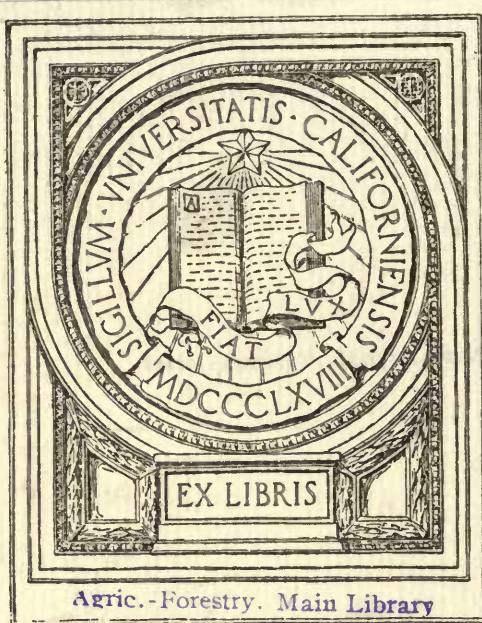


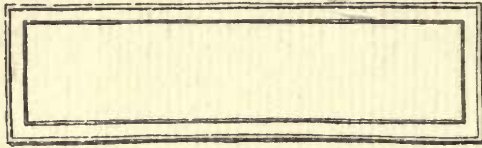
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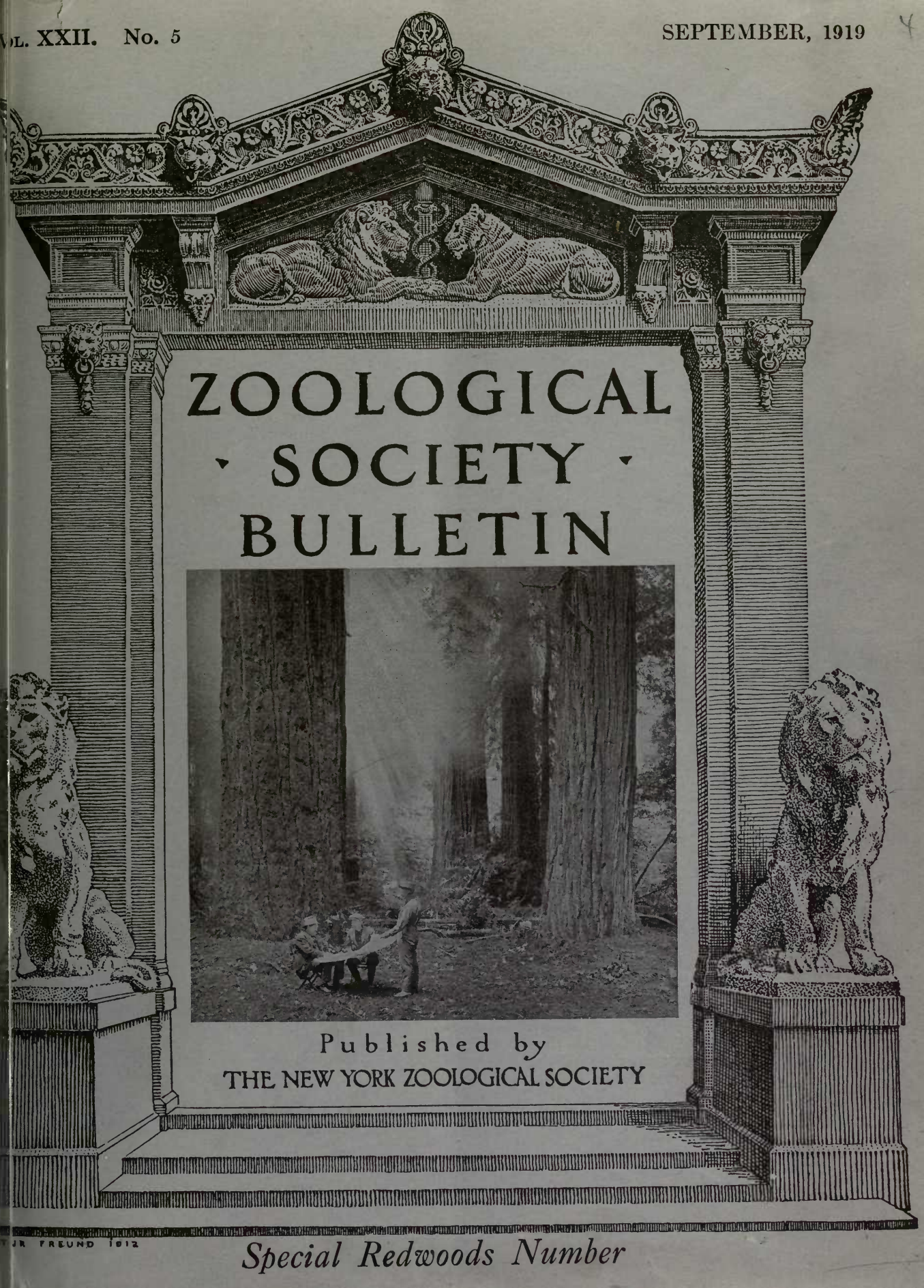


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Special Redwoods Number

SAVING THE REDWOODS

An Account of the Movement During 1919 to Preserve
the Redwoods of California

By MADISON GRANT

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Photographs by Charles P. Punchard, Freeman Art Co., and Others.

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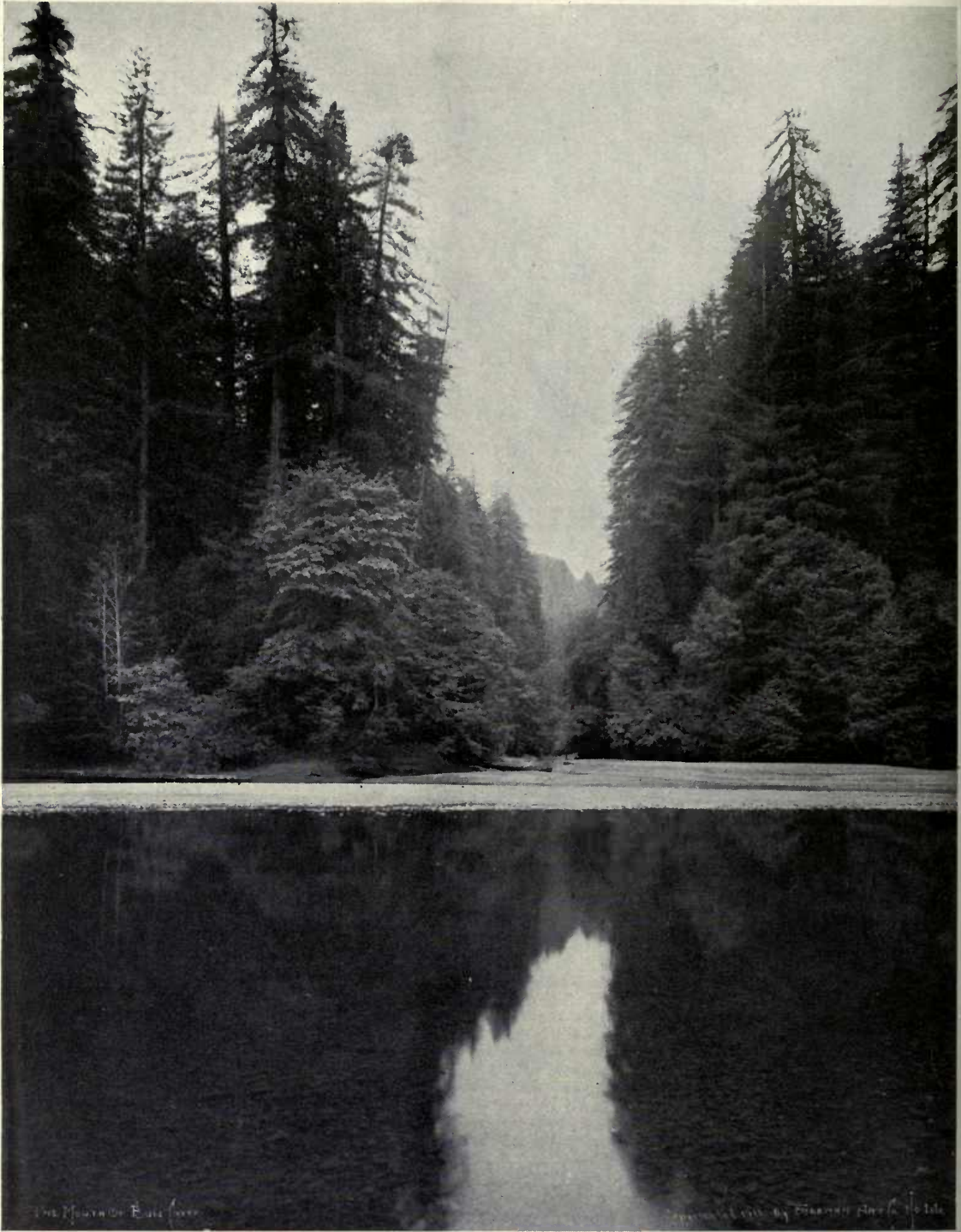
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BULL CREEK FLAT GROVE
Looking west across the South Fork of the Eel River and up Bull Creek, August 1917
Humboldt County, California. (See Page 112)

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SEPTEMBER 1919

NUMBER 5

SAVING THE REDWOODS

By MADISON GRANT

AN ACCOUNT OF THE MOVEMENT DURING 1919 TO PRESERVE THE REDWOODS OF CALIFORNIA

WHILE the cause of conservation of game and forest in the United States has advanced with a rapidity and with a degree of public support that could not have been anticipated by the early conservationists, nevertheless it has been too slow to keep pace with the forces of destruction. Members of the Zoological Society know only too well that the ever-increasing stringency of game protective measures has failed to save many species of our wild life outside of national parks and other sanctuaries, and that in them alone the game will find its final refuge.

The forests are now threatened with annihilation. It is officially stated that *at the present rate* of destruction the *old stand* of forests in the United States will all be cut over within the next sixty years. It will not last sixty years because the new and efficient methods of logging by machinery now generally introduced are not only more rapid, but make a clean sweep of every standing stick, while the old method left behind many of the smaller trees as well as a few giants which were defective and not worth cutting.

The most serious threat of devastation,—certainly the most dramatic,—is the impending destruction of the giant Redwoods of the California coast, and the following pages are devoted to a description of the efforts being made to save them.

History of the Sequoia.

The genus *Sequoia*, to which the two surviving species of the great trees of California belong, is a member of the *Taxodiaceae* and stands widely separated from other living trees. This genus together with closely related groups once

spread over the entire northern hemisphere, and fossil remains of *Sequoia* and kindred genera have been found in Europe, Spitzbergen, Siberia, Alaska, Canada and Greenland. Changes in climate and other causes have led to their gradual extinction until the sole survivors of the genus are confined to California, one to high altitudes in the Sierra Mountains, and the other to the western slope of the Coast Range. Fossil leaves and cones of genera closely related to *Sequoia* occur in the rocks of the Jurassic and of the Trias, and the members of the genus *Sequoia* were common and characteristic trees in California throughout the Cretaceous.

To give some idea of what this bald statement means, these trees, virtually in their present form, flourished in California before the mammals developed from their humble, insectivorous ancestors of the Mesozoic and while the dinosaurs were the most advanced form of land animals. The mountains upon which these trees now stand contain fossil records of early *Sequoia*-like trees, proving that this group abounded before the rocks that constitute the present Sierras and Coast Ranges were laid down in the shallow seas, to be upheaved later and eroded into their present shapes. In the *base* of Mt. Shasta and under its lava flows, the ancient rocks are marked with imprints of their leaves and cones. Such antiquity is to be measured not by hundreds or thousands, but by millions of years.

While the duration of the family, of the genus, and even the existing species, or species so closely allied as to be almost indistinguishable, extends through such an immense portion of the earth's history, the life of the living trees is correspondingly great.



The Sequoia is not only the oldest living thing on earth, but it is the tallest tree on earth, and we have no reason, so far as our paleo-botanical studies have gone, to believe that there ever existed on earth either individual trees or forests that surpassed in size, in girth, in height or in grandeur, the Sequoias of California. And these are the trees that modern commercialism is cutting for grape stakes, for railroad ties and for shingles.

The Big Tree of the Sierras.

While the purpose of this article is to deal with the Redwoods of the coast rather than the Big Trees of the Sierras, both of the genus *Sequoia*, a description of the Redwood should be preceded by a few words on the Big Tree. The Big Trees, *Sequoia gigantea*, are very different from the Redwoods and are found on the western slope of the Sierra Nevadas in California, at an altitude of from five to eight thousand feet above the sea, with a north and south range of about 250 miles. They do not constitute a solid stand, but occur in more or less isolated groves, and mixed in with them are other huge trees, chiefly white fir, incense cedar, sugar and yellow pine.

These groves are stated generally to be about thirty-two in number and are much scattered and isolated in the northern part of their range, while in the south they are larger and closer together. This distribution shows that the Big Tree is on the decline, the various groves having long since lost touch with each other, while in the north the reproduction is very poor. They all grow in spots sheltered by surrounding forests and the slopes of the Sierras are more or less windless, but unless artificially protected in national parks they would soon be destroyed for their valuable lumber.

They have suffered throughout the ages from ground fires. Their enormously thick bark, which is from one-half to two feet through, is a great protection, and the tree lives on, although its heart has been burned out, so long as this bark and its underlying cambium layer can reach the earth. If protected by human care the Big Tree has remarkable recuperative power, and many of the trees in the Giant Forest show an accelerated growth owing to their immunity from fire even for a few decades.

These trees are from five to twenty-five feet in diameter at shoulder height above the ground, and in the Giant Forest alone there are said to be 5,000 trees of over ten feet in diameter.

The height varies from 150 to much over 225 feet, and as they are without taproots they stand absolutely straight, often without branches from the ground to a height of 175 feet.

The crown usually is dead; not blasted by lightning, as has been often stated, but because ancient fires have eaten in at the base so that the flow of sap to the extreme crown has been checked. When connection with the ground and the life-giving water supply has been strongly re-established, growth takes place from the top-most uninjured branches, and forms a new but false crown. It is estimated that if these trees had escaped upsetting by the wind and had been allowed to grow entirely free from fire throughout their age long existence and had carried their proportionate growth (calculated from the tapering of the trunk) to their uttermost limits, these giants would be 600 feet high.

This is mere speculation, as is the theoretical age of some of the more ancient trees. The known age of trees which have been cut is from 1,100 to 3,250 years, but there is little doubt that this long period is much exceeded in such cases as the General Sherman tree or the Grizzly Giant. The life of these monsters can be computed only by comparison with the measured trunks of lumbered trees the actual age of which has been ascertained from the rings of growth. There is always a factor of uncertainty in the size of trees depending on their rate of growth and supply of water. In exposed positions with poor water and soil, development may be greatly retarded and a tree may be very ancient although relatively small in size. On the other hand, a favorable location, such as a pocket in the rock or access to underlying water, might greatly accelerate the growth of a tree within the same grove.

Some close observers claim that the size of the annual ring increases with the dryness and not with the moistness of the season. They argue that there is little or no rainfall in the Sierras during the summer and the ground water comes from melted snow, that growth takes place during the months when the ground is free from snow, and that a wet season means a heavy snowfall which lies around the trees late in the spring and gathers again early in the autumn, thus shortening the number of weeks available for increase of bulk.

If this theory be correct, then the series of gradually thickening rings, culminating and then thinning out again, which is characteristic



The California State Highway in 1917—before cutting



PANORAMIC VIEW OF THE C
Along the South Fork of the Eel River, Hum

of nearly all the Big Trees that have been studied, would record *dry seasons* and *not* those of abundant moisture. This theory flatly contradicts the evidence recently deduced from a study of the growth rings of these trees with reference to oscillations of climate throughout the Northern Hemisphere.

Redwoods of the Coast.

The Redwood of the coast, *Sequoia sempervirens*—the immortal Sequoia—well deserves its name. Far from being a battered remnant like its cousin of the Sierras, whose shattered ranks remind one of ponderous Roman ruins, the Redwood is a beautiful, cheerful and very brave tree. Burned and hacked and butchered, it sprouts up again with a vitality truly amazing. It is this marvellous capacity for new growth from trunk or from root saplings, which is perhaps the most interesting character of the Redwood in contrast with the Big Tree, which has no such means of regeneration and must depend on its cones for reproduction.

All the Redwood forests have been more or less injured by fire, often deliberately started by the lumbermen to clear away the slash, and it is a wonderful sight to see a charred trunk throw out a spray of new growth twenty or thirty feet above the ground, or a new tree standing on top of an ancient bole and sending its roots like tentacles down into the ground around the mother stump. Other trees stand athwart the fallen bodies of their parents and continually



A REDWOOD FOREST
Before Cutting



STATE HIGHWAY IN 1919
before lumbering operations were started



A REDWOOD FOREST
After Cutting

readjust their root system to the decaying trunk beneath it.

The vitality of the second growth throws up a circular ring of new and beautiful Redwoods around the parent stump, and these little trees come up again and again if cut. If, however, they are burned several times in succession, this capacity of shoot reproduction appears to be lost and there are cases, notably about fifteen miles north of Arcata, in Humboldt County, where the highway passes through three or four miles of very large and thickly set burned stumps that show little or no signs of reforestation, proving that there are conditions where human greed and human carelessness make it impossible for even the Redwood to survive.

The age of the Redwood is about half that of the Sierra Big Tree, and the life of a mature Redwood runs from 500 to 1,300 years, in many cases probably rather more.

The diameter of the larger Redwoods is sixteen feet and over, and the height runs from 100 to 340 feet. Thus, while the diameter is less, the height is far greater than its cousin, the Big Tree, with the result and effect of a graceful beauty rather than vast solidity. It is probable that trees will be found which will exceed this maximum altitude, and it is quite possible that an ultimate height of 350 feet may be recorded. One would anticipate the discovery of this *tallest tree on earth* either in Bull Creek Flat or along Redwood Creek.



LUMBERING OPERATION NEARLY COMPLETED
McKee mill on the Highway, South Fork of the Eel River, Humboldt County, 1919. (See Page 107)

Of course, in discussing the present Redwoods, one must always bear in mind that many of the finest groves have fallen to the axe, judging from the silent records of gigantic stumps along the Eel River, especially at Sonoma Flat, only recently destroyed, to say nothing of forests to the north long since cut away. It is probable that the existing groves, with few exceptions such as Bull Creek Flat, do not represent the finest groves of Redwoods of fifty years ago. How needless all this sacrifice of Humboldt Redwoods has been may be measured by the fact that few if any of the lumber companies have proven profitable investments, if their failure to pay dividends is a test of their commercial success.

On rare occasions, notably where a strong wind follows long rainy seasons, Redwoods when exposed on high ridges may be blown down, but there are no such windfalls as are found in the forests of Canada. The danger of wind overthrowing Redwoods, even when in a thin strip along a road, is very slight if there is reasonable protection from the contour of the ground.

The original range of the Redwoods extended from Monterey north along the California coast to a point a few miles over the Oregon line, embracing an area with a length of about 450 miles and a width not exceeding forty miles. The narrowness of this range seems to be determined by the fog which sweeps in from the Pacific, and the writer has seen the edge of the fog-bank clinging closely to the inland limit of the Redwood belt. The natives, with the usual human capacity for error, state that the Redwoods attract fog, but of course it is the moisture of the fog deposited on the tops of the Redwoods that determines their inland distribution. These forests are sometimes so wet that the dripping from the high crowns is like a thin rain, and at Redwood Creek during the past summer it was hard to tell whether it was raining or not, so saturated with moisture were the foliage and the trunks, when the fog darkened the forest.

In the southern and larger half of its range, the Redwood is somewhat broken up in more or less isolated groves, and the axe of the lumberman has now separated these groves still more widely. In the north there is an almost continuous series of solid stands of Redwoods, constituting the most magnificent forests in the world, not even excepting the great Douglas firs and pines that adjoin them in Oregon.

The Redwoods in the south seem to show a marked variation from those of the north, being generally redder in color, and their growth in rings or circles is much more frequent than in the groves of Humboldt and Del Norte Coun-

ties. A further study will probably bring out other characteristic differences.

South of San Francisco the Redwoods are now chiefly found in the Big Basin, which has been wisely made into a state park, and in the famous Santa Cruz grove. Intermediate spots along the Coast Range, notably at La Honda, are interesting chiefly as showing the pathetic solicitude with which the owners of surviving trees care for the battered remnants amid the charred stumps of former giants. Here at least the owners have learned that the value of a living tree at a public resort or along a highway far exceeds the value of its lumber. All these southern groves are mere reminders of the forests that are gone, but the surviving trees will be carefully protected.

North of San Francisco, the Muir Woods on the slopes of Mount Tamalpais are easily accessible and show something of the forest grandeur formerly found in the region of the Golden Gate. The preservation of this grove is entirely due to the wise munificence of Mr. William Kent, who presented it to the nation, and put into practical form that devotion to California about which so many of its sons talk eloquently and do so little to perpetuate.

To the north, Sonoma County has purchased for public use the Armstrong Grove, and Mendocino County probably will be impelled to buy the Montgomery Grove. These last trees are situated near the highway to the north of Ukiah, and will be the first grove visited by the north-bound tourist. If they are purchased by the town or county, Ukiah will become the entrance to the Redwood Park series, and like Merced at the entrance to the Yosemite Valley will derive a great revenue from motor tourists.

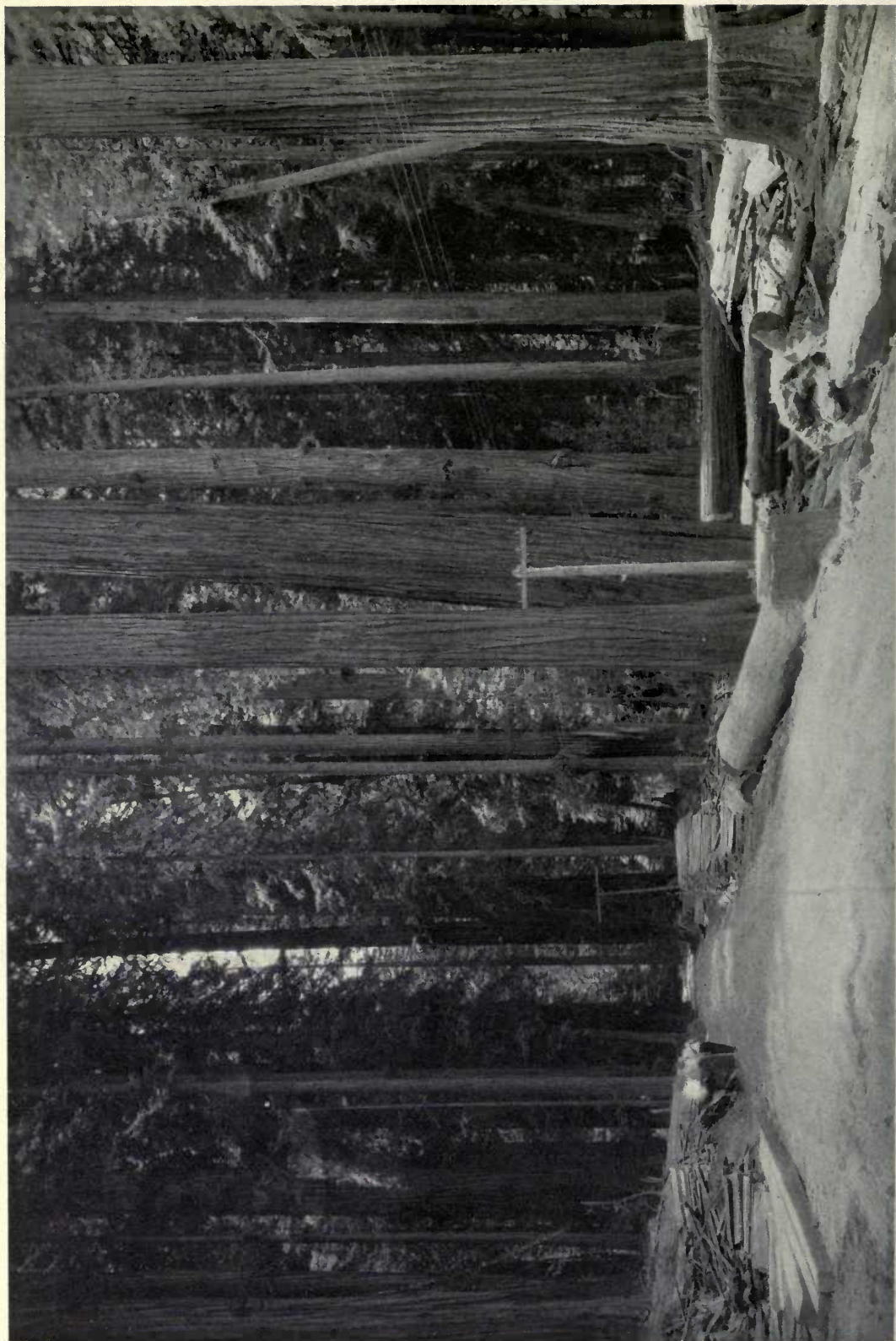
After leaving Mendocino county one enters the great groves of Humboldt and Del Norte Counties. Here are solid stands of Redwoods and their subtle charm is so uniform that the observer finds it difficult to distinguish between one grove and the next.

Four great forests stand out prominently: They are the groves along the south fork of the Eel River and the west bank of the main Eel, culminating in the Bull Creek Flat and the Dyerville Flat; the immense Redwood Creek grove; the Klamath River groves, and the Smith River groves in Del Norte County. Each has its peculiar beauty and it is difficult to choose among them, but it is the trees of Humboldt which at the present moment are most in peril.

See pages 111, 113, 114, 115.

Destruction

The groves along the south fork of the Eel River are traversed by the state highway now



IN THE DEPTHS OF THE REDWOODS IN 1919.
On the edge of a grape-stake cutting along the Highway in South Fork basin (See Page 99)
Photograph by the Freeman Art Co., Eureka, California

in the process of construction. The route of this highway made the timber accessible and the immediate result was the establishment of small lumber camps that are destroying the trees along its edge. Not only are the trees along the road cut down, but the highway itself in many cases has been injured. It is hard to find more disastrous bungling even in road construction.

One logging company, having thoroughly devastated large areas of its home state in the east, has recently purchased great tracts of Redwoods. These have been farmed out in small plots of forty acres each to various individuals, who purchased on what was virtually a stumpage basis, and the cutting was in full swing in July 1919. The writer drove through these same groves two years ago, in August 1917, and the change was sickening. This example of human greed and waste can scarcely be described. The pictures on pages 101-102, 104-105 tell the story better than words.

These great trees with their hundreds of feet of clear timber have among other valuable qualities the unfortunate characteristic of easy cleavage or splitting, and so they are doomed to the ignoble fate of being riven for railroad ties, for shakes or shingles, and perhaps worst of all, for grape stakes. Let no one, whether opposed to Prohibition or not, waste sympathy on the California wine-growers, whose sad lot it was last year the fashion to deplore. Grapes in California command today two or three times the price they ever brought before, and the development of the vineyards is the most immediate and threatening danger to the Redwoods of California. These superb trees are sacrificed to supply the stakes to carry vines, because of the practically indestructible character of their wood, which will stand in the ground almost indefinitely without rotting.

Survey of the Redwoods in 1919

On August 7, 1919, Stephen Tyng Mather, Director of National Parks, and the writer left San Francisco to study the available Redwood stands with reference to the selection of a site for a National Redwood Park, and to observe at first hand the actual destruction in progress.

The first night brought the party to Willits, beyond Ukiah in Mendocino County. Up to this point there were few or no Redwoods except the Montgomery grove, which lies to the west of the highway. From Willits the highway is under construction, and the Redwoods begin to appear along the roadside in small and scattered groups about fifty miles to the north,

and while they are insignificant in comparison with the great Humboldt groves, nevertheless these trees are highly important in connection with the highway and should be preserved.

The highway itself has not been built with an intelligent regard for the preservation of natural features, and the usual wasteful and destructive methods common to road contractors are everywhere followed.

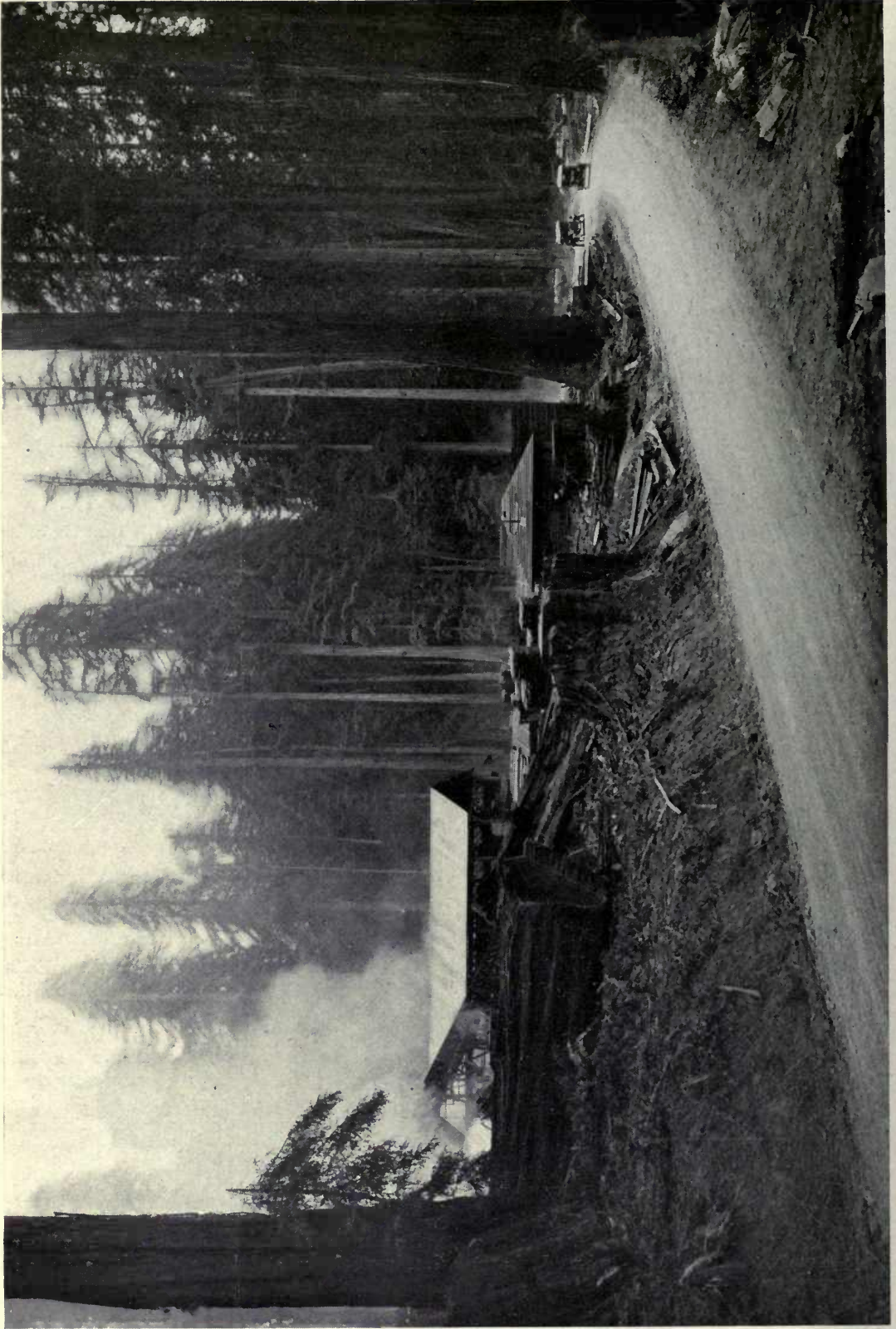
In the construction of motor roads here and elsewhere in California, and for that matter in Oregon and Washington, the commissions in charge should employ a landscape engineer; that is, an engineer with some elemental sympathy with nature should supervise the work. The contractors should not be allowed to leave a wide area of devastation adjoining the roadway. Unnecessary vandalism, such as wrapping wire cables around the bases of the trees to support derricks, should be stopped; but, no doubt, all this will come after the trees and the scenery have been largely destroyed.

As to the trees along the highway in Mendocino County, the possibility of their protection depends entirely upon the action of the Highway Commission in securing a right of way which should not be less than an average width of 300 yards.

The Redwoods grove at Hicks Camp is the first important camping site to be passed, and about twelve miles south of Garberville is the Sterns Camp grove, which is about ten acres in extent with a width of about 300 yards, and is a fine stand on a level flat. At this point it becomes evident that any park in connection with the highway must take in the entire erosion valley of the south fork of the Eel from crest to crest. The skyline with its superb trees is nearly as important as the flat bottom and much more important than the intermediate area. The river valley is narrow, in fact, little more than a wide gorge, with a level bottom, and the timber on the slopes has less commercial value than that upon the flat. If the timber along the highway is to be preserved, a relatively small amount of additional cost would save the entire valley. While it may not be necessary to go far beyond the crest, nevertheless as the trees are exposed a substantial amount of timber behind probably will have to be taken to protect them.

There is a fine grove at Red Mountain, and a little beyond the first cutting appears.

At a point six miles south of Garberville the first very large stand occurs. Here we were shocked to learn that the California Highway Commission not only had failed to acquire a



CUTTING AND BURNING REDWOODS IN 1919
Mill of Percy Brown on the Stafford Tract on the main Eel River above the Highway Bridge, Humboldt County
Photograph by the Freeman Art Co., Eureka, California



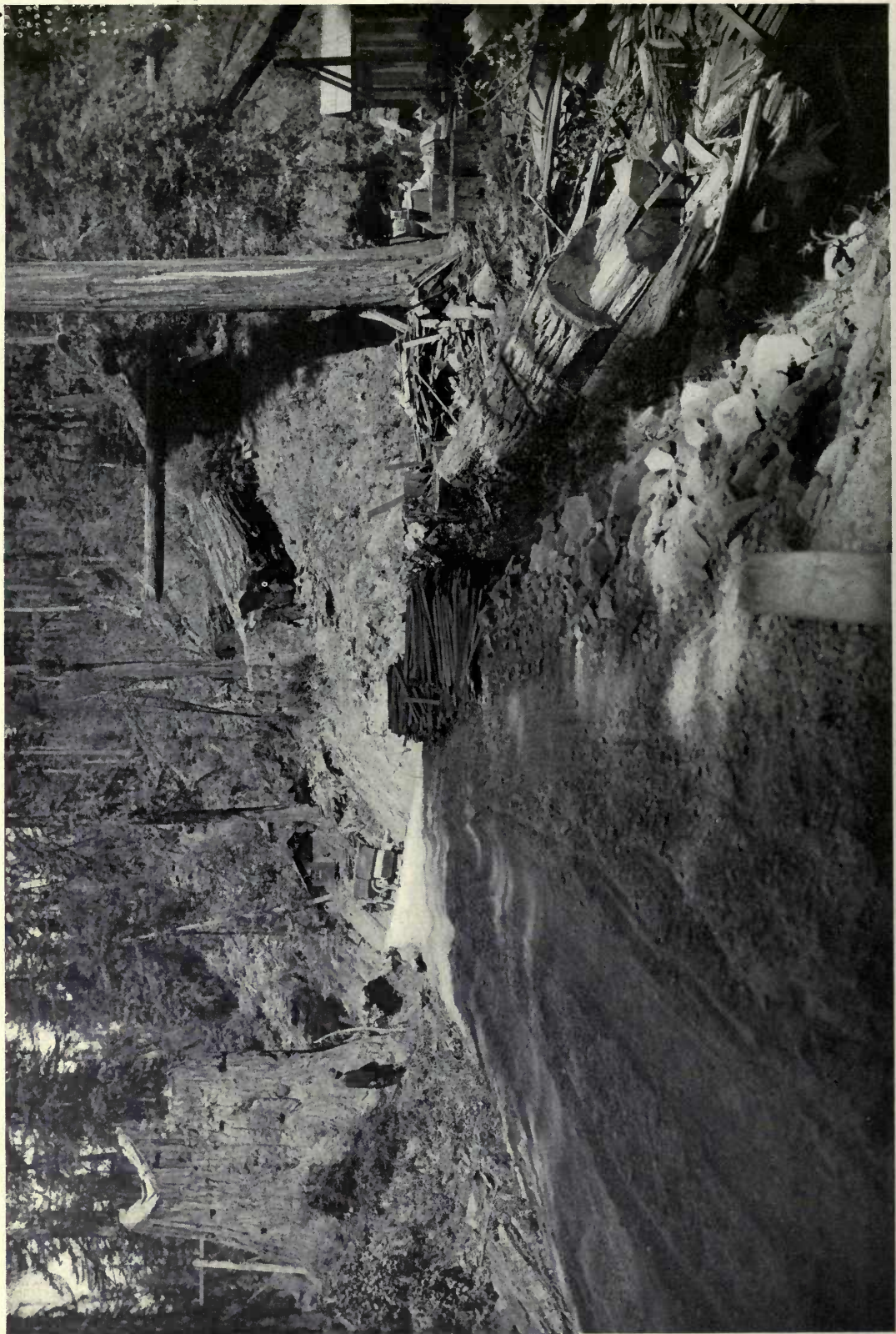
TYPICAL LUMBER MILL

On the State Highway, South Fork of Eel River, Humboldt County. Photograph by Chas. P. Punchard
August 1919. (See Page 107)



GRAPE STAKE CUTTING

On the South Fork of Eel River, Humboldt County. Photograph by Chas. P. Punchard
August 1919. (See Page 107)



LUMBERING ALONG THE HIGHWAY IN 1919
On South Fork of Eel River. Note the mammoth Redwood stump on left and piled grape stakes on right. (See Page 107)
Photograph by the Freeman Art Co., Eureka, California

sufficient right of way to protect the timber along the route, but actually had contracted with the owners of the land for the removal of the timber. In other words, the Commission bought a hundred foot strip with the understanding that the owners should cut off the only thing of value, namely, the timber. This incredible folly can only be explained by the widespread belief that a strip of timber along the road will blow down unless covered and protected by the forest behind.

The writer does not intend to enter into a discussion of this question, but it seems to be universally believed in the Redwood country that trees blow down if the adjoining forest is cut off. There is but the slightest basis for this tradition. Trees on ridges which have been exposed by cutting, or an isolated strip of trees standing *across the line* of prevailing winds, may in exceptional cases be blown down, because the Redwoods, like the other great trees of California and Oregon, are without taproots. The writer (who has been through the Redwood belt twice from end to end and has visited practically every grove of importance) never has seen a single instance where trees have been blown down en masse, and he has seen again and again isolated trees and groups of trees in most exposed positions, that have stood for years in defiance of wind and storm. This is particularly significant as many of these trees were imperfect or burned at the core and consequently had but insufficient support.

This myth of trees being blown down has been exploded again and again, but in order to kill definitely this old woman's tale it must be made the subject of an authoritative report by the Bureau of Forestry. The superstition stands precisely in the same class of evidence as does the silly story universally believed by trappers that the porcupine shoots its quills. It is strange that the one place where misinformation about zoology and the habits of animals flourishes most is among backwoodsmen and even guides, just as ignorance of the true principles of heredity is so widespread among the breeders of horses and dogs. In the same way, men in the lumber country are surprised when a skeptic from the outside world ventures to question the sacrosanct doctrine that, if cutting in a forest is once started, all the trees must be lumbered or they will be blown over by the wind. Possibly this belief has been encouraged by the wiser lumbermen for ulterior purposes.

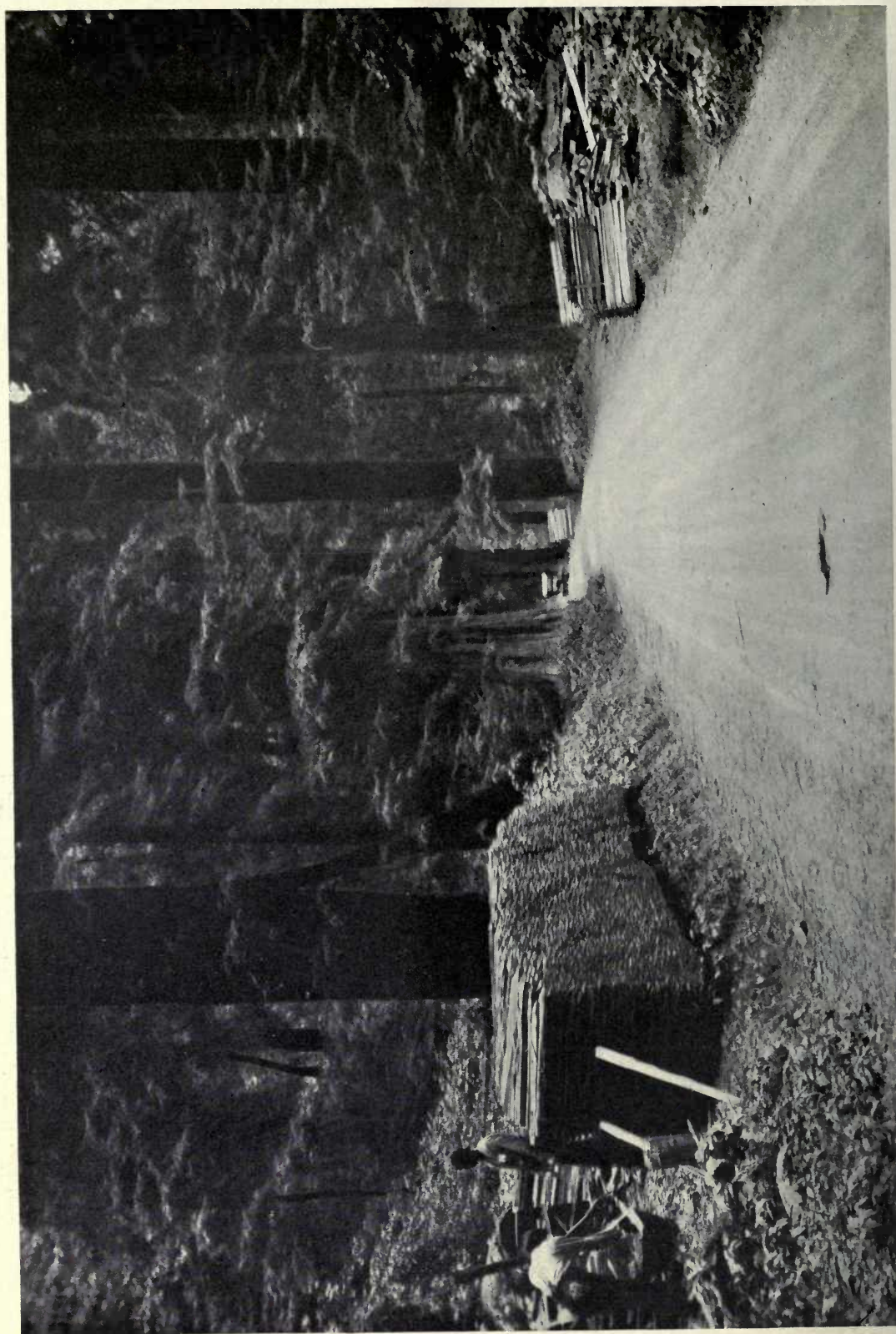
The mere fact that there is little or no evidence of trees blowing over even though in the

most exposed positions, and the further fact that numberless trees, isolated or in groups, which have been deprived of all their supporting trees, stand for years without falling, are of little weight against this venerable superstition.

This yarn is encountered throughout the north, perhaps with rather more justification, among the yellow pine forests, but even there the writer has failed to find any evidence for it, although he does not pretend to have covered the ground as in the case of the Redwoods. Among the Redwoods one of the most noticeable features is the absence of fallen trees, such as cover the ground everywhere in Canada and the northern greenwood forests.

Another superstition of the same character is, that Redwood trees and timber are not injured by burning over because of the fact that these trees, like nearly all other very large trees of California, are resistant to fire by reason of their thick bark, and that many of them show scars of ancient conflagrations, even in the damp forests of the north. The result is that there has been a great deal of deliberate burning of brush, both preceding and following lumbering operations. In the ordinary lumbering operations the trees are felled and the masses of fallen material—brush, shattered branches and sometimes trunks—are then burned. This is said to be necessary in order to saw up the giant trunks, several reasons being given, chiefly the difficulty of lumbering among masses of fallen débris. The statement is also made that the workmen object to the alleged danger of cutting unless the rubbish has been burned.

However that may be, the burning results in very substantial destruction of good timber, estimated in some cases as high as thirty per cent. This proportion was said to be established by an experiment made many years ago by the A. B. Hammond Lumber Company, which has been unusually intelligent in the utilization of its holdings. A comparison was made between two tracts of equal area, one burned over in the usual wasteful manner and the other logged without burning, and the result showed that the burning destroyed about thirty per cent. of the timber. Whether or not there is any economy in the method of lumbering with assistance of fire, the public has a right to put a stop to this destruction of good timber because the time is coming when wood will be as valuable in California as it now is in Europe. What action would the state take, and rightly take, if the hotels in New York threw away one-third of the food which was purchased to supply their guests on the theory that it was their prop-



PILES OF GRAPE STAKES
Along the Highway, South Fork of Eel River, Humboldt County, in 1919.
Photograph by the Freeman Art Co., Eureka, California



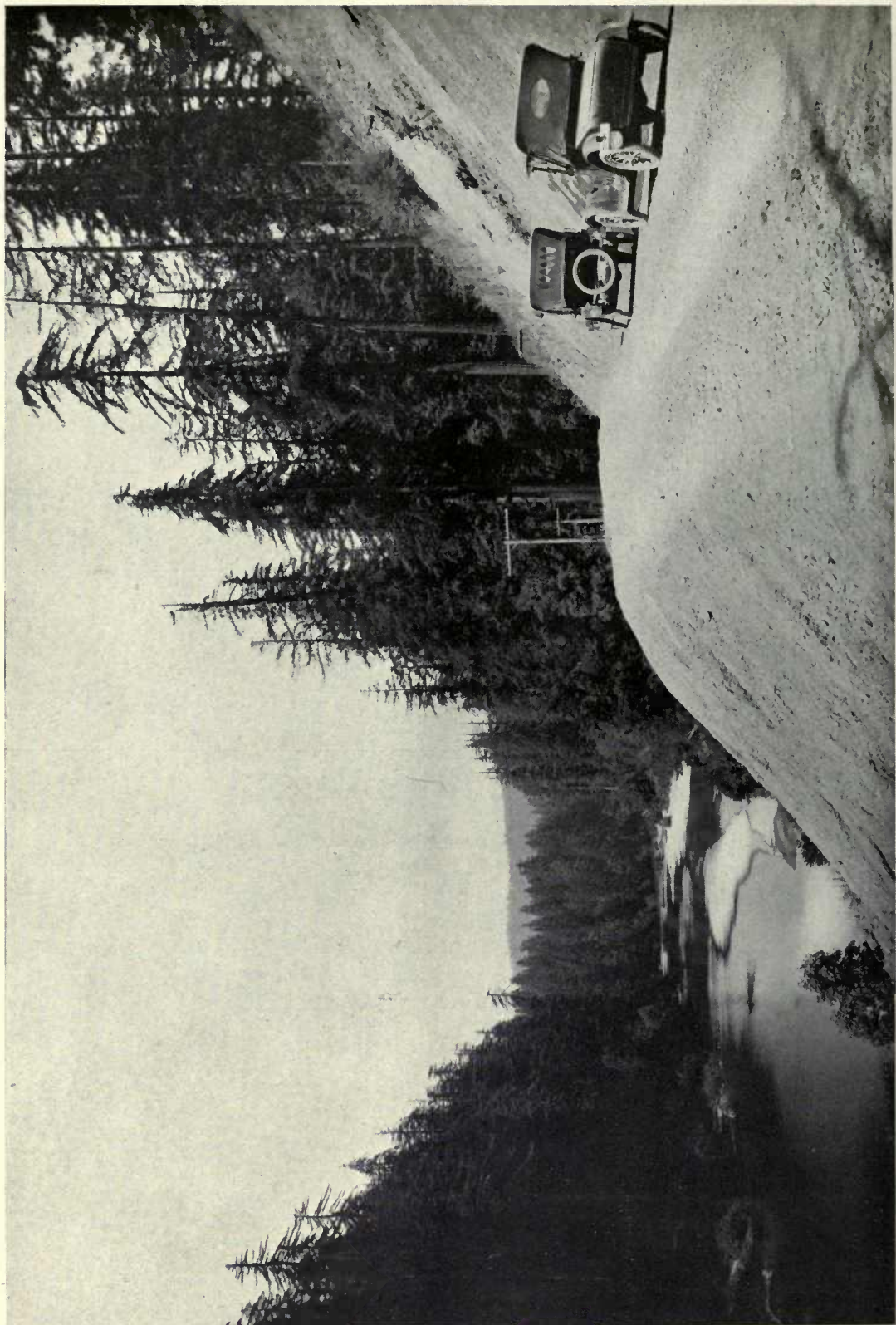
SPLITTING THE REDWOODS

Along the Highway, South Fork of Eel River, Humboldt County. Photograph by Chas. P. Punchard
August 1919. (See Page 107)



LUMBERING ALONG THE STATE HIGHWAY

South Fork of Eel River, Humboldt County. Photograph by Chas. P. Punchard
August 1919. (See Page 107)



REDWOODS ON SOUTH FORK OF EEL RIVER, HUMBOLDT COUNTY CALIFORNIA
Looking south and up South Fork of Eel River with Bull Creek Flat Grove on right and Dyerville Flat Grove on left.
Photograph by the Freeman Art Co., Eureka, California

(See Page 107)

ZOOLOGICAL SOCIETY BULLETIN

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ELWIN R. SANBORN,
Editor and Official Photographer

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SEPTEMBER 1919

erty? Surely this is one of the most glaring examples of the necessity of the state interfering with the management of private property to prevent its wasteful exploitation. Countless tons of slabs and lumber also are burned to get them "out of the way." Are there no by-products from lumber such as there are in the refining of petroleum or in the conversion of hogs into bacon?

In Garberville, we were received by a group of citizens headed by Judge F. A. Cutler and A. E. Connick, who showed our party over the road as far as Eureka, and pointed out the lumbering operations in full progress along the road, examples of which are shown in the accompanying illustrations on page 105.

The railroad ties were purchased under the authority of the United States Railroad Administration, but in justice to the officials it may be said that they did not realize the vast injury to the state highways when they authorized the use of Redwood timber for ties. The Railroad Administration, through its chief, Mr. R. G. Sproul, and Mr. H. W. Ellicott, Purchasing Agent of the Northwestern Railroad, immediately stopped the buying of ties from areas which would come within the proposed reservation, as soon as the matter was officially brought to their attention by the writer, and they expressed their entire sympathy with the plans for the preservation of these trees.

The cutting has been done in almost every case along the east bank of the south fork of the Eel River and on the very edge of the highway, and while the devastation is appalling, nevertheless the damage if arrested at the present time can ultimately be minimized.

Some distance below Garberville, the highway leaves the river and does not reenter the Red-

woods until just above Phillippsville, where there is a fine stand of Redwoods on the left bank. At Phillippsville itself there are five acres of very fine trees on both sides of the road, and again at Fish Creek there is a four-acre tract of Redwoods which has not yet been injured by cutting.

Below Miranda, on Logan's Flat, there is a fine stand on both sides of the road some four or five hundred acres in extent. This is offered for sale, but as yet there has been no cutting.

The first cutting below Garberville appears at Elk Creek, where a few trees have been cut for grape stakes, and more cutting appears a little below. Further down the river there is another stand of about 200 acres of bottom land, with more or less cutting. Further down again on the left bank is a very fine, thick stand of Redwoods, 700 acres in extent. This tract is not in immediate danger because it belongs to the A. B. Hammond Lumber Co., which is not cutting in this section. These trees undoubtedly should be included in any park along the highway. Below this point and near the river and highway, cutting is actively going on and there is serious danger of the entire destruction of the flat.

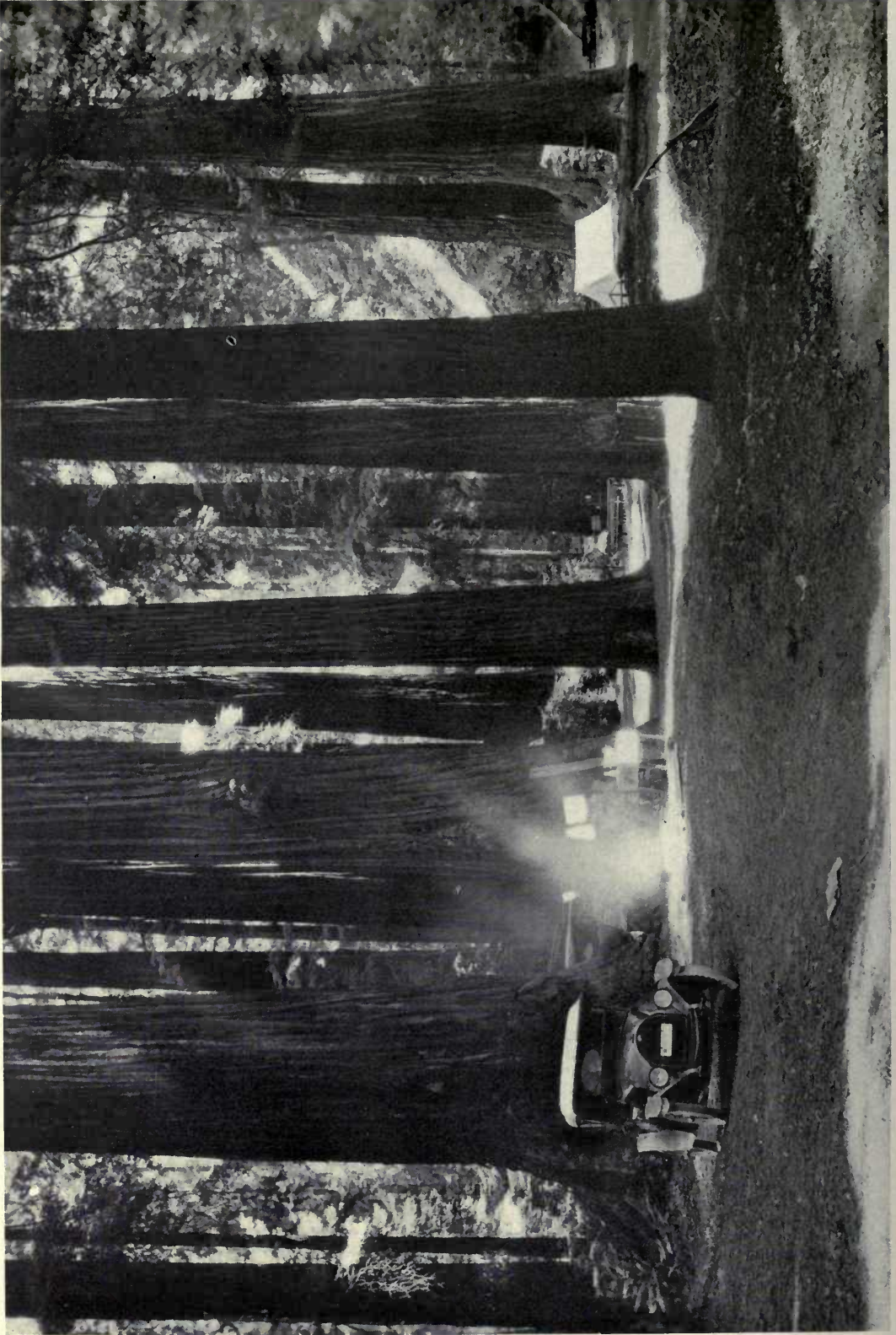
Near here and on the right side of the highway a stand of timber belongs to the University of Minnesota. It is reasonable to assume that a university—an educational institution—may be interested in the permanent preservation of these trees.

Below this again there are some small mills. Most of the cutting here has been finished, and while the destruction has been very serious further work has been suspended. See page 96.

Further down the river at Pepper Wood the forest has been greatly exposed by cutting, showing again that trees will stand along these river flats even though left entirely without shelter.

In connection with the theory that exposed trees blow down, it should be stated that the Northwestern Pacific Railroad owns a few Redwoods on its right of way between the tracks and the main Eel River, and that some of these trees, being absolutely isolated and in a very exposed position, have been overthrown by the wind.

After these scenes of devastation and threats of worse, we turned into Bull Creek Flat, perhaps the finest forest in the world. Bull Creek flows into the left side of the south fork of the Eel River just above Dyerville, where the south fork joins the main Eel. It is a magnificent stand of trees, some 10,000 acres in extent. See pages 90 and 106.



REDWOODS GROVE, DYERVILLE FLAT, HUMBOLDT COUNTY, CALIFORNIA, IN 1919
Entrance to the proposed Redwoods Park, Used as a camping ground. Now being cut by the Pacific Lumber Company. (See Page 109)

The total area which must be taken for the Highway Park, from the upper reaches of the South Fork down to the mouth of Bull Creek, contains about 10,000 acres in addition to the Bull Creek grove.

Bull Creek Flat belongs to the Pacific Lumber Company, except two sections in the upper part, which are the property of the Metropolitan Lumber Company. The officials of both these companies expressed their sympathy with the park project so far as it relates to Bull Creek Flat. This tract is said to contain one enormous tree, possibly the largest Redwood and the tallest tree in the world.

Immediately opposite the mouth of Bull Creek is Dyerville Flat, a triangular area between the two forks of the Eel River. At this point is located South Fork railway station, and it will be the natural entrance to the Park. The trees have been cleared away around the station to the extent of 150 or 200 yards and the Pacific Lumber Company has just begun lumbering at this point, in September 1919. If this cutting is continued it will greatly injure the approach to the proposed park. The reason given for commencing lumbering operations here is the shortage of man power, making it desirable to log on a flat and in the immediate vicinity of the railroad in order to keep the mills supplied. This cutting is the one great danger to the proposed park and is a most serious situation as yet unprovided for. See page 108.

Below the junction of the South Fork, the timber on the right bank of the main Eel River has been entirely destroyed and the landscape presents a scene comparable only to the devastated regions of France. Few Redwoods are left, but a magnificent example has been provided to show how the whole country will appear when lumbering operations are extended to the west bank. Reforestation is very slight and many places show no signs of regeneration. The stumps have been charred and burned, and the land lies worthless.

This cut over area on the right bank would be a suitable site for reforestation experiments under the present California Forestry Board. The land could be acquired, and reforested at nominal cost. It is only a question of time when the state, for its own protection, will be forced to undertake this work.

The fundamental tragedy of the whole Redwood situation lies in the fact that these great trees are nearly all in the hands of private owners who cannot reasonably be expected to sacrifice their holdings for public benefit. The state and nation, however foolish they may have been

in giving away these lands, must now buy back at least a large portion of them.

On the east bank of the Eel River for many miles below the Forks there are very few Redwoods in sight of the river except at Fortuna, where 2,300 acres of fine Redwoods have been preserved temporarily and are known as the Carson Woods. This grove is a mile or so east of the highway and should be preserved as a local park.

Along the lower stretches of the Eel River below Scotia, the Pacific Lumber Company is said to have checked reforestation by cutting during successive years the sprouting saplings which bravely tried to lift their heads around the old stumps. This was done under the impression that the land could be made available for pasturage. It has proved a failure and the only result has been to destroy in many places the chance of reforestation.

Below the forks on the left bank there is a magnificent stand of trees extending from the water's edge to the crest of the main slope, nearly all of which belongs to the Pacific Lumber Company. This area is some 20,000 acres in extent and the highway runs through it. It should be preserved, although the cost would be great, because of the size of the tract and the fine quality and thickness of the timber. Below this forest, the land on both sides of the river has been almost entirely destroyed, so far as timber is concerned.

At Eureka there was great interest shown on the occasion of our visit. The citizens were organizing actively to put a stop to the destruction of the Redwoods along the highway. Public meetings were held, which developed later into affirmative action to be described later. This enthusiasm was due in great degree to the recent visit of Secretary of Agriculture Houston and Col. Graves, Chief of the United States Bureau of Forestry, who had aroused the people of Humboldt County to the importance of protective measures.

Along the coast from Eureka north about twenty miles, there is little or nothing but cleared country, and beyond Arcata the road runs between some three or four miles of charred stumps which show no signs of reforestation. This condition appears to be entirely due to repeated fires.

At Orick, on the Big Lagoon, we passed the lower end of the Redwood Creek grove, one of the very best stands of Redwood in Humboldt County, approximately 50,000 acres in extent; the lower part largely owned by the A. B. Hammond Lumber Company and the upper part by

the Sage Lumber Company. This stand of Redwoods is largely mixed with spruce and the ground is carpeted with ferns in great abundance and variety.

One of the most conspicuous features of these Redwood forests, especially in Del Norte County and the northern portions of Humboldt, is the profusion of ferns. It is said that some thirty species of ferns are found in these woods.

This Redwood Creek stand is as yet untouched and should be carefully considered for a national park, because the timber being inaccessible can be acquired at a relatively small cost.

The most important groves north of this section are on the Klamath River and also on the Smith River in Del Norte County, known as Mills Creek grove. There are several other groves in this region and the Redwood stand throughout Del Norte County is exceptionally fine. The trees, perhaps, are less healthy but they are larger, more weird and grotesque in their contours, and while less valuable for timber, are even better adapted for preservation in a park. As Del Norte County is somewhat remote it may be immune for a short time from serious inroads by the axe, and there is no doubt that the Smith River Redwoods should be acquired ultimately for a national park.

On our return from the north the writer was called upon, as one of the representatives of the Redwoods League, to return to Eureka and take part in the park movement which had made great progress since our first visit. The citizens of Eureka had brought together at a public meeting all the small holders who were actually operating along the highway. As a result of this remarkable public demonstration, the lumbermen agreed for the sum of \$60,000 to suspend cutting and to give two-year options on their property at reasonable figures. Thirty thousand dollars of the money needed were donated by Stephen T. Mather and by William Kent, both Vice-Presidents of the Redwoods League. The remaining \$30,000 were supplied from the county funds of Humboldt County. These options were purchased upon the understanding that they would be exercised when due and the lands paid for by special county bond issues. The state of California is expected to furnish a general bond issue for the purchase of the remaining timber lands on the south fork of the Eel, together with the Bull Creek and Dyer-ville Flats, containing in all some 20,000 or 25,000 acres.

The great stand of Redwoods on the left bank of the main Eel River below the forks was left out of consideration temporarily because of the

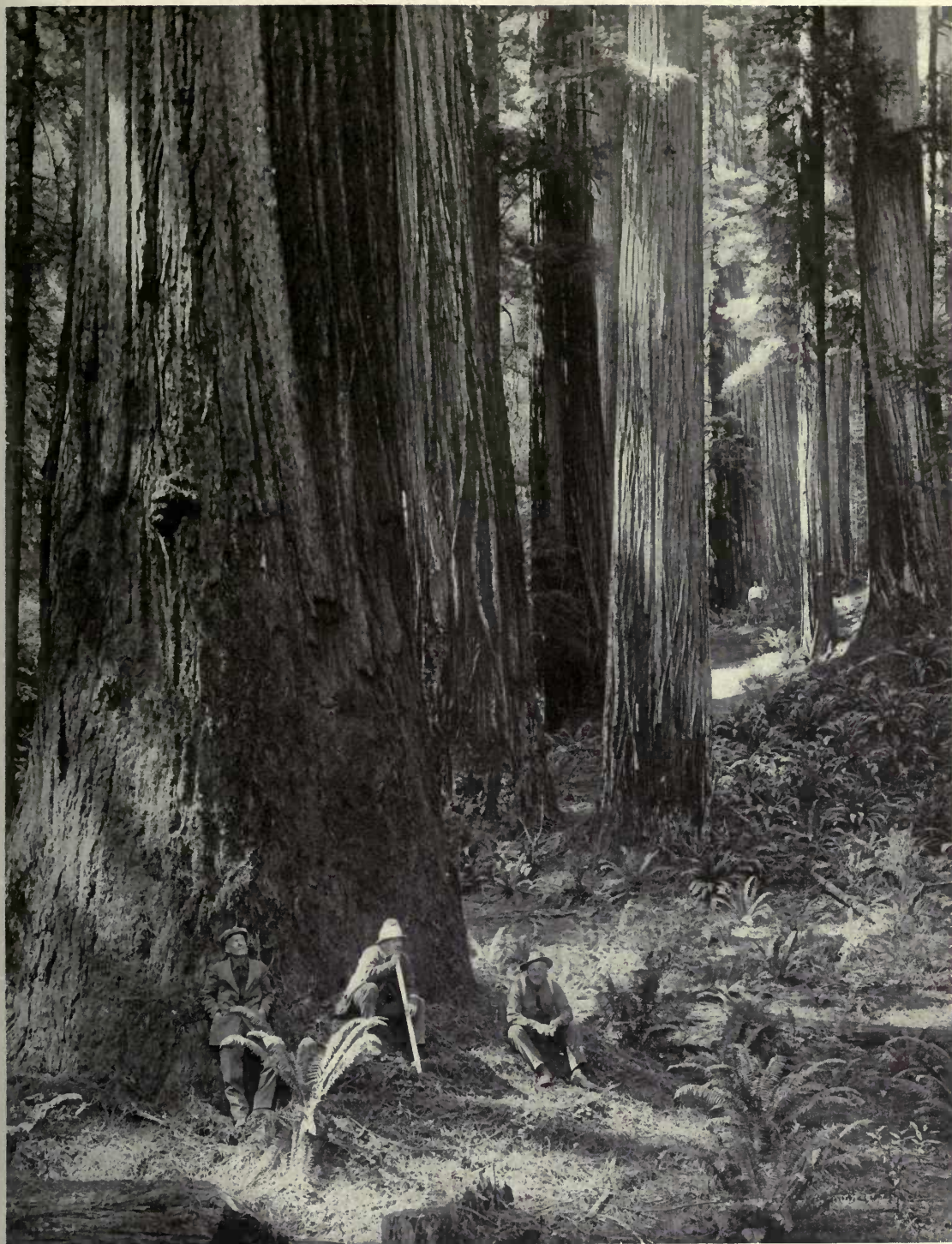
large sum involved in its purchase, but if the preservation of the South Fork is once secured public interest will inevitably demand the extension of the Park to include these trees. It is perfectly obvious from the aroused public sentiment in Humboldt County and elsewhere in California that the time is at hand when lumber companies will not be allowed to destroy such superb groves for a net return often absurdly small.

The protection of these Redwoods must be secured by Humboldt County and by the State of California, but the Federal Government also must do its share by establishing a large National Redwoods Park. To obtain Congressional action is a matter of many months, but a resolution has been offered in Congress by Representative Lea, calling for an investigation of the whole Redwoods problem with a view to the establishment of such a park. Heretofore national parks have been carved out of the public domain and it will be a new departure for Congress to buy private lands for public use on any such scale as will be necessary here.

The Redwoods League looks confidently to private holders of timber to donate either groves of Redwoods which are within the proposed park area (and several such donations have already been offered), but it also expects to receive gifts of Redwoods which can be exchanged for land within the park area. There are many patriotic Californians who will be only too glad to donate funds for the preservation of the Redwoods when they realize that there is an organization ready to accept, administer these groves and turn them over to the State or Nation when the proper time arrives.

The inhabitants of Del Norte and Humboldt Counties have scarcely awakened to the possibilities of fabulous wealth in their Redwoods as an attraction for visitors. The annual value of the tourist crop to southern California is said to be about \$80,000,000, although natural curiosities other than the climate sometimes have to be manufactured. As an amusing example of the business acumen of southern California, one may mention Ramona's "place of marriage" and her "grave," at San Diego, to both of which the tourist is religiously conducted and gravely assured that, if Ramona ever had lived other than in the brain of a sentimental novelist, she would have been married and buried at these mythical shrines.

When Humboldt and Del Norte Counties awaken to a full realization of the revolution effected by automobiles, which will flood the country with tourists as soon as the highways



KLAMATH RIVER REDWOODS

The tree on left is eighteen feet in diameter. Courtesy of Charles Willis Ward
(See Page 97)

are completed, they will find that a Redwood grove, such as Bull Creek Flat, is an attraction that is worth to the county many times the full net value of the timber contained in it. When the last Redwoods are destroyed, towns like Eureka and railroads like the Northwestern Pacific Railway will be without resources, and will die away like many another predecessor in the United States and Canada.

All these are purely commercial considerations. It is scarcely necessary to dwell on the crime involved in the destruction of the oldest and tallest trees on earth. The cutting of a Sequoia for grape stakes or railroad ties (and an eighteen-foot tree was cut this summer for that purpose along the new state highway) is like breaking up one's grandfather's clock for kindling to save the trouble of splitting logs at the woodpile, or lighting one's pipe with a Greek manuscript to save the trouble of reaching for the matches.

After the fall of the Roman Empire the priceless works of classic art were "needed" for lime, and statues by Phidias and Praxiteles were slacked down for this purpose, but the men who did it are today rightly dubbed "vandals and barbarians." What then will the next generation call us if we continue to destroy these priceless trees because lumber is "needed" for grape stakes and railroad ties?

It will cost money to preserve the Redwoods, —many millions; but California has no choice. Either the amount needed to save the groves must be supplied today, or else a far greater sum will be required ten years hence to purchase a butchered and isolated tenth part of the forests. Those are the only alternatives. If the groves are bought in their present condition and at relatively small cost, it will be a great innovation because heretofore Americans have followed the wasteful policy of recklessly exploiting wild life, forests and streams, and then as soon as the destruction is complete, the policy is changed, game is reintroduced and attempts are made to reforest the mountains at vast cost. But Redwoods never can be replaced.

In the negotiations for the purchase of timber lands, the officers of the Redwoods League found sympathetic and cordial support for the park among the lumbermen. They know the value of the timber only too well. The timber is their property, and their business is to cut and to realize on it. It is not fair for a community to ask them to hold this timber, to pay taxes on it and then to sacrifice their financial interests for the public welfare. It is the duty of the county, the state and the nation to pur-

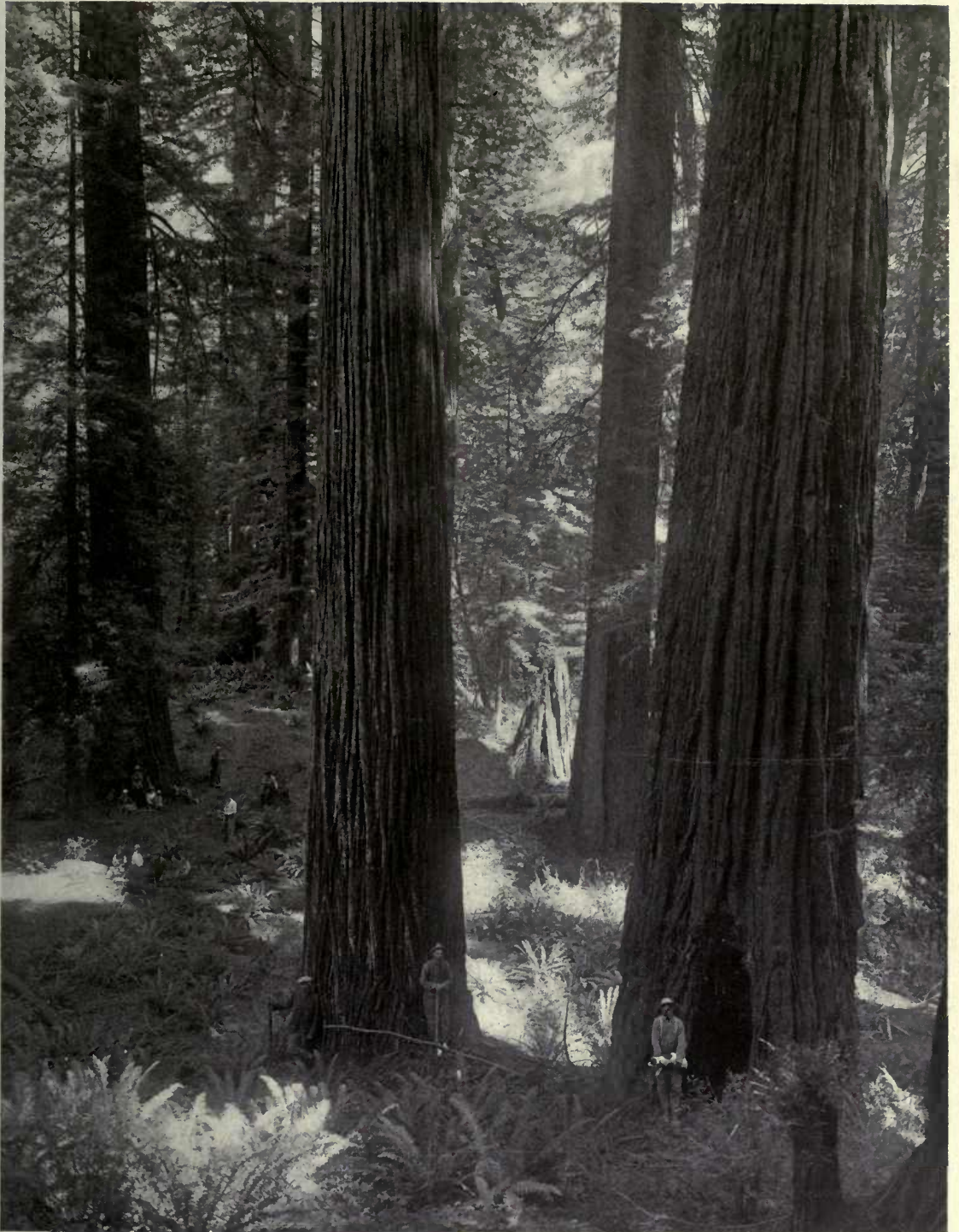
chase their holdings at the proper value. The question involved is not local, it is a state, a national, in fact an international concern, as the benefit derived from the preservation of the Redwoods will be for the people of the nation and the world at large. There is no reason why the lumbermen should abandon their interests without adequate remuneration, although in many cases individuals and companies will donate a certain portion of their timber, or sell at low figures. If the state had been sufficiently intelligent, before building the highways which made the timber accessible, to have approached the lumbermen properly and to have made it a condition precedent that a strip of timber on either side of the road should be donated, no doubt in many cases the lumbermen would have found it greatly to their interest to accept the proposal. The fact that this was not done was the fault of the state, its highway commission and its legislature, and not the fault of the lumbermen.

Experience has shown that the only effective, persistent and intelligent conservators of wild game have been sportsmen who have evolved from game killers into game protectors, and personally the writer believes that the lumber owners themselves, who are among the finest men on the coast, will be found to be most generous and helpful in any scheme looking to the preservation of the timber. The writer says this not out of any desire to placate the lumbermen, but from a genuine belief, based on the character of the men he has interviewed, that this will prove to be the case.

A distinction must be made between the owners who are doing the lumbering themselves, and absentee owners who have no interest in the country, no knowledge of the trees, and who are operating through local agents. These agents have no choice except to obey orders, and the absentee landlords have no interest in the country except to extract an income, and they care not a rap what happens to the land after it has been devastated and plundered.

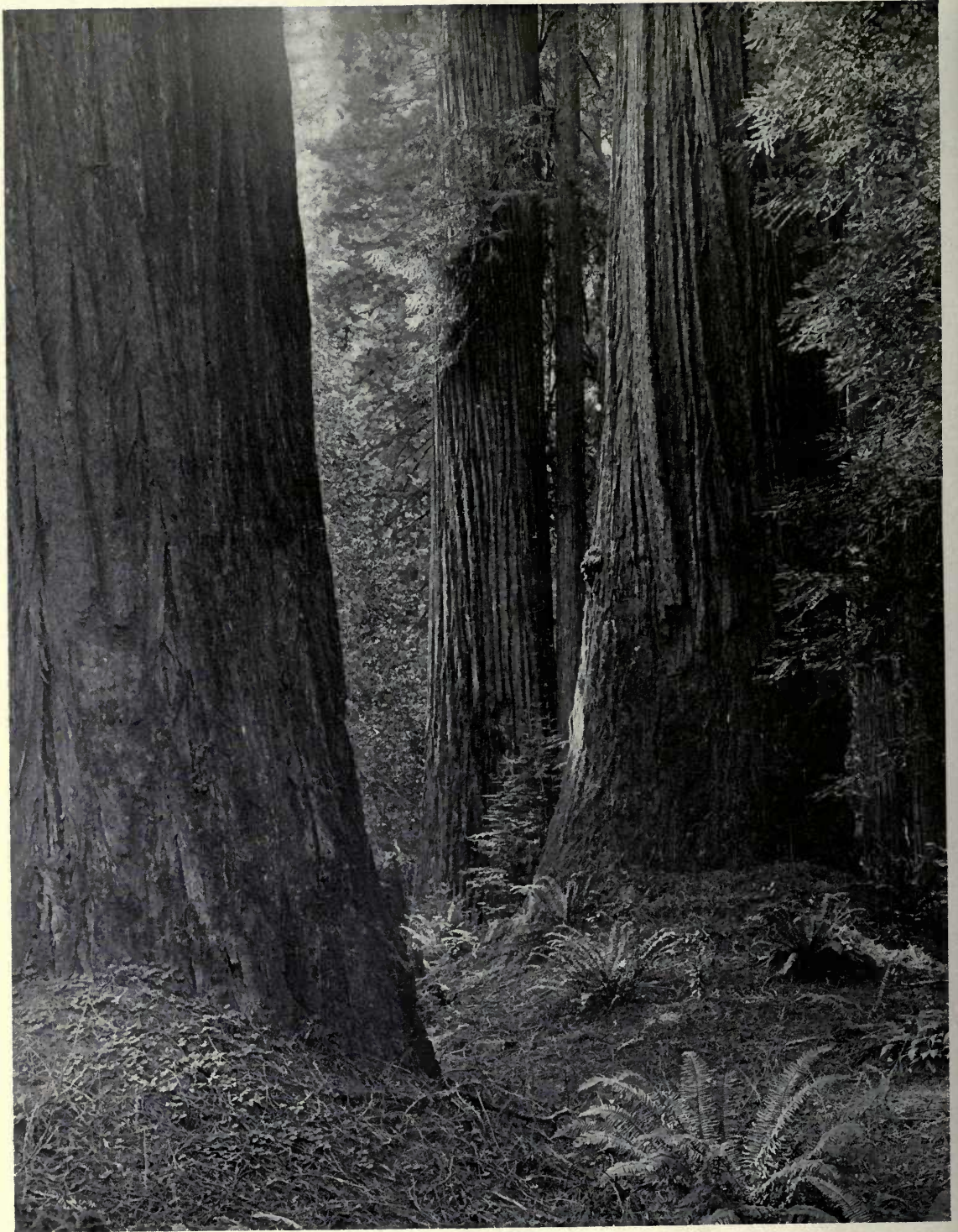
The Redwoods League

Such were the conditions when the "Save the Redwoods League" was formally organized in San Francisco in July 1919. This League had its origin in a trip made in 1917 by the writer in company with Prof. Henry Fairfield Osborn and Dr. John C. Merriam through the groves of Mendocino, Humboldt and Del Norte Counties. The grandeurs of the Bull Creek Flat Grove and its threatened destruction weighed so heavily upon the members of this party that a letter was addressed to Governor Stephens of

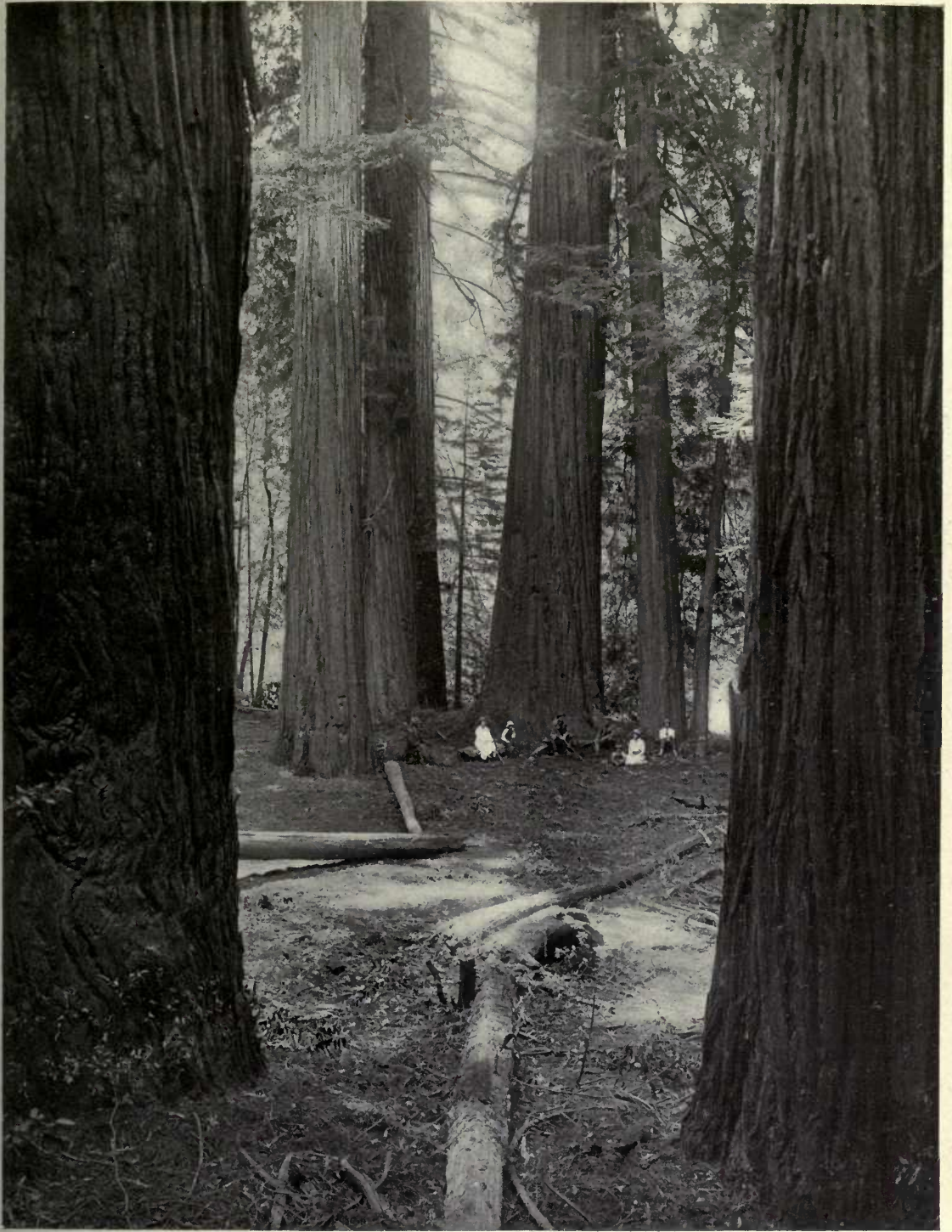


REDWOODS ON KLAMATH RIVER

One of the features of these Redwood forests is the growth of ferns. Courtesy of Charles Willis Ward
(See Page 97)



KLAMATH RIVER REDWOODS
Courtesy of Charles Willis Ward, Esq.
(See Page 97)



CAMPING SITES

Among the Klamath River Redwoods. Courtesy of Charles Willis Ward
(See Page 97)

California, who was about to visit the Redwoods in Humboldt County, asking him to take steps to preserve this stand of giant trees. See page 90.

During 1918 the writer again went to California and endeavored to interest the California Highway Commission in securing a strip of timber along the new highways, but owing to the war and other causes no substantial progress was made until the winter of 1918-19, when Dr. Merriam and the writer finally succeeded in enlisting the support of a group of patriotic Californians in the proposed League, which was then organized as follows:

President

FRANKLIN K. LANE

Secretary and Treasurer

ROBERT G. SPROUL

Executive Committee

JOHN C. MERRIAM, Chairman

Madison Grant	Henry S. Graves
William E. Colby	Stephen Tyng Mather
George M. Cornwall	Ralph P. Merritt
Wigginton E. Creed	Charles F. Stern
William H. Crocker	Walter Mulford
William Kent	Benjamin Ide Wheeler
Henry Fairfield Osborn	Ray Lyman Wilbur
Frank S. Daggett	Charles B. Wing
Joseph D. Grant	Wilbur L. Jepson

This League is at present under the active direction of Dr. John C. Merriam, of the University of California, Berkeley, California, and to him all applications for membership should be addressed.

Subscriptions also of any amount are greatly needed.

The purposes of the League are as follows:

- (1) To purchase Redwood groves by private subscriptions and by county bond issues.
- (2) To secure a state bond issue to buy the finest Redwood groves along state highways.
- (3) To establish through Federal aid a National Redwoods Park.
- (4) To obtain through state and county aid the protection of timber along the scenic highways now in course of construction throughout California.

(5) To encourage the state to purchase cut-over Redwood areas for reforestation by natural means, or by replanting where repeated fires have made sprout reproduction impossible.

Committees have been formed to study the subjects of Redwood distribution, variation and the most efficient commercial use of Redwood products, in the belief that nearly all the purposes for which this lumber is now used can be adequately served by second growth trees.

A committee of ladies has been formed and the assistance of automobile and other associa-

tions and clubs in California has been enlisted.

The salvation of these great trees probably will depend on two factors just entering into active political life,—one the automobilists and the other the women voters. The California Redwoods League is primarily indebted to two men, Stephen Tyng Mather and William Kent, for the funds to start work. These gentlemen guaranteed \$10,000 and thus made possible the preliminary organization and later made other subscriptions as described above.

Conditions in Oregon and Washington

After leaving California Mr. Mather and the writer traversed the entire breadth of central Oregon and Washington, motoring up the east side of the Cascades, down the Columbia highway to Portland, and up the Cowlitz Valley to Mount Ranier in Washington, thence southward through the Willamette Valley in Oregon, over to Klamath Falls and then south through the Pitt River Cañon back to San Francisco, a total of about 2,200 miles.

Preliminary steps were taken for the organization of leagues in Portland and in Seattle, under the direction of the ablest men on the coast. The objects in view were to preserve the timber along the main roads and along the shores of lakes and rivers, and to protect by the establishment of state parks the high peaks and crests of the Cascade Mountains. Both Oregon and Washington are constructing a system of great highways without adequate protection to the scenic features along the route.

Among other purposes in view are the extension of Crater Lake National Park to include the Diamond Lake region, so that the finest game district in Oregon can be protected as a game sanctuary. Crooked River Cañon also is under consideration as a national monument or state park.

Burney Falls in California should be preserved as a state park, but this is a matter outside of the scope of the Redwoods League and must be handled by the state. The sale of the wonderful beach road south of Monterey, known as the Seventeen Mile Drive, and the threatened destruction of its extraordinary cypress forests, unique in the whole world, for a real estate development scheme is another state matter which must demand attention.

The most immediate need in Oregon and Washington is for highway commissions of greater vision than those that are now constructing roads in accordance with obsolete methods. The state highway leading from Tacoma to Mount Ranier recently ran through the welcome shade of giant pines and firs, but



STATE HIGHWAY THROUGH THE REDWOODS. HUMBOLDT COUNTY, CALIFORNIA, IN 1917
Photograph by the Freeman Art Co., Eureka, California

the Washington Highway Commission cut a swath 300 feet wide and then burned the timber against the adjacent forests instead of in the middle of the strip. The result is that one drives for miles through a blasted desert of burned and twisted stumps of what was once a magnificent forest, while the trees on either side have been needlessly scorched and charred with fire, and are frequently girdled by the steel ropes used by the contractors as supports for derricks. All this is reckless waste, and the only defense that the writer heard was that the inhabitants of the state had not yet awakened to a realization of the value of trees and that road builders have "always cut a wide strip for a road so that the sun could dry the mud." The fact that modern roads are concrete and do not need drying has not yet come to their attention. The old-fashioned method of burning underbrush to "improve the forests," an inheritance from Indian days and locally known as "Piute forestry," is still in the ascendant.

The great fight, however, of both the Oregon and the Washington Leagues will be to induce the state not to build highways through timbered tracts *unless a strip of timber on either side is first secured as part of the right of way*. Such an arrangement nearly always can be made with the owners of the timber if the reservation of a strip of trees is made a condition precedent to the construction of the road. A notable example is the new highway now under construction from Ashland to Klamath Falls, Oregon, through some thirty miles of sugar and yellow pine and Douglas fir. If the trees are preserved, this will be one of the most beautiful roads in the world; if they are cut, the road will pass through a desert.

On the whole, the results of the summer's work,—the complete organization of the League in California, and the start made in Oregon and Washington,—have undoubtedly inaugurated a movement which will have far-reaching effects. The energy of the earnest and able men now in charge of the California League, and the tremendous popular support behind it, probably will solve the problem of the Redwoods of Humboldt County. The forests of the north may have to await action by the federal government; but if the trees along the south fork of the Eel are saved, public sentiment will be overwhelmingly in favor of their preservation.

The task of the Leagues in Oregon and Washington will be harder. The population is less dense and has far less respect for trees. The magnificent Columbia highway, which is prov-

ing to be a profitable investment for Portland, may serve as an example, but even there the promoters failed to secure the land along the right of way and will have to pay out large sums to secure the continuance not only of the forests but of the water supply of the falls along the route. The borders of the highway with its trees could have been secured at the start with but small expenditure. When lumbering operations have completed the destruction of the timber on the mountains above the highway, and Multnomah Falls shall have dwindled away, Oregon probably will awaken to the necessity of preserving such scenic features as then remain intact.

In Washington, the contrast between the cool and wooded road within Mount Ranier National Park, which has been built without injury to the trees, and the devastated horror which the State Highway Commission has constructed outside of the Park boundaries, inevitably will strengthen the hands of the Washington League and perhaps enable it to save the trees along the highway between Tacoma and Seattle, where beautiful forests at the side of the road are now sacrificed for fire wood.

As this goes to press, the welcome news comes from Bend, Oregon, that the Shevlin-Hixon Lumber Company is considering the creation of a memorial to the late Thomas Shevlin by the dedication of the timber in Tumalo Cañon and perhaps along the highway to the purpose.

With the co-operation of Col. Graves and the Bureau of Forestry, other stretches of timber along new roads may thereafter be set aside systematically so that the Forest Reserves as well as the National Parks can be utilized by the public as driveways and camp sites. The increase of motor traffic especially along the proposed system of highways to connect the important national parks in the far west will make these proposals widely popular.

Throughout the Pacific states there are everywhere evidence of the old competition between the growing enlightenment of the people and the forces of destruction. Old frontier conditions have passed—waste of natural resources, scenic or otherwise, sooner or later will be checked and a proper appreciation of the value of an undeveloped nature will succeed—but the problem of today is to save for coming generations some substantial portion of our national endowment.

The author desires to make special acknowledgment to Mr. Chas. Punchard, the talented landscape architect of the National Park Service, who accompanied Mr. Mather and himself for many of the photographs used in this paper.

New York Zoological Society

THE NEW YORK ZOOLOGICAL SOCIETY is a private scientific association which, under contract with the City of New York, is vested with the sole control and management of the New York Zoological Park, and of the New York Aquarium.

The Society is national in scope and appeals to all Americans who are interested in the preservation of our heritage of wild life. The forces at work for the destruction of animals and birds are multiplying rapidly, and the Society believes that great efforts are necessary to preserve and protect the remnants.

To those who are interested in the study and preservation of all forms of wild life in North America, the Society offers an economical, efficient and permanent organization devoted to that end. The work contemplated for the future is as follows:

1. *Endowment Fund.*—The increase of the present Endowment Fund is the most imperative need. Without a substantial addition, either by donations or bequests, the Society will not be on a satisfactory financial basis, and its work will continue to be hampered for lack of funds. The present Fund is less than \$375,000.

2. *Zoological Park.*—Development of the Zoological Park, 264 acres in extent, and the care and increase of its collection of over 4,000 animals.

3. *Aquarium Development.*—Development and administration of the New York Aquarium, and the extension of its marine exhibits of nearly 6,000 specimens.

4. *Aquarium Improvements.*—The alteration of the present Aquarium Building so as to remove the boilers that are daily flooded at high tide, to a site outside the present building. The space then could be devoted to additional exhibits. Several more rooms are needed, also, by the administrative force, and for research work in connection with the scientific utilization of the immense mass of gross material that is available. This change would cost upward of \$100,000.

5. *Pension Fund.*—The enlargement of the Permanent Pension Fund for employees. The Society's contribution to the present fund is \$8,000, of which \$4,335 is derived from a fund of \$100,000 provided through the generosity of the late Andrew Carnegie. An additional \$150,000 is required to provide adequate relief for widows, the permanence of the present pension plan and to relieve the Society of its annual contribution of \$3,665.

6. *Tropical Station.*—Maintenance of the Tropical Zoological Station in South America for study and research work in tropical life, the publication of the scientific results obtained, and as a source of supply for the Park and Aquarium collections.

7. *Publication.*—Scientific studies on the care of wild animals and fishes in captivity. This work should be accomplished in 1920.

8. Publication in *Zoologica* of a series of scientific articles of great value on living animals, and in *Zoopathologica* of medical and pathological material on the diseases of wild animals.

9. *Pathology and Anatomy.*—Research and investigation in pathology and anatomy through the Prosecutor's department.

10. *Photographs.*—Publication in permanent form of photographs taken at the Park of great value to science.

11. *Wild Life Paintings.*—Completion of the gallery of oil paintings to include all American species of large mammals and of such other mammals and birds as are threatened with extermina-

tion. These pictures are of great artistic merit and are prepared from accurate studies gathered in the habitat of each animal. Nineteen pictures already have been completed and hung in the Administration Building.

12. *Heads and Horns Museum.*—The erection and equipment of a museum on Baird Court to contain the National Collection of Heads and Horns. This Museum will be open to the public, and will contain the present collection of 870 specimens, which is already of unique value, as many of the species represented are verging on extinction. Under existing conditions abroad, the Society will have the opportunity of securing many record specimens at low prices. The fund has been partly subscribed, but more will be needed to increase the variety and number of the collection.

13. *Zoological Library.*—Establishment of a zoological library, greatly needed for research work at the Park. It is the intention of the Society to install in the library at the Zoological Park all the literature available, that relates to the present world-wide conservation movement. The literature on this subject is widely scattered, but the best of it should be gathered and made available for those engaged in preserving our heritage of wild life and forests. Adequate funds have not been available for the library, and scientific work, even for the identification of specimens, has suffered accordingly.

14. *Game Protection.*—Establishment of Game Sanctuaries in the National Forest Reserves. This is the most practical plan for permanently protecting American wild life. The success of the Yellowstone National Park as a game sanctuary has been abundantly demonstrated.

15. *Game Protection.*—Maintenance of existing game laws, and the extension of laws prohibiting the sale of game, spring shooting, use of automatic guns, and in the promotion of closed seasons for species threatened with extinction. Appeals for financial help for these causes are constantly received from all over the United States and Canada.

16. *Stream Protection.*—Many of the finest American rivers and streams have been polluted by dye waste, chemicals from pulp mills, sawdust, sewage from towns and villages, and other defiling and poisonous materials. The result has been the destruction of many valuable and interesting fishes, notably salmon and shad, and the transformation of beautiful woodland streams into a menace to public health and a blot on the landscape. The Society intends to attempt to abate these evil conditions and prevent their extension, as soon as funds are available.

A Notable Event for Bird Lovers
"The World's Most Perfect Zoological Monograph"



TEMMINCK'S TRAGOPAN, *Tragopan Temmincki* (J. E. Gray)
(Specimen color-plate from volume one)

A MONOGRAPH OF THE PHEASANTS

By WILLIAM BEEBE

Published by the New York Zoological Society, through the co-operation of Col. Anthony R. Kuser.

To be completed in four royal quarto volumes, richly illustrated with reproductions in color of paintings by Thorburn, Lodge, Knight, Fuertes and Jones, also many photogravures and maps. It appeals equally to the layman and the scientist. Only 400 copies are available for sale in America. Volume I is now ready for distribution. Price is \$62.50 for each volume.

Prospectus, specimen plate and subscription blank will be mailed on application.
ZOOLOGICAL SOCIETY, ZOOLOGICAL PARK, NEW YORK CITY.

GENERAL INFORMATION

ABOUT THE

New York Zoological Society

MEMBERSHIP IN THE ZOOLOGICAL SOCIETY

Membership in the Zoological Society is open to all interested in the objects of the organization, who desire to contribute toward its support.

The cost of Annual Membership is \$10 per year, which entitles the holder to admission to the Zoological Park on all pay days, when he may see the collections to the best advantage. Members are entitled to the Annual Report, bi-monthly Bulletins, *Zoologica*, *Zoopathologica*, privileges of the Administration Building, all lectures and special exhibitions, and ten complimentary tickets to the Zoological Park for distribution.

Any Annual Member may become a Life Member by the payment of \$200. A subscriber of \$1,000 becomes a Patron; \$2,500, an Associate Founder; \$5,000, a Founder; \$10,000, a Founder in Perpetuity, and \$25,000 a Benefactor.

Application for membership may be given to the Chief Clerk, in the Zoological Park; C. H. Townsend, N. Y. Aquarium, Battery Park, New York City, or forwarded to the General Secretary, No. 111 Broadway, New York City.

ZOOLOGICAL PARK

The Zoological Park is open every day in the year, free, except Monday and Thursday of each week, when admission is charged. Should either of these days fall on a holiday no admission fee is charged. The opening and closing hours are from 10 o'clock A. M. until one-half hour before sunset.

NEW YORK AQUARIUM

The Aquarium is open free to the public, every day in the year: April to September, 9 A. M. to 5 P. M.; October to March, 10 A. M. to 4 P. M.

PUBLICATIONS

<table border="0" style="width: 100%;"> <tr> <td style="width: 80%;">Annual Report No. 1</td> <td style="width: 10%;">Paper</td> <td style="width: 10%;">\$.40</td> <td></td> </tr> <tr> <td>" " " 2</td> <td>"</td> <td>.75</td> <td>Cloth \$1.00</td> </tr> <tr> <td>" " " 3 and 4, each..</td> <td>"</td> <td>.40</td> <td>" .60</td> </tr> <tr> <td>" " " 5 " 6, " ..</td> <td>"</td> <td>.75</td> <td>" 1.00</td> </tr> <tr> <td>" " " 7 " 8, " ..</td> <td>"</td> <td>1.00</td> <td>" 1.25</td> </tr> <tr> <td>" " " 9 " 10, " ..</td> <td>"</td> <td>1.25</td> <td>" 1.50</td> </tr> <tr> <td>" " " 11, 12, 13, 14, 15,</td> <td>"</td> <td></td> <td></td> </tr> <tr> <td>16, 17, 18, 19, 20, 21, 22, 23, each...</td> <td>"</td> <td>1.00</td> <td>" 1.25</td> </tr> <tr> <td>Our Vanishing Wild Life (Hornaday) postpaid</td> <td></td> <td></td> <td>" 1.65</td> </tr> <tr> <td>Destruction of Our Birds and Mammals (Hornaday)</td> <td>"</td> <td>.15</td> <td></td> </tr> <tr> <td>Notes on Mountain Sheep of North America (Hornaday)</td> <td></td> <td>.40</td> <td></td> </tr> <tr> <td>The Caribou (Grant)</td> <td>"</td> <td>.40</td> <td>" .60</td> </tr> <tr> <td>The Origin and Relationship of the Large Mammals of North America (Grant)</td> <td></td> <td></td> <td>" 1.00</td> </tr> <tr> <td>The Rocky Mountain Goat (Grant)</td> <td>"</td> <td></td> <td>" 1.00</td> </tr> <tr> <td>Tropical Wild Life (Beebe; Hartley; Howes)</td> <td></td> <td></td> <td>" 3.00</td> </tr> <tr> <td>Zoologica Vol. I. 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