

PLANT PORTRAITS

SEQUIADENDRON — "The Biggest Living Thing on Earth"

Leonid Enari

ONE of the sequoidendrons in Sequoia National Park has dimensions which have earned it the title, "The Biggest Living Thing on Earth." The tree is the General Sherman. Its age is believed to be between 3,000 and 4,000 years and there is no sign of senility.

Dimensions of the General Sherman

Height	272.4 ft.
Circumference at base	101.6 ft.
Diameter at base	36.3 ft.
Diameter at 60 ft. above ground	17.5 ft.
Diameter at 120 ft. above ground ..	17 ft.
Diameter at 180 ft. above ground	14 ft.
Height to first larger branch	129 ft.
Diameter of largest branch	6.8 ft.
Volume of trunk	50,010 cu. ft.
Weight of trunk	625 tons
Weight of tree	1,000 tons (est.)

There are trees of other species that are taller and older than the General Sherman, but there is nothing as mighty as this tree.

Sequoiadendrons, also known as giant sequoias, big trees, or the Sierra redwoods, grow in more or less isolated groves on the western slopes of the Sierra Nevada in Central California. Most of these groves are at elevations between



The General Sherman

4,400 and 7,500 ft., although some occur as low as 3,000 ft. and a few as high as 8,900 ft. The best stands grow in protected locations where the average annual precipitation is from 45 to 60 inches and where the precipitation occurs in the form of snow during September to May. The temperature occasionally drops to -12 F and seldom exceeds 100F. Sequoiadendrons do not form pure stands, except in small groves, but are associated with other trees among which sugar pines, ponderosa pines, white firs, incense cedars, and California black oaks are most common.

The first sequoiadendron stands are believed to have been discovered by members of the Joseph Walker exploration party which came upon the Merced and Tolumne groves in 1833. The groves now belong to the Yosemite National Park. The largest sequoiadendron forest, however, remained unknown until 1858 when Hale Tharp, a settler, was guided by the Indians to the grove which in 1875 was named by John Muir, "The Giant Forest," and which in 1890 became the Sequoia National Park. It was here that Tharp built a summer cabin in a fire-hollowed sequoiadendron log which he occupied for many seasons and where he entertained John Muir in 1879. Tharp's log today is a popular attraction for park visitors.

The age limit of sequoiadendrons is unknown because there is no record of one dying of old age. It is certain that they live 4,000 years, reasonably certain that they can live 5,000 or 6,000 years, and probable that they may live even 7,000 or 8,000 years if protected in national parks. There is a record of a felled sequoiadendron that had 3,126 annual rings, and John Muir reported one tree stump in Converse Basin that was 4,000 years old. The age of the biggest standing sequoiadendrons, however, can only be estimated because the coring instru-



A sequoiadendron at the Arboretum.

ments used to determine the age of lesser trees will not penetrate to the heart of these giants.

Sequoias never die on their feet, they fall. The tremendous weight of the mature tree makes it sensitive to any change in the stability of the ground on which it stands. It has no tap root. Its massive but shallow roots are brittle and without great strength. It is kept erect by the balance resulting from equal distribution of weight upon the base. If ground conditions change, for example, by stream erosion cutting away the soil from one side of a tree, or the soil being softened by changes in underground drainage—the balance of the tree is threatened. Once a tree loses its balance it cannot be restored. Loss of balance is usually followed by an increasing degree of tilting until finally the tree, its roots unable to hold, crashes to earth. It usually happens when the ground is wet from melting snow. Occasional winds may provide the final push. The falling of the tree opens up the ground so that the seedlings can establish themselves, and a new generation comes into being.

Sequoiadendrons produce cones and seed, after reaching maturity, in great numbers. It is estimated that a mature tree produces about 2,000 cones per year, each single cone containing 100 to 300 seeds.

The seeds are very light, about 91,000 per pound on average, and may be carried for great distances by air currents. The greatest distance that wind will carry the seeds is not known although a case has been reported of seed being carried 580 feet.

The seedlings usually become established only on disturbed soil or on ashes in burnt-over area. Only very few seedlings are found in groves where the litter is high and dry. Although records are not available, probably only one seed in a million germinates under natural condi-

tions and only a small percentage of these survive.

Sequoiadendrons have no dangerous enemies, except fire. A single fire can destroy seedlings and saplings but not mature trees protected by 1- to 3-foot thick fire-resistant bark. Many fires are needed to seriously damage these trees. It is believed that practically every old tree has been subject to fire not less than once every twenty-five years prior to protection by national park status. Thus, a tree three thousand years old may have withstood a hundred or more fires. However, some trees have been killed by repeated fires, as evidenced by the black monuments presiding over their descendants in several groves.

Botanically, this species was included in the genus *Sequoia* until 1939 when John T. Buchholz, an American botanist, suggested that it belongs to a different genus he named *Sequoiadendron*. He then transferred it to the new genus as *Sequoiadendron giganteum*. (Lindl.) Buchh.

Sequoiadendrons can be seen at the Los Angeles State and County Arboretum in quadrat 08 (south of the Coach Barn, close to the road) where two specimens grow side by side. They originate from seed Dr. Russell Seibert, former director of the Arboretum, collected in the Yosemite National Park in 1951. The trees were planted in their present location in February 1954, and are now more than 23 years old. Their almost perfect pyramidal slope suggests they would make a perfect outdoor Christmas tree.

Standing in the front of these trees one may wonder how long they will last here. Will they live 3,500 years as has the General Sherman? Will they become as mighty? Will they grow as tall? Only time will tell. Sequoiadendrons can also be found at Descanso Gardens in La Canada and at South Coast Botanical Garden in Rolling Hills.



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