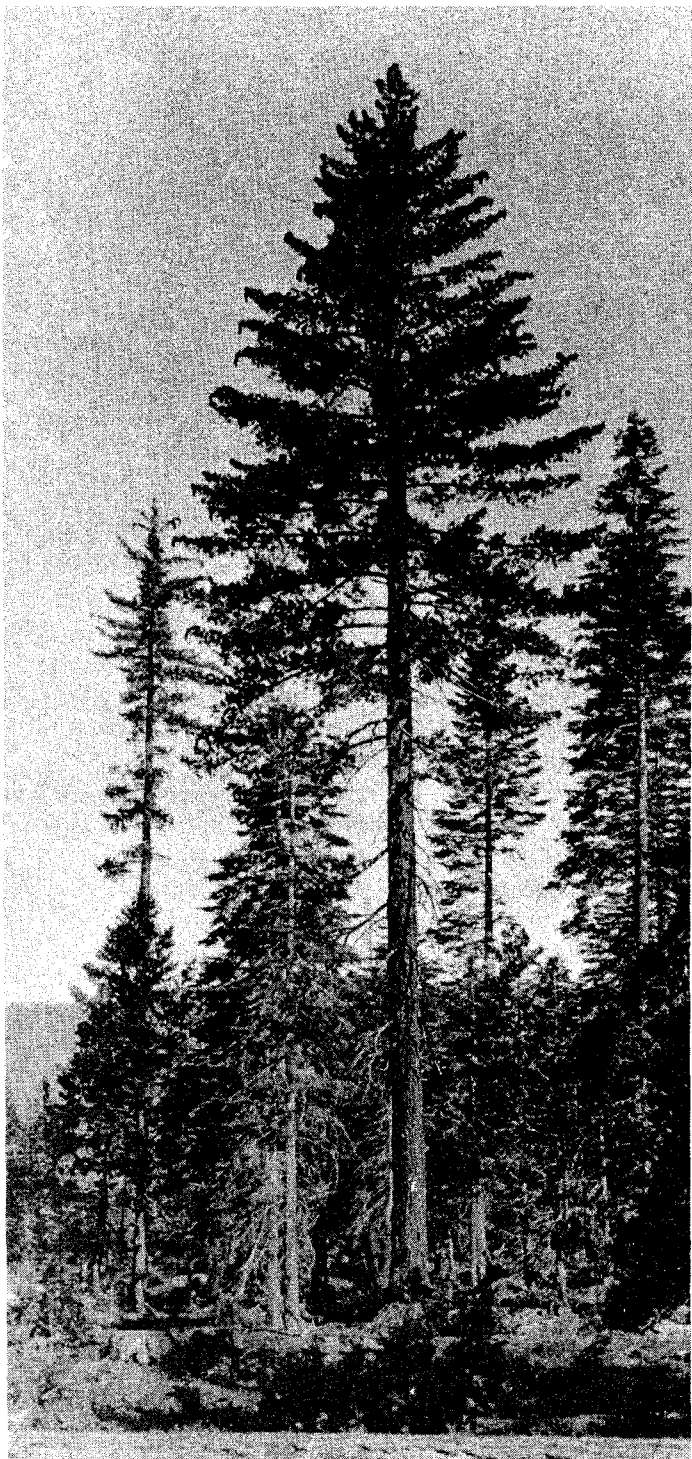
Scarlet oak, *Quercus coccinea*, often displays as beautiful fall coloration in California as in its native middle western surroundings. A very fine tree is near the north side of Roeding Park, Fresno and another stands beside Highway 99-E at the north edge of Yuba City.

Pin oak, *Quercus palustris*, is coming into greater use as a street and highway tree for its sturdy, upright habit of growth with short "pin-like" lower branches and for the dainty beauty of its deeply lobed, shiny leaves. The finest pin oaks in California are along the south walk in Fuller Park, Napa. There is a good planting along Highway 99 near Lodi and a number of fine young trees in McKinley Park, Sacramento.

English oak, *Quercus robur*, like many trees from Europe, does very well in California. It becomes a noble tree with dark, furrowed bark, broadly rounded crown of lobed, dark green leaves borne on sturdy, wide-spreading branches. Some trees have reached large size and one of the finest is at the Marin Art and Garden Center in the town of Ross. Good specimens are at Bidwell Park, Chico, in gardens on the San Francisco peninsula, and at Santa Barbara.

Turkey oak, *Quercus cerris*, from Turkey and the Caucasus, is quite similar to English oak, but the leaves are somewhat narrower and the acorns are deeply set in a fringed cup. A very fine specimen stands beside the sunken garden on the University of California campus at Davis.

Bur oak, *Quercus macrocarpa*, of the Middle West, has demonstrated its ability to grow well in many parts of California, both along the coast and in the interior. Its leaves are broad at the tip, tapered at the base and distinguished by a deep central lobe extending almost to the midrib. The large acorns are borne in a mossy cup and many of the twigs are marked by corky ridges. A very fine specimen of this eastern tree stands on the Patterson Ranch home grounds near Newark, Alameda County. There are also good trees at the old Chico Forestry Station.



SUGAR PINE,
Pinus lambertiana

MAPLES

Broadleaf or bigleaf maple, *Acer macrophyllum*, has the largest leaves of any maple. They are borne on very long petioles, are bright green and deeply lobed. The attractive pendant flower clusters appear before the leaves in spring and develop by midsummer into broad winged samaras which have stout, sharp hairs over the seeds. On deep bottomland soils this maple becomes a large, round-crowned tree of attractive habit which is occasionally seen in gardens and as a street and highway tree.

Silver maple, *Acer saccharinum*, has been almost as commonly planted as a street and highway tree in California as in its native middle western country, although its smooth gray bark is sometimes subject to sunburn in valley locations. There are fine rows of street trees in valley towns from Bakersfield to Red Bluff where the shade cast by its rounded crowns of deeply cut, light green and silvery leaves is very welcome on hot days.

Sugar maple, *Acer saccharum*, does not succeed well in valley sections, but some excellent trees are to be seen along the coast and in towns along the Mother Lode Highway. Two fine specimens are along Strawberry Creek north of the Life Sciences Building on the Berkeley Campus. The row of street trees north of Placer County Court House in Auburn displays fall colors which rival those typical of this fine timber tree in the Lake States and New England.

Japanese maple, *Acer palmatum*, is a small tree from Japan which appears in a number of dainty garden forms, some with leaves so deeply cut that the crown has a light and feathery appearance. Some vary in color from light green to deep-crimson and they are popular in many formal garden plantings.

Three European maples—Norway maple, *Acer platanoides*, sycamore maple, *Acer pseudoplatanus*, and field maple, *Acer campestre*—are occasionally seen in garden plantings and sometimes in foothill towns as street trees. Some parks display good trees of purple-leaved forms of the Norway or sycamore maples. Specimens of the entire-leaved Himalayan maple, *Acer oblongum*, may be seen at Franceschi Park, Santa Barbara and on the campus at Berkeley.

POPLARS

Lombardy poplar, *Populus nigra italica*, from southern Europe, is as widely planted throughout California as in most temperate zones of the world. Its narrow, upright form is seen nearly everywhere in towns east and west of the mountains. In open valley areas, rows of these trees appear like a succession of exclamation points against the distant hills.

Common cottonwood, *Populus deltoides*, and forms which are undoubtedly hybrids between this and other poplars, grow to large size in irrigated valleys, but are difficult of exact identification.

Silver poplar, *Populus alba*, from Europe and Asia is also quite common in dooryard and garden plantings. It sprouts vigorously from the roots and so often appears in clumps along fence rows. Its leaves are maple-like in outline and so woolly-white beneath that the tree is often called white poplar. A similar but larger and more erect tree is occasionally seen in foothill areas where it has made remarkably rapid growth. It is from Asia and is called *Populus tomentosa*.

European white birch, *Betula alba*, is in widespread use as an ornamental on lawns and occasionally along streets. The forms with weeping branches and deeply cut leaves are especially popular. The gracefully pendant flower clusters appearing before the leaves in spring, the white papery bark, and the tiny cone-like multiple fruits all add to its popularity. American white birch, or canoe birch, *Betula papyrifera*, has larger leaves and a sturdy, erect form. It becomes a much larger tree, but is less frequent in cultivation. There is a fine specimen north of the Library on the Berkeley campus of the University of California.

Two broad-leaved flowering trees belonging to the Bignonia family are commonly used as garden specimens and occasionally as street trees. The hardy *Catalpa speciosa*, from the Middle West, has white flower clusters and long cigar-like seed pods. The Empress tree from East Asia, *Paulownia tomentosa*, has blue or purplish flower clusters and shorter and more plump seed pods. The catalpa is more common throughout valley sections.

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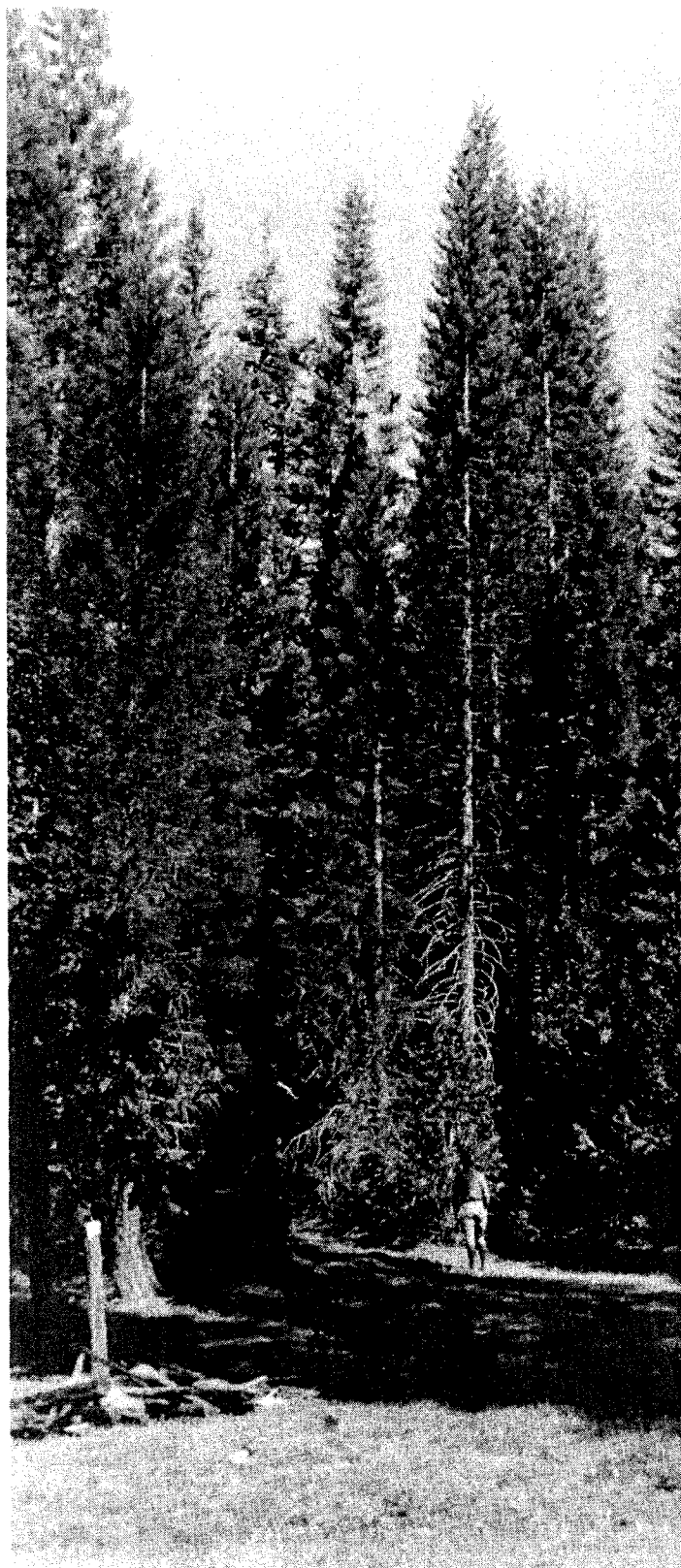
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ABBREVIATIONS USED:

B.....	Broadleaved evergreen
C.....	Conifer
D.....	Deciduous
E.....	Exotic to California
N.....	Native to California
P.....	Palm

<i>Abies concolor</i> C.N.	
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<i>Abies grandis</i> C.N.	
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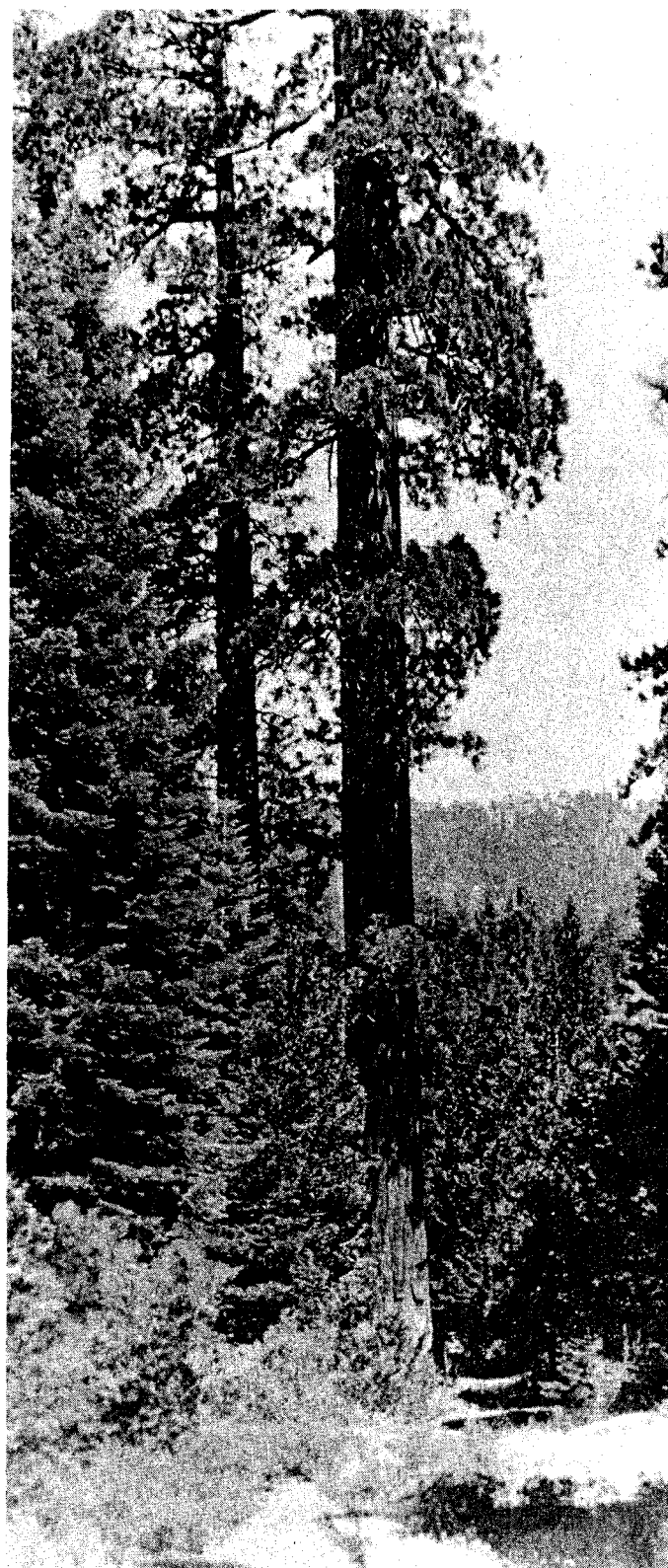
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<i>Juniperus occidentalis</i> C.N.	
Sierra juniper	10
<i>Juniperus virginiana</i> C.E.	
Tennessee red cedar	10
<i>Koeleruteria paniculata</i> D.E.	
Goldenrain tree	20
<i>Lagerstroemia indica</i> D.E.	

Crape myrtle	21
Laurel, California, or Oregon Myrtle B.N.	
<i>Umbellularia californica</i>	4, 12
<i>Libocedrus decurrens</i> C.N.	
Incense cedar	3, 8
<i>Liquidambar styraciflua</i> D.E.	
Sweet gum	21
<i>Liriodendron tulipifera</i> D.E.	
Tulip tree	21
<i>Lithocarpus densiflora</i> B.N.	
Tanbark oak or Tan oak	4
Locust, Black D.E.	
<i>Robinia pseudoacacia</i>	20
Madrone B.N.	
<i>Arbutus menziesii</i>	12
Maidenhair Tree C.E.D.	
<i>Ginkgo biloba</i>	10
Maple, Bigleaf or Broadleaf D.N.	
<i>Acer macrophyllum</i>	4, 23
Maple, Field D.E.	
<i>Acer campestre</i>	23
Maple, Himalayan D.E.	
<i>Acer oblongum</i>	23
Maple, Japanese D.E.	
<i>Acer palmatum</i>	23
Maple, Norway D.E.	
<i>Acer platanoides</i>	23
Maple, Sierra D.N.	
<i>Acer glabrum</i>	17
Maple, Silver D.E.	
<i>Acer saccharinum</i>	23
Maple, Sugar D.E.	
<i>Acer saccharum</i>	23
Maple, Sycamore D.E.	
<i>Acer pseudoplatanus</i>	23
Maple, Vine D.N.	
<i>Acer circinatum</i>	17
Mayten Tree B.E.	
<i>Maytenus boaria</i> , Chile	15
<i>Maytenus boaria</i> B.E.	
Mayten Tree, Chile	15
<i>Melaleuca leucadendron</i> B.E.	
Cajeput tree	14
<i>Melia azedarach</i> D.E.	
Chinaberry tree	21
(Also var. <i>umbraculiformis</i> , Texas umbrella tree)	21
Mesquite, Common B.N.	
<i>Prosopis juliflora</i>	6
Mesquite Screwpod B.N.	
<i>Prosopis pubescens</i>	6
<i>Metasequoia glyptostroboides</i> C.E.D.	

Dawn redwood	11
Monkey Puzzle (Araucaria) C.E.	
<i>Araucaria imbricata</i>	7
Myrtle, Crape D.E.	
<i>Lagerstroemia indica</i>	21
Oak, Silk B.E.	
<i>Grevillea robusta</i>	14
Oak, Tanbark B.N.	
<i>Lithocarpus densiflora</i>	4
Oak, Blue D.N.	
<i>Quercus douglasii</i>	4, 20
Oak, Bur D.E.	
<i>Quercus macrocarpa</i>	22
Oak, California Black D.N.	
<i>Quercus kelloggii</i>	3, 20
Oak, Coast Live B.N.	
<i>Quercus agrifolia</i>	3, 4, 12
Oak, Cork B.E.	
<i>Quercus suber</i>	16
Oak, English D.E.	
<i>Quercus robur</i>	22
Oak, Holm or Holly Oak B.E.	
<i>Quercus ilex</i>	16
Oak, Huckleberry B.N.	
<i>Quercus vaccinifolia</i>	12
Oak, Interior Live or Highland B.N.	
<i>Quercus wislizenii</i>	4, 12
Oak, Maul, Golden Cup, or Canyon Live B.N.	
<i>Quercus chrysolepis</i>	3, 12
Oak, Northern Red D.E.	
<i>Quercus rubra (borealis)</i>	22
Oak, Oregon White or Pacific Post D.N.	
<i>Quercus garreyana</i>	19
Oak, Pin D.E.	
<i>Quercus palustris</i>	22
Oak, Scarlet D.E.	
<i>Quercus coccinea</i>	22
Oak, Turkey D.E.	
<i>Quercus cerris</i>	22
Oak, Valley or Valley White D.N.	
<i>Quercus lobata</i>	3, 19
<i>Olea europaea</i> B.E.	
Olive	15
Olive B.E.	
<i>Olea europaea</i>	15
Orange Pittosporum B.E.	
<i>Pittosporum undulatum</i>	14
Pagoda Tree D.E.	
<i>Sophora japonica</i>	20
Palm, Plume P.E.	
<i>Cocos plumosa</i>	6
Palm, Canary Island P.E.	

<i>Phoenix canariensis</i>	6
Palm, Date P.E.	
<i>Phoenix dactylifera</i>	6
Palm, Windmill P.E.	
<i>Trachycarpus excelsa</i>	6
Palm, California Fan or	
Washington Palm P.N.	
<i>Washington filifera</i>	6
Palm, Mexican P.E.	
<i>Washington robusta</i>	6
Paloverde, Blue D.N.	
<i>Cercidium floridum</i>	6
<i>Parkinsonia aculeata</i> D.E.	
Jerusalem Thorn or Paloverde	6
<i>Paulownia tomentosa</i> D.E.	
Empress tree	24
Pepper, California B.E.	
<i>Schinus molle</i>	15
<i>Persea americana</i> B.E.	
Avocado	16
<i>Phoenix canariensis</i> P.E.	
Canary Island palm	6
<i>Phoenix dactylifera</i> P.E.	
Date palm	6
<i>Picea excelsa (abies)</i> C.E.	
Norway spruce	10
<i>Picea orientalis</i> C.E.	
Oriental spruce	10
<i>Picea pungens</i> C.E.	
Colorado blue spruce	10
<i>Picea sitchensis</i> C.N.	
Sitka spruce	3, 10
Pine, Captain Cook's C.E.	
<i>Araucaria cookii</i>	7
Pine, Norfolk Island (Araucaria) C.E.	
<i>Araucaria excelsa</i>	7
Pine, Aleppo C.E.	
<i>Pinus halepensis</i>	10
Pine, Bishop C.N.	
<i>Pinus muricata</i>	3
Pine, Canary Island C.E.	
<i>Pinus canariensis</i>	9
Pine, Coulter or Big Cone C.N.	
<i>Pinus coulteri</i>	10
Pine, Digger C.N.	
<i>Pinus sabiniana</i>	4
Pine, Dwarf C.E.	
<i>Pinus mugo</i>	10
Pine, Italian Stone C.E.	
<i>Pinus pinea</i>	10
Pine, Jeffrey C.N.	
<i>Pinus jeffreyi</i>	3

Pine, Lodgepole, Tamarack Pine, or Tamarack C.N.	
<i>Pinus contorta latifolia</i> (<i>Pinus murrayana</i>).....	5
Pine, Maritime C.E.	
<i>Pinus pinaster</i>	10
Pine, Mexican Weeping C.E.	
<i>Pinus patula</i>	10
Pine, Monterey C.N.	
<i>Pinus radiata</i>	3
Pine, Ponderosa or Western Yellow C.N.	
<i>Pinus ponderosa</i>	3
Pine, Sugar C.N.	
<i>Pinus lambertiana</i>	3
Pine, Torrey C.N.	
<i>Pinus torreyana</i>	10
Pine, Western White or Silver C.N.	
<i>Pinus monticola</i>	5
<i>Pinus canariensis</i> C.E.	
Canary Island pine.....	9
<i>Pinus contorta</i> var. <i>latifolia</i> C.N.	
Lodgepole pine or Tamarack pine.....	5
<i>Pinus coulteri</i> C.N.	
Coulter pine.....	10
<i>Pinus halepensis</i> C.E.	
Aleppo pine.....	10
<i>Pinus jeffreyi</i> C.N.	
Jeffrey pine.....	3
<i>Pinus lambertiana</i> C.N.	
Sugar pine.....	3
<i>Pinus monticola</i> C.N.	
Western white pine, Silver pine, or Idaho white pine.....	5
<i>Pinus mugho</i> C.E.	
Dwarf pine.....	10
<i>Pinus muricata</i> C.N.	
Bishop pine, or California swamp pine.....	3
<i>Pinus patula</i> C.E.	
Mexican weeping pine.....	10
<i>Pinus pinaster</i> C.E.	
Maritime pine.....	10
<i>Pinus pinea</i> C.E.	
Italian stone pine.....	10
<i>Pinus ponderosa</i> C.N.	
Ponderosa pine or Western yellow pine.....	3
<i>Pinus sabiniana</i> C.N.	
Digger pine.....	4
<i>Pinus torreyana</i> C.N.	
Torrey pine.....	10
Pistache, Chinese D.E.	
<i>Pistacia chinensis</i>	21
<i>Pistacia chinensis</i> D.E.	
Chinese pistache.....	21

<i>Pittosporum eugenioides</i> B.E.	
Tarata.....	14
<i>Pittosporum undulatum</i> B.E.	
Orange pittosporum.....	14
Plane, London D.E.	
<i>Platanus acerifolia</i>	5, 20
<i>Platanus acerifolia</i> D.E.	
London plane or Hybrid sycamore.....	5, 20
<i>Platanus racemosa</i> D.N.	
California sycamore.....	4, 17
Plum, Flowering D.E.	
<i>Prunus pissardi</i>	21
Poplar, Chinese white D.E.	
<i>Populus tomentosa</i>	24
Poplar, Lombardy D.E.	
<i>Populus nigra italica</i>	24
Poplar, Silver D.E.	
<i>Populus alba</i>	24
<i>Populus alba</i> D.E.	
Silver poplar.....	24
<i>Populus deltoides</i> D.E.	
Cottonwood.....	24
<i>Populus fremontii</i> D.N.	
Fremont cottonwood or Valley cottonwood.....	5, 17
<i>Populus nigra italica</i> D.E.	
Lombardy poplar.....	24
<i>Populus tomentosa</i> D.E.	
Chinese white poplar.....	24
<i>Populus tremuloides</i> D.N.	
Aspen or Quaking aspen.....	5, 17
<i>Populus trichocarpa</i> D.N.	
Western black cottonwood.....	5, 17
<i>Prosopis juliflora</i> or <i>chilensis</i> B.N.	
Common mesquite.....	6
<i>Prosopis pubescens</i> B.N.	
Screwpod mesquite.....	6
<i>Prunus pissardi</i> D.E.	
Flowering plum.....	21
<i>Pseudotsuga taxifolia</i> C.N.	
Douglas fir.....	3
<i>Quercus agrifolia</i> B.N.	
Coast live oak or California live oak.....	4, 12
<i>Quercus cerris</i> D.E.	
Turkey oak.....	22
<i>Quercus chrysolepsis</i> B.N.	
Canyon live oak.....	3, 12
<i>Quercus coccinea</i> D.E.	
Scarlet oak.....	22
<i>Quercus douglasii</i> D.N.	
Blue oak.....	4, 20
<i>Quercus garreyana</i> D.N.	
Oregon white oak or Pacific Post oak.....	19

<i>Quercus ilex</i> B.E.		
Holm oak or Holly oak.....	16	
<i>Quercus kelloggii</i> D.N.		
California black oak.....	3, 20	
<i>Quercus lobata</i> D.N.		
Valley oak or Valley white oak.....	3, 19	
<i>Quercus macrocarpa</i> D.E.		
Bur oak.....	22	
<i>Quercus palustris</i> D.E.		
Pin oak.....	22	
<i>Quercus robur</i> D.E.		
English oak.....	22	
<i>Quercus rubra (borealis)</i> D.E.		
Northern red oak.....	22	
<i>Quercus suber</i> B.E.		
Cork oak.....	16	
<i>Quercus vaccinifolia</i> B.N.		
Huckleberry oak.....	12	
<i>Quercus wislizenii</i> B.N.		
Interior live oak or Highland live oak.....	4, 12	
Redbud, California D.N.		
<i>Cercis occidentalis</i>	18	
Redwood, Dawn C.E.D.		
<i>Metasequoia glyptostroiboides</i>	11	
Redwood, Coast C.N.		
<i>Sequoia sempervirens</i>	3	
Redwood, Sierra C.N.		
<i>Sequoia gigantea</i>	3	
<i>Robinia pseudoacacia</i> D.E.		
Black locust.....	20	
Sawara, Plume C.E.		
<i>Cryptomeria japonica elegans</i>	9	
<i>Schinus molle</i> B.E.		
California pepper.....	15	
<i>Sequoia gigantea</i> C.N.		
Sierra redwood.....	3	
<i>Sequoia sempervirens</i> C.N.		
Coast redwood.....	3	
Silk Tree or Constantinople Acacia D.E.		
<i>Albizia julibrissin</i>	20	
Smoke Tree or Smoke Thorn D.N.		
<i>Dalea spinosa</i>	6	
<i>Sophora japonica</i> D.E.		
Pagoda tree.....	20	
<i>Sorbus sitchensis</i> D.N.		
Western mountain ash.....	17	
<i>Spiraea douglasii</i> D.N.		
Douglas spiraea.....	18	
Spruce, Colorado Blue C.E.		
<i>Picea pungens</i>	10	
Spruce, Norway C.E.		
<i>Picea excelsa (abies)</i>	10	
Spruce, Oriental C.E.		
<i>Picea orientalis</i>	10	
Spruce, Sitka C.N.		
<i>Picea sitchensis</i>	3, 10	
<i>Sterculea diversifolia</i> B.E. (<i>Brachychiton</i> <i>populneum</i>) Bottle tree.....	15	
<i>Styrax Californica</i> D.N.		
California storax.....	18	
Sugi, Japanese C.E.		
<i>Cryptomeria japonica</i>	9	
Sycamore, California or Western D.N.		
<i>Platanus racemosa</i>	4, 17	
Tarata B.E.		
<i>Pittosporum eugenoides</i>	14	
<i>Taxodium distichum</i> C.E.D.		
Bald cypress.....	11	
<i>Thuja orientalis</i> C.E.		
Oriental arborvitae.....	8	
<i>Thuja plicata</i> C.N.		
Western red cedar or Giant arborvitae.....	3	
<i>Trachycarpus excelsa</i> P.E.		
Windmill palm.....	6	
Tree of Heaven, Chinese D.E.		
<i>Ailanthus altissima</i>	21	
<i>Tsuga heterophylla</i> C.N.		
Western hemlock.....	3	
<i>Tsuga mertensiana</i> C.N.		
Black hemlock or Mountain hemlock.....	5	
Tulip tree D.E.		
<i>Liriodendron tulipifera</i>	22	
<i>Ulmus parvifolia</i> D.E.		
Chinese elm.....	22	
<i>Ulmus pumila</i> D.E.		
Siberian elm.....	22	
<i>Umbellularia californica</i> B.N.		
California laurel, Oregon myrtle or pepperwood.....	4, 12	
Walnut, English or Persian D.E.		
<i>Juglans regia</i>	20, 21	
Walnut, Northern California Black or Hinds Walnut D.N. <i>Juglans hindsii</i>	20	
Walnut, Southern California Black D.N. <i>Juglans californica</i>	20	
<i>Washingtonia filifera</i> P.N.		
California fan palm.....	6	
<i>Washingtonia robusta</i> P.E.		
Mexican Washington palm.....	6	
Wattles (Acacias) B.E.		
Black Wattle <i>Acacia decurrens mollis</i>	14	
Silver Wattle <i>Acacia decurrens dealbata</i>	14	
Sydney Golden Wattle <i>Acacia longifolia</i>	14	
Willow, Desert D.N.		
<i>Chilopsis linearis</i>	6	
<i>Yucca brevifolia</i> N.		
Joshua tree or Tree yucca.....	6	