

## THE REDWOOD

What Forestry Can do for This Noble Tree  
—Bulletin From Bureau of

### Forestry

Forestry and irrigation are two enterprises in which the Adam Smith theory of laissez faire does not hold good. The private owner of a forest does not, following his selfish instincts, act in such a manner as to insure to the benefit of society in all cases. The whole future good is ruthlessly sacrificed for the sake of immediate returns. But one cannot blame the private owner. He cannot be expected to be any more far-sighted or benevolent than other individuals.

Forestry is a proper matter to be conducted publicly for the good of the whole people. A private capitalist cannot wait for "the long run;" he is looking after the "now." He cannot wait thirty, fifty, a hundred years to reap his harvest. Society can. Right now any further extension of the private ownership of timber lands should cease. They should remain public property—whatever remnant may be left.

A bulletin from the bureau of forestry contains an interesting account of the redwood, well worth the perusal of independent readers:

What is to be done for the Redwoods of the Pacific coast is a question that has not only agitated California, but is of sentimental concern to the whole nation. The bureau of forestry, attacking the problem in a thoroughly practical spirit, has worked out conclusions that should appeal as reasonable at once to the lumbermen, who cut redwood on account of its commercial value, and to those who wish this ancient and marvelous type of tree growth preserved.

The results of this study are given in "The Redwood," bulletin 38 of this bureau, by R. T. Fisher, recently issued by the department.

The Redwood forests are, in point of merchantable yield, probably the densest on earth, many stands yielding 150,000 board feet to the acre; and redwood logging represents the highest development of the lumbering business that has ever been attained on the Pacific coast. The total supply of redwood is estimated to be 75 billion feet. The amount cut in 1900 was 360 million feet, with a value of \$3,445,608. Although only one-tenth of the forests of the United States is owned by lumbermen, according to the last census, one-fifth of the redwood is in their hands, and the stands they own are the handsomest and most valuable in the Redwood belt.

Ever since the Spaniards began to cut redwood along San Francisco Bay the range of its growth has been diminishing; it now occupies an area of about 2,000 square miles. During the last 50 years several hundred thousand acres of timber have been cut over, and the good lands put into cultivation or turned into pasture. As year by year the Redwood forests have dwindled, it has come to be pretty generally believed that the tree is doomed to extinction.

This popular idea that the redwood has no chance of survival is not well founded. The studies of the bureau of forestry have proved that possibilities of a new growth of redwood after the old trees have been removed are excellent. Given half a chance, the redwood reproduces itself by sprouts with astonishing vigor. Measurements taken by the bureau on cut-over land show that in thirty years, on a fair soil and a dense stand, trees will be grown 16 inches in diameter, 80 feet high, yielding 2,000 feet board measure to the acre.

With the knowledge that the Redwood as a type need not become extinct, it is possible to consider the impending fate of the giant redwoods in the old forests with a more cheerful mind. Occasional parks and recreation grounds, such as the Big Basin Redwood Park of the Santa Cruz mountains, may preserve small areas of virgin redwood lands; but the richest, the densest, the most beautiful of the forests are owned by lumbermen, and will inevitably be cut. The trees represent invested capital; they are merchantable and will yield a profit now, small as it is. Besides, in the virgin stands most of them are past maturity, and the growth put on is inconsiderable. Every consideration, then, induces the redwood lumberman, reasoning from his standpoint, to cut his trees.

Realizing that the fate of the old trees cannot be stayed, the bureau of forestry, instead of wasting itself in attempts to check the cutting, confined itself to proving that it is worth while to the lumbermen to do less damage to the young trees in logging

virgin redwood lands, and to hold such lands for a second crop. The study made concerns itself with young second growth, rather than with mature trees; with timbered areas rather than with the virgin forest. Where attention was given the old forests and methods of lumbering, it was only that a better knowledge might be gained of second growth and how to deal with it.

The bureau's is the first systematic study of the redwood ever undertaken by a forester, and it has made clear several points about the life and habits of the tree that are little known.

The redwood of California belongs to a genus of which the Big Tree is the only other species now alive. Both are allied to the cypress, and their lumber is often called by the same name, but they are botanically distinct from each other. They do not even occupy the same situations. The Big Tree occurs in scattered bodies on the west slopes of the Sierra Nevada, while the redwood forms dense forests on the west slopes of the Coast Range. The redwood is popularly thought to occupy a strip of country 10 to 30 miles wide, from the Oregon line to the Bay of Monterey; but these boundaries do not cover its actual distribution. Two thousand acres of redwood, in two separate groups, are growing in Oregon along the Chetco river. South of the Chetco a continuous redwood belt begins. By way of the river valleys and lowlands it increases its width from 10 miles at Del Norte county to 18 or 20 miles and keeps on unbroken to southern Humboldt county. Here, for about a township, it thins out, but becomes dense again 6 miles north of the Mendocino line, and after entering that country widens to 35 miles, its greatest width. The redwood belt ends in Mendocino county, but isolated forests of the species are growing in Creek canyon in the Santa Lucia mountains, Monterey county, 12 miles south of Punta Gordo and 500 miles from the northern limit of the tree along the Chetco river.

The redwood grows to a greater height than any other American tree, but in girth and in age it is exceeded by the Big Tree of the Sierras. On the slopes 225 feet is about its maximum height and 10 feet its greatest diameter, while on the flats, under better conditions, it grows to be 350 feet high with a diameter of 20 feet. Most of the redwood cut is from 40 to 800 years old. After the tree has passed the age of 500 years it usually begins to die down from the top and to fall off in growth. The oldest redwood found during the bureau's investigation had begun life 1,373 years ago.

The bark of the tree offers such a remarkable resistance to fire that except under great heat it is not combustible. It is of a reddish-gray color, fibrous in texture and gives to full-grown redwoods a fluted appearance. Moisture available for the roots is the first need of the redwood, as any hilly tract of forest will show. Wherever a small gully, or bench, or basin is so placed as to receive an uncommon amount of seepage, or wherever a creek flows by, there the trees are sure to be largest. While moisture of the soil affects the development of the redwood, moisture of the atmosphere regulates its distribution. The limits of the sea fogs are just about the limits of the tree. The fogs, unless scattered by winds, flow inland among the mountains. Western exposures receive most of the mist they carry, except those higher ridges above their reach, which support, in consequence, only a scattering growth of redwood.

The wood of the redwood varies greatly. The softest and best trees usually grow in the bottoms, the "flinty" timber occurs on the slopes. But this rule does not always hold good. All sorts of unexpected and unaccountable differences in the quality of the timber occur. A soft, fine-grained tree will be found close beside one "flinty" and less valuable. Even the practical logger is never sure until he cuts it what kind of lumber a redwood will yield. The tree's vitality is so great, it endures so many vicissitudes and suffers from so many accidents in the centuries of its existence, that the grain of its wood becomes uneven in proportion as its life has been eventful. The wood fibres formed under different rates of growth sometimes get up a tension so great that when the log is sawed the wood splits with a loud report.

The seed of the redwood will not germinate in shaded places; the small seedling demands plenty of light. The crown is almost as thin and open as that of a larch, another sign that the tree is not naturally tolerant of shade. In a mixed stand the redwood's branches die off more rapidly

than those of its companions, and the crown bends eagerly to places where the light enters the forest canopy. But in spite of these signs of its sensitiveness to light, the redwood forms one of the densest forests that grow.

The reason for this is that the stand is maintained chiefly by suckering from old trees. Supported and nourished by full-grown roots and stems, young trees grow under shade that would kill the small seedling. The sprout will endure an astonishing amount of shade. In stands of second growth, so dense that not a ray of sunlight can enter, saplings 6 or 8 feet high are to be found growing from stumps, bare of branch, or foliage except for a few inches of pale green crown at the top. In very dark, damp places in the virgin forest one may find clumps of shoots as white as sprouts from a potato.

Redwood possesses qualities which fit it for many uses. In color it shades from light cherry to dark mahogany. It is easily worked, takes a beautiful polish, and is one of the most durable of the coniferous woods of California. It resists decay so well that trees which have lain 500 years in the forest have been sent to the mill and sawed into lumber. The wood is without resin, and offers a strong resistance to fire, as the record of fires in San Francisco, where it is much used, indicate. Insects seldom injure it, because of an acid element it contains. In sea water, however, the marine teredo eats off redwood piling as readily as other timber.

Redwood timber, says Dr. Hermann von Schrenk of the bureau of plant industry, possesses lasting qualities scarcely equalled by any other wood. Although very light and porous, it has antiseptic properties which prevent the growth of decay-producing fungi. So far as is now known, none of the ordinary wood-rotting fungi grows in redwood timber. It is because of its resistance to most forms of decay that the redwood reaches such a great age.

### The Abdication of Reason

Editor Independent: Clarence S. Darrow, counsel for the miners, in a speech in Chicago said: "We have been trying the case as to how much wages, how much of the coal that the miner brings up shall be taken by him and how much by the operator, who has confiscated the earth.

"The public has not yet been considered. The public never is considered and hardly deserves consideration. They let other men do their thinking; they let other men do their voting; they let other men make and enforce the laws, and, of course, they have no right to say anything about it. The great public sits still while seven or eight railroad companies deliberately take possession of all the anthracite coal which nature has placed in the bosom of the earth—all of it. They sit quiet while said companies are organized into one head and pass under one management; they sit still while these same companies take possession of all the soft coal fields there are in this country. They raise no murmur while railroad company after railroad company is consolidated into one, until a single person in Wall street may not only fix the price of every pound of coal we burn, but may determine absolutely whether we shall freeze or not."

It was declared long ago by word of God: "My people are destroyed for lack of knowledge; because thou hast rejected knowledge I will also reject thee." (Hosea iv., 6.) Again: "The ox knoweth his owner and the ass his master's crib; but Israel doth not know, my people doth not consider. Oh, sinful nation, a people laden with iniquity, a seed of evil-doers, children that are corrupters."

The great material distinction between man and the brute creation is that of reason. Because of it the gospel of eternity can be preached to the former. We are so made, and history and the present time shows the sure disaster that follows man's refusal to exercise his reason. Because man cannot be his own butcher, baker and candlestick maker he is led to believe that it is right in every particular (except his own trade, perhaps) to seek and submit to mental authority. He does this in spiritual affairs, and his folly cannot be measured by its results in this life, nor leave an example to warn his children who yet live. He does this in material matters, and lives a slave, often worse off than the ox and the ass. The man who reasons becomes the master. It will always be thus. The man who reasons will wear the crowns of those who refuse to reason. There is no sin of greater enormity in heaven's sight than that of mental abdication to men or organizations. As a man sows he shall reap.

The edict that shall stand for all time has gone forth: Refuse knowledge and live of necessity the brute life that has not knowledge. The man who refuses knowledge has no right to pray. The mass of children abhor the school life because it entails the exercise and development of the mental powers. In like manner the teacher who prods the public into intellectual effort is detested. It is so much easier (?) to pay someone to do our thinking for us. We prefer sleeping to waking. Don't make me think is the demand until we lose the power to do so and become so dead that the firing of a cannon of the caliber of that of Clarence S. Darrow fails to arouse us. I will strain my arms and break my back in muscular effort from sunrise to sunset, but I will not at all exercise my mind further than the mere skimming of the surface of things.

"Knowledge is power." If in us it is for us, and will make possible the life that now is and that to come. If we intrust to others' generosity or honesty the knowledge that should be our own the power of it will accrue to them at an expense to us that is fatal. To know is half the battle, the other half lies in doing.

LEVIN T. JONES (237).

Baltimore, Md.

### Experiments in Orchard Culture

The Nebraska experiment station has just issued Bulletin No. 79, in which are reported the results of experiments showing the effects of various methods of culture on the growth and winter-killing of young orchard trees.

It was found that careful cultivation during spring and early summer conserves soil moisture and produces a thrifty growth of young trees. Good cultivation in early summer can often be given by growing some cultivated crop like vegetables or corn, in the orchard. Uncultivated crops like grass or small grain dry the ground early in the summer and injure young trees very seriously.

Cultivation continued late in fall may cause growth to continue very late and is often responsible for winter-killing of tender trees. Cover-crops sown in midsummer cause trees to ripen their wood early, in preparation for winter, and do not injure them like grain crops grown in early summer.

Late cultivation, by leaving the ground bare, may increase the tendency toward root killing in severe winters, while cornstalks, cover-crops, etc., protect tree roots against severe freezing. Late growing cover-crops or any method of culture that leaves the ground very dry in fall will increase the danger of root injury.

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W. E. Curtis has at last found out and publishes the fact in the Record-Herald that "for some reason or another there seems to be an impression prevailing in various quarters that this (trust) legislation was intended for political purposes to satisfy public clamor against the trusts, and that the people are to be humbugged by a demonstration that will amount to nothing and have no serious effect upon the adherence of the railway companies to the republican party or diminish their contributions to its campaign fund."

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