

The Eucalyptus Crusade

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The mere outline of a eucalyptus tree against the horizon serves to identify California to the rest of America, because our state almost alone has the tree, and we have it in fantastic abundance. It is easy to forget that Southern California, now so well clothed with eucalyptus, was once almost barren of any kind of a tree. No forests grew here; only tangles of willows along the stream beds, sycamores in the deepest canyons, and live oaks on the moist side of a few coastal hills. A single isolated stand of Torrey pine thrived in the dampness of the southern coastline, and a ragged clump of native palms struggled in a hidden canyon near Palm Springs. The rest of the arid land accommodated only chaparral, cactus, and wild mustard.

The Franciscan missionaries were the first to rebel against the absence of trees. They brought pepper trees from Spain to shade the Mission courtyards, imported fruit trees, and encouraged the olive to grow on their irrigated lands. The natives of Los Angeles were slower to plant trees, because the only water available to the pueblo ran from the Los Angeles River in narrow, weed-grown ditches, or was carried to the householder in a barrel on a donkey cart. As late as 1840, the pueblo could boast only two large trees, a lofty and wide-branching pepper tree in front of a Mexican adobe north of the Plaza, and a giant sycamore in front of the winery of Don Luis Vignes on Aliso Street. When a flagpole was needed in 1850 to furl the first United States flag over Los Angeles, it was necessary to send a crew of Indians to the pine forests of the San Bernardino Mountains to drag back two pine trunks.

In 1855, the School Trustees of Los Angeles bought a dozen or more black locust trees at "eight bits each" and had them planted on the school grounds. The schoolmaster watered them so faithfully from the school barrel that the water carrier protested to the Trustees about the waste of water. In the ensuing controversy, only a few of the locust trees were saved, the only trees growing on city land. The old Plaza and the vacant area then known as Central Park, now as Pershing Square, were bare of trees until 1870. Meanwhile, the drastic need for firewood was reducing the scant supply of willows, sycamores, and oaks, and was even destroying the peppers and olives in the abandoned Mission gardens.

Eventually, the ranchers introduced walnut trees by importing seeds, brought almonds from the Mediterranean, and chestnut seeds from Bourdeaux, France. It became a delightful custom in the pueblo to share a small packet of imported seeds with friends and neighbors, and then to compete for the best stand of the foreign trees. Large fruit orchards were finally cultivated successfully on the River bank, or in nearby areas where the water of small streams could be impounded for irrigation. Home gardens began to display exotic trees brought by sailing vessels from far-away lands. The welcome shade of trees was deepening in the settled communities, but the vast empty plains and the rounded hills were still sunburnt and sterile, waiting for the eucalyptus crusade.

The crusade started in a small way in San Francisco immediately after the gold rush, when Dr. H. H. Behr, a native of Germany and a pupil of Alexander Humboldt, began to talk about the importation of eucalyptus and acacia from Australia. He may have sent away for the seeds. At any rate, by 1853, there were fourteen species of eucalyptus growing in the garden of a Mr. Walker, of San Francisco. Hayward had a large planting in 1856, and in 1860, Stephen Nolan, a nurseryman of Oakland, had seedlings ready to

sell to the public. In Southern California, William Wolfskill planted eucalyptus on his Santa Anita rancho sometime after 1859. A cluster of five trees was still standing there when Harris Newmark bought the ranch in 1873.

The very name "eucalyptus" was a curiosity to the people of California. The combination of two Greek words, suggested by the formation of the seed pods, might be translated, "I conceal well," or "well hidden." The tree itself, an evergreen, with smooth bark, long graceful branches, and blue-green foliage, was an even greater curiosity. Single seedlings were planted experimentally in home gardens all over the state, with high hopes for ornamentation and shade.

For a dozen years, the planting of eucalyptus continued to be sporadic and experimental, until a modest educator, president and principal of the small, private Santa Barbara College, started a crusade with his plea that a barren state be converted into a continuous forest of eucalyptus trees. Ellwood Cooper had seen eucalyptus trees in San Francisco when he first arrived from the East, and he determined to plant some on his Dos Pueblos ranch, twelve miles west of Santa Barbara. Taking advantage of previous acquaintance with Thomas Adamson, Jr., United States Consul-general at Melbourne, Australia, Cooper wrote to ask how to obtain some eucalyptus seed. He also asked about books on the cultivation of the tree, because he could find none in America. Mr. Adamson sent the seeds and reported that Baron Ferd von Mueller, a botanist stationed in Melbourne by the British government, had delivered some lectures on the subject. The lectures had been printed, but the copies had all been sent to the government in London. However, Baron von Mueller would send his one precious original to Mr. Cooper, provided Mr. Cooper would have it published in America and give the Baron fifty copies.

By this devious and thoroughly academic process, Ellwood Cooper got his seeds, read all about their culture, and began to plant. His first trees were three years old, and the little College which his three children attended, and where he had accepted leadership responsibility, was five years old in 1875. When the officers of the College asked their president to be the speaker at a benefit to raise money for the college library, Ellwood Cooper fused his two absorbing interests into a lecture entitled, "Forest Culture and Australian Gum Trees."

Although Cooper had read all of Baron von Mueller's hyperbole about the eucalyptus as a money-making proposition, and although he did stimulate his audience gently with visions of income from trees, yet his heart was obviously in the more æsthetic and patriotic aspects of eucalyptus culture. He decried the wanton destruction of the forests in the eastern part of America and in Europe, and pled for their replacement by the planting of new forests of eucalyptus trees in California.

The preservation of forests is one of the first interests of society, and consequently one of the first duties of government. All the wants of life are closely related to their preservation; agriculture, architecture, and almost all the industries seek therein their aliment and resources, which nothing could replace. . . . Their existence is of itself of incalculable benefit to the countries that possess them, as well in the protection and feeding of the springs and rivers, as in their prevention against the washing away of the soil upon mountains, and in the healthful influence which they exert upon the atmosphere.

He promised his listeners joy in the planting. "It may be questioned whether, in the whole range of rural occupations, one more interesting presents itself than the superintendence of a growing wood, presenting to the eye at every season new objects of interest and solicitude. Where is the planter who would wish the workmanship of his hands undone, and who does not look with honest pride on the beautiful creation which, in a generous spirit, he has raised up around him?"

Ellwood Cooper could speak with authority on the gratifications of the planter, because he now had 50,000 eucalyptus growing at Ellwood, his home ranch. Some were on steep hillsides, some on level ground. Some were cultivated, some not. Some had irrigation, some had none. Every species was identified, and the rate of growth of each recorded. He could tell his audience that a tree grows to forty-five feet in three years from seed, with a diameter of nine and a half inches; that young trees reach six feet in five months. He could explain exactly how to propagate the seeds and how to transplant into the open ground, "as easily as setting out cabbage plants." Most persuasive of all, he could describe an acre of land planted with trees six feet by seven feet apart, one thousand trees on the acre. At the end of five years the planter takes out three fourths of the trees and sells them for 700 fence posts and fifty cords of firewood. The remaining trees become so valuable at the end of fifty years as to return 100% on the investment. "What we have therefore to do, as individuals, is to begin at once to plant. It is an obligation we owe to the possessory title to land; and financially we will be amply rewarded for our labors."

President Cooper's address to the little group in Santa Barbara stirred up so much interest that he was persuaded to publish his material. In his little book of 1876, he fulfilled his promise to Baron von Mueller by including a large section of the Baron's writings: his definition of species; his discussion of industrial uses; his description of the Australian eucalyptus. The book devoted a chapter to a listing of twenty varieties of eucalyptus available from the plant catalogue of Anderson Hall & Co., of Sidney, Australia, and at the very end of the book, as if by accident, there was inserted the Fifth Annual Catalogue of the Santa Barbara College.

With the naive mixture of patriotism and acquisitiveness which Ellwood Cooper had inspired, Southern California began to plant. At least, as good citizens, the planters would be serving their community, even if they never made money on fence posts or cord wood, and even if their eucalyptus trees were never used, as were those in Australia, for ships, bridges, piers, railroad ties, telegraph poles, wagons, furniture or any of the other hardwood objects that Cooper had enumerated. The nurserymen took advantage of the crusade spirit, collected seeds locally, and supplied seedlings in abundance. Cooper had recommended windbreaks planted at right angles with the prevailing direction of the wind, and windbreaks were planted. Cooper wanted the highways lined with trees, closely planted and two or three rows deep, and the inspired land holders edged their property with belts of little seedlings and watered them carefully for the first year. As they watched the trees grow, they came to agree with Cooper, "In its juvenile period, it is a finished type of elegance. In its adult period, it is a magnificent representation of strength."

When the State Legislature created the Board of Horticulture in 1883, Ellwood Cooper was made a member, without salary. He was still on the Board twenty years later when it was converted into a Commission. For four years more he served on the Commission. Of course, he carefully tended his eucalyptus grove at home while he carried his crusade into the state arena. In December, 1885, his good friend in Santa Barbara, Judge Charles Fernald, also an officer of the Santa Barbara College, joined the eucalyptus campaign by supplying seeds of a new species to horticultural societies and other agencies interested in forestry. The letter that went out with his little packets of seeds indicates the amateur character that still marked the eucalyptus crusade:

"I have received very recently from Mrs. Charles Hutton of Bath, England, a small package of the seed of the "Jarvah," the giant eucalyptus of West Australia, forwarded by the Manager of one of the estates of that lady in the last mentioned place. I desire

to distribute this seed as widely as possible throughout California, especially to the members of the various Horticultural Societies and to those who take an interest in 'American Forestry,' trusting that the noble and valuable tree may, in time, become acclimated and thrive here.

"I therefore take pleasure in sending herewith a small portion of the seed to you, which I beg you will accept, and distribute in such a manner as you may deem wise and proper for the accomplishment of the purpose above named.

"It has occurred to me to recommend the setting of young trees, if the seed should grow, in as many different soils, localities, and exposures as possible, until the habit of the tree shall be better known."

With good luck, Judge Fernald's seeds could probably have planted the entire state, because there are over 10,000 eucalyptus seeds in a single ounce. But the hazards in planting are many. A large proportion of the early seeds from Australia were sterile, this despite the fact that a fertile seed remains fertile for as long as six years, until it is moistened in a seed bed. More serious for Judge Fernald's dream of spreading the new species, correctly known as "Jarrah," was the fact that seeds from Australia were seldom true to name. Gathered by the natives in the Australian bush, the seeds might represent any one of the 150 species of the genus, or might be a mixture of many species.

Moreover, conditions of planting differed widely with the different species. Some required moist soil with the water table near the surface. Others could thrive on dry soil if they were exposed to ocean fog. No variety could tolerate frost in its early years, although some mature trees could withstand temperatures slightly below freezing. Excessive heat was fatal to some species, of little danger to others. Some grew easily in solitude, whereas they did not survive if planted closely in a grove. Some could be harvested early and would sprout again, other would not. Each species reacted so violently to its soil and temperature environment as to produce quite a different tree in each environment, some resembling neither their brothers in California nor their ancestors in Australia.

The resultant confusion in identifying species and in determining the special conditions for planting each, resulted in many failures with the seedlings and in growing discouragement with the idea of trying new varieties. The most generally successful species was the *Eucalyptus globulus* or "blue gum." Although it was not the tallest, nor the best for timber, it was the fastest growing; it would thrive easily under average conditions; it produced effective windbreaks and spectacular corridors along the streets and highways. It could be "cropped" every five years for fire wood and would sprout again for a new cropping. It would even seed itself, if the wind should blow its seeds into a hospitable spot. With the blue gum, then, in possession of the field, the crusade gathered momentum.

Patriotic school children planted blue gum on Arbor Day, especially in the north. The Presidio, Sutro Forest, Mount Davidson, and other public areas were planted almost wholly by school children. On a hot November day in 1886, 3,000 public-spirited citizens went by boat to Yerba Buena Island to plant blue gum while the First Infantry Band played background music, and such distinguished men as Mayor Sutro, Joaquin Miller, and General Mariano Vallejo gave them encouragement. The University of California campus in Berkeley was planted by a group of enthusiastic neighbors.

The Forest Grove Association was formed in Los Angeles in 1875, seeking "to convert the barren horizons into both beauty and profit by planting eucalyptus trees on a large scale." This group was interested in the experimental planting at "Santa Monica Heights," now Riviera Heights, and in converting Sullivan Canyon into a eucalyptus forest. The State Forestry Bureau built an experiment station in Santa Monica and, under the management of W. S. Lyon, Forester of the Bureau, tried many different species.

Closely associated with the Forestry Bureau, and its Chairman from 1886-1888, was a new apostle in the crusade, Mr. Abbott Kinney, better known as the founder of Venice and Ocean Park. While road master of Santa Monica in 1876, he had planted the streets of Santa Monica, the highways leading to the city, and his own home gardens in Santa Monica and in the San Gabriel Valley, with many different varieties of eucalyptus. As State Forester, he distributed seeds and seedlings throughout the state without charge, asking only that records be kept of their adaptation. He lectured widely, pleading for more intelligent utilization of the many diverse species of eucalyptus. Finally, in 1895, he published a monograph on the subject, describing again the different species and the special growing conditions and uses of each, wishing to "make the knowledge of the eucalyptus accessible to the largest possible number of inquirers."

To prove that variety in species is possible in California, Kinney gave the location of sample trees of fifty-one species, urging that these successful plantings be visited and reproduced in other areas. In addition to the value of certain species for timber, he stressed the use of other species for medicinal oil; tannin; kino or red rosin for insecticides and astringents; nectar for honey bees; paper pulp; bark for mats; moth balls; nest linings to control the lice; scouring material for encrusted boilers. Above all, he emphasized the ability of the eucalyptus tree to "draw water" and thus drain swampy land and reduce the incidence of malaria.

Mr. Kinney's enthusiastic but disorganized book is of value today chiefly for its precise location of the large plantations of 1895, and of the occasional trees of note in private gardens and on public streets. Almost invariably he found a good specimen of every species in the twenty-three-year-old planting of Ellwood Cooper in Santa Barbara.

But a more urgent incentive than Mr. Kinney's enthusiasm was necessary to keep the crusade rolling, and this incentive was provided in 1904 when the Forest Service of the U. S. Department of Agriculture announced that the supply of eastern hardwood would be exhausted in about sixteen years. As a result of the increasing scarcity and the rising price of oak, hickory, ash, walnut, maple, and mahogany, manufacturers of hardwood goods began to look for a substitute. Tests with Australian eucalyptus showed this hardwood to be the equal, if not the superior, of the accustomed eastern woods.

Here was a new and urgent reason for planting groves of Australian eucalyptus in California. A plantation set out immediately would be ready for cutting just as the eastern hardwood went off the market. The Panama Canal would be completed then, and lumber from California could be shipped at low cost all over the world. The eager planters studied again the list of species, decided which would produce the best hardwood for commercial use, and planted feverishly.

At least fifty nurserymen swung into action with seedlings; newspapers and periodicals carried encouraging and instructive articles; new industries were organized to process the timber and to make use of its by-products. A one-time Assistant State Forester, Mr. C. H. Sellers, published a book of "authentic data" for the guidance of the commercial planters. Its title was *Eucalyptus, Its History, Growth and Utilization*. Utilization was the key word in the treatise. The book was studded with testimonial letters from furniture makers, flooring firms, agricultural implement houses, dry dock builders, and other users of hardwood, all describing eucalyptus wood as excellent for their purposes. By-products were listed, with conjectures as to profit: some dozen medicinal and cosmetic products made from the distillation of the oil and resin (one Santa Monica firm distilled nine tons of eucalyptol a year); souvenirs such as pipe bowls and canes made from the highly polished wood; tannin, in vigorous use for tanning leather; a superior grade of charcoal; paper veneer; paper pulp; bee nectar, paving blocks.

For several years, tree planting became a commercial obsession. The Santa Fe Railroad planted a giant grove at what is now Rancho Santa Fe, and put in thousands of trees along their right-of-ways so that railroad ties could be cut at the spot needed. Furniture manufacturers bought land in California and planted it heavily. The Pullman Company planned to finish the interiors of their cars with the beautiful grain of the eucalyptus, and planted accordingly. Jack London planted 100,000 trees on the slope of Sonoma Mountain. Forty square miles of trees were set out south of Pismo Beach, between Highway 101 and the beach. Good agricultural land was ripped up for the planting of trees, which promised to be a more profitable crop than grain or beans. A coal mining company planted a grove on good land in Compton, expecting to produce strong timbers for shoring up the mine shafts.

Meanwhile, owners of some of the mature groves started to take their timber to market. The first difficulties they encountered seemed trivial and easy to overcome. The trees had to be sawed immediately after cutting, or the wood became too hard to work. Perhaps the wood was cut at the wrong time of the year—would it be easier to work if it was cut while the sap was flowing, or while the sap was not flowing? And should the lumber be cured in the sun, or in a kiln? Should the kiln use dry heat or steam heat? Everyone worked vainly to solve these "trivial" problems, but little by little it became painfully obvious that the problems were not trivial. Whenever cut, or however cured, the lumber was not satisfactory. It warped, twisted, checked, and even opened into huge cracks. A Nevada railroad reported that its railroad ties were perfect in every particular but one—not enough solid wood could be found between cracks for the insertion of bolts.

What was the difference between the Australian eucalyptus that had long been successful in the hardwood market, and the California eucalyptus of the same species? Remembering the wide limits of variation of a given species under different growing conditions, there could be a dozen answers. Possibly the superiority of the Australian trees was just a matter of age, but the California planters could not wait until their trees were a hundred years old to see if their timber had improved.

Sadly, the lumber mills shut down and the furniture factories moved back East. The planters counted their losses and figured how much they could salvage by cutting down entire groves for firewood. The pharmacologists withdrew their endorsement of eucalyptol as a valuable drug, and the cold cream, cough drop, and liniment factories closed. Only a few products retained the eucalyptol ingredient. Orchardists removed the eucalypts from their lines of fruit trees, because the surface roots of the shade tree stole water from the fruit. City maintenance crews cut down eucalyptus trees because their roots would go as far as a hundred feet in search of water, breaking water pipes and cisterns. As they grew tall, the shallow-rooted trees were apt to blow over on the city streets and their brittle branches sometimes dropped on pedestrians. The blue gum became anathema to subdividers, who began to specify in their deeds that no blue gum could ever be planted on any lot in the subdivision. Nurserymen still had eucalyptus seedling for sale, but, rather than blue gum, they were now smaller varieties, designed for ornamentation and for shelter from wind and sun. In preference even to these, the nurserymen recommended the new favorites, jacaranda and magnolia, which would take up less room in a land where there was no longer room to spare.

The crusade had come full cycle, back to its modest beginning in the home garden where one tree was enough. But in the forty years since Ellwood Cooper sounded the clarion call, the crusade had clothed a major portion of California with forest, relieving the monotony of the bare hillsides and uncultivated wastes. The great trees rose tall and stately on every hand. What matter if individual dreams of profit were disappointed? The State has been beautified, and that was the beginning dream of the crusade.

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Growing Cymbidiums in a Shade Garden

ERNEST HETHERINGTON

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PART I Cymbidium orchids are grown throughout the world in temperate areas such as Southern California. The native species came from the mountains of northern India and adjacent areas. These cool-growing terrestrials (plants that grow in soil) put out a great amount of growth each year, compared to other orchids. Cymbidiums will stand considerable summer heat, though they must be given cool nights during late August, September, and October to make them flower. This condition occurs naturally in southern California. You may grow cymbidiums in sheltered areas in your garden if they are protected from frost. Southern, western or eastern exposures are best. A lath-house, saran screen house, or filtered light area under a lightly leaved tree is good. If you are in an especially hot, dry area, pots may be plunged in sawdust to half their depth, with additional bark or sawdust mounded up around the pot to retain moisture. In relatively frost free areas, cymbidiums can be grown directly in the ground in shady locations, though you get best results in containers.

In California and similar mild areas, cymbidiums may be grown out-of-doors and will withstand down to 28°F. without serious damage. If you are in an area where temperatures go below freezing in winter, a glassed-in porch, greenhouse or a cool, bright room is fine, provided the minimum night temperature is not too high. 50°F. to 60°F. minimum is best. Buds may drop if the temperature is kept over 60°F. at night. Polyethelene plastic film makes an excellent temporary winter cover where moderate frost protection is needed.

To be Continued Next Issue



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