The Enjoyment of the Redwoods

by Dr. Paul Zinke, 1965

This is one of a series of five lectures on the California redwood presented by Letters & Science Extension in cooperation with the School of Forestry, University of California. Dr. Paul J. Zinke is introduced by Dr. Nathan W. Cohen, head, Letters & Science Extension and speaks on THE ENJOYMENT OF THE REDWOODS.

Introduction

Good evening, ladies and gentlemen, and welcome to the fifth in the series THE CALIFORNIA REDWOODS. Tonight it's our pleasure to have Dr. Paul Zinke, associate professor of forestry on this campus, as our speaker. Before coming to Berkeley in 1956, Dr. Zinke served as soil scientist for the California Forest and Range Experiment Station of the U.S. Forest Service. Recently he undertook some field work in Italy and Greece which resulted in a report entitled "Mediterranean Analogues to California Soil Vegetation Types." His research interests have been in the areas of forest influence, forest soils, soil morphology, soil vegetation relationships and plant ecology. He is a native Californian. He received his Bachelor of Science degree from this campus in 1942 and conducted field work in Alaska and served in the U.S. Army Ski Patrol in Alaska during World War II. His topic this evening is THE ENJOYMENT OF THE REDWOODS. It is my pleasure to introduce Dr. Paul Zinke.

Enjoying Redwoods

Thank you Mr. Chairman, and good evening ladies and gentlemen. The topic which I will discuss tonight is not necessarily one that will tell you how to enjoy the redwoods, but perhaps remind you of some of the enjoyment you have had in the redwoods and some of the enjoyment other people have likewise experienced there. Now, of course, not all people enjoy redwood forests at all times. And one aspect of this I noticed the other day while walking on a trail in Marin County and I overheard a lady say to her husband, "if nature wasn't so cold I could love it more." Well, I think, with regard to the redwoods, there are people who feel this way. And this non- enjoyment, which I will only dwell briefly on in passing, showed itself up in the literature by John Simmons in 1880 in which he said, "It is impossible to enjoy art or nature while suffering from fatigue and cold, dreading the attacks of robbers and wondering whether you will find shelter at the end of the day."

Well, I don't care to emphasize the negative aspects of non-enjoyment of redwoods, but rather the positive aspects of this subject. And I think this was well stated by Irving in an anthology on the mountain literature that he published in 1938 in which he said, "It is more interesting and pleasant to converse with those who have found a treasure than with those who deny that one exists." I think this also applies to some of the arguments we may hear pro and con regarding the redwoods and our enjoyment of them. In other words, we would rather have enthusiastic than critical appreciation of the scene.

As we become more familiar with the redwoods, we do find that our enjoyment may fade or tend to take different paths, though the first encounter is usually quite an experience for all of us. Emanuel Fritz, the professor of the redwoods, once told me that he wished he could still carry with him the original feelings he had when he first went into a redwood stand. He has taken many visitors on their first visit to the redwoods and in the early days they used to take the railroad and get off at South Fork station at about 5:30 in the morning. And he would take visitors from the prairies or from the eastern states for a walk for about an hour at that stop. They would walk silently through Founders Grove just west of South Fork station. The impressions that most of

them got were most likely lasting ones for the rest of their lives.

I remember taking a German forester, Franz Hartmann of Vienna, out to a grove of redwoods just east of Hammond Grove on the early Hammond industrial forest on the Van Duzen River. When Franz Hartmann got into this grove, which I think is one of the most superlative of all of them, he began to quote Goethe and various poetry from his cultural background and described that forest as being the true primitive forest, the Urwald. Well, it is a struggle to keep this feeling, particularly when I have to become rather schizophrenic in regard to these trees and do impartial, unemotionally biased research work. And unfortunately the other half of my life deals with that subject which I won't emphasize tonight.

But nevertheless, it does bring up that we have a current emphasis on departmentalized science, technology, business. And this sometimes deprives us of an elemental enjoyment of which we are capable as whole human beings many times. Now we get a derivation of the enjoyment as we go into a redwood forest or any forest because that forest is a thing of beauty. It may be an object of mystery. It may represent discovery to us. It may represent knowledge, or just physical exercise and play. And, of course, this is all relative to our feelings at that time and our background and perhaps our age. The ultimate enjoyment of these forests or any forest must be from direct contact with or direct vision of the originals. Direct vision and direct contact of this original is most likely desired by each generation, not just hearsay or having read about these things but having sensed them personally. The opportunity to enjoy the forest and the trees first hand is of course, a primary necessity of many people.

Now the enjoyment of a forest may come first from our primary sensual contacts with it, secondarily from derived concepts and ideals which we get from that forest and from the experience we have with it. Of course, the sensual perceptions would be those based on the sight, the smell, the hearing, the touch and even the taste of that forest. For example, in sight we would obviously see forms, colors, textures, changing lighting, and alterations of lighting. In the case of fragrance, in most coniferous forests, of course, we would have the pitchy or resinous odors or in many of the aromatic hardwood forests, the aroma of these leaves. And in the redwood forest we do have that aroma of moist leaf litter which is quite characteristic of that forest. And we can sometimes duplicate that by merely taking the leaves home, moistening them and drying them in an oven.

We do have sounds in a redwood forest too. And frequently when we are in the forest the air may be calm, but far above we can hear the wind rustling the leaves at perhaps three hundred feet above us, coming down as if it were a chorus of echoes in a cathedral. Even the sound of a truck going by on a nearby highway sounds pleasant as it echoes off the vault of this canopy of leaves. There are some places where we get rather characteristic sounds. And I know of one place near Bull Creek Flat near the Anvil Tree; if one walks into that forest to the south where the trees creak and rub in a certain way, that's the only place where you'll hear that particular sound. It's as if it is a person you know and a particular tree there is rubbing against another one in a certain manner that gives this unique sound at that place. Of course, there's the sound of a storm which fills the entire air and the occasional punctuation of the crash of a tree which is quite a memorable event in these groves.

You wouldn't expect perhaps that touch or feel would enter too much into your enjoyment of the forest. But there are such things as temperature changes and the feeling of the air on your skin, the softness of the trail that you're walking on, and even the touch of the tree, in the case of the redwood the softness of bark, or the sharpness of thorns too when you begin to look at the thimbleberries or the salmon berries in the thicket. Then there's taste too, not so much, but the bitter taste of oxalis leaves or the sour taste of berries or the fresh

taste of good cold water on a warm summer day in these groves.

These sensual perceptions as we go through a forest eventually bring about a harmonious relationship between ourselves and that forest environment. We in effect establish a rapport with the environment. And it seems to be almost as if we are in a dream partly of direct sensual sensations but partly of a rapport such that we see in this environment certain ideas or concepts relative to ourselves. This is easily destroyed by discordant notes as for example, a transistor radio walking by. You may have noticed this yourselves too. And perhaps those people are in rapport with that transistorized radio. But it does some- times destroy the rapport which you may have had. This rapport brings with it certain second-order sense perceptions, concepts and ideas -- such things as beauty, mystery, discovery, knowledge, uniqueness and novelty might be involved.

For example, perhaps along the mystery or the discovery lines, we have a sense of time and continuity in most of our redwood forests, either the Sierra Big Tree or the coast redwoods. Because of the time scale involved in the lives of these trees, perhaps from 1,000 to 3,000 years, a million days in the case of the older trees, we find that this is a time scale worthy of the time scale of our own written history as human beings. And it does give us a sense of historical continuity to be in these groves at the particular time we're there and think back on them as originating at some time in the past that is perhaps primitive in our own written history. This gives rise to a feeling of stability and sometimes security because we see that the old redwood is a monument to the stability of the environment or of living beings and their capability of adjusting to the environment.

This was noticed by Thomas Edison, who in an article in 1926 in The Forum magazine noted that he felt the ability of these redwood trees to survive for such a long period of time, any one tree, perhaps represented a good adjustment between the environment and that tree. And the environment either created by the tree in its own forest or in the optimum situation in which it was growing would not exceed the limits of the ability of that tree to survive. And it was, Edison felt, the fitness of that environment which allowed the longevity of that tree. He went on to generalize that perhaps that applied to humans also as living organisms. Well, in effect we find that we have a tendency to uplift our thoughts when we are in rapport with these trees and if we were to travel on a trail, for example, where we see crowds of people, we find that the conversation among many of them drifts to subjects that are many times fairly serious. That is quite interesting, to overhear the conversations between people that are traveling in these forests.

Now the enjoyment of these trees is perfectly relative, of course, to our own background. As an example of some of the enjoyment which one can get, Galen Clark wrote in a book regarding the Big Trees in the Sierra Nevada that in order to really enjoy those, one should travel through them in a six-horse stage and that until you had done this you really couldn't enjoy those trees. Most of us now are denied this opportunity and we can't have that direct contact with these trees that a six-horse stage would give us. Nor ride on one of the large logs and have that feeling of perspective from the stage. Well, it's apparent then that we do have some aspects of relativity in this enjoyment. Perhaps now we would want to do it with a sports car and perhaps a decade ago in a Lincoln or a Cadillac.

The early impressions of the redwoods were apparently conditioned by just the sheer novelty of them and the large size and the fact that most people were new to California and were bragging about it. The literature in the first half century is dominated by expressions of awe at the size of these trees. People would write and even begin to ship sections of the trees east and to Europe to be exhibited to show the immense size of the trees. Well to give you some idea of this size, even here we'll do some bragging -- since I'm a native I guess I should brag about the trees.

The largest diameter of a coast redwood tree is just 27 feet. This is the Reed tree in the basin on the north fork of the Mad River. Mr. Reed, one of the directors of the Simpson Timber Company, saw it recently on a trip in a forest that was being harvested. And he felt that of all trees that one should be saved by the company and it is at the present time. The Reed tree is 27 feet in diameter and it is a monument to Mr. Reed. The General Sherman tree, a Sierra redwood, has a diameter of 37 feet, 10 feet more than the Reed tree. I'm calling it the Reed tree on my own initiative.

In the past, people took cross sections of such trees and mounted them in rooms and auditoriums in the eastern United States and at the Paris International Exposition, I think in 1870. Everybody in those areas thought these were hoaxes and didn't believe this at all despite all the effort on the parts of our native boosters here to put this point across. I think at the present time our interest in these trees stems less from their novelty than just from the sense of beauty and other concepts we get from them, and the contrast they make to our present urban life, and perhaps a time perspective they give us in relation to the pressures of this life.

You can't really compare the magnificence of any of these groves until you have seen both the Sierra Big Tree and the coast redwood, said Walter Frey. The Sierra Big Trees just seem to push up -- nothing can stand in their way. Occasionally, they're planted as though there just couldn't be any more in the same space. And the light just seems to echo off of each tree. And there are areas of intermediate-age forest in which the trees still maintain much of their youthful vigor although they are extremely large.

Now it isn't only in the summertime or the autumn that we see them, we see them in the winter when the color of their bark is certainly the most obvious color in the forest. And perhaps one of the most enjoyable speed tours we can make is through one of these groves after a fresh snow. But then in the autumn too the color is nice and we see the trees as if through windows of leaves. And we begin to be acquainted with some of the associated species. And we see that not all the enjoyment of this forest is just due to the Big Tree. Other trees that we find with it are the sugar pine, or the incense-cedar or the hardwood trees with their various colors. Each of them becomes an individual and each one is enjoyable for different attributes -- the incense-cedar with its shining foliage, the big leaf maple with its yellow foliage at that time of the year, and of course, the ever-present dogwood.

In one of the management attempts that have been made in these forests, most of the understory trees other than the Big Tree were harvested. In the disturbance that followed this harvesting, large numbers of young Big Trees came up. In fact, they were so dense in this particular case that on the forest concerned a Christmas tree sale was made of Big Trees. This points out one other aspect of enjoyment -- people do enjoy Big Tree Christmas trees in some parts of our state. From Mountain Home Forest and immediately to the south there are Big Tree Christmas tree sales. But the objective of some of this was not just to be harvesting trees for money, but to see if one could open up the forest for vistas of the Big Trees, because there has been some concern about the growth of the young under-story vegetation to the extent that one could not see the large trees. Another forest was opened up with only the biggest of the Big Trees left standing, and all the intermediate-size conifers, small ponderosa pines or white firs, cut out of the stand. You begin to get an idea of the scale of the forest when you see these Big Trees scattered across the landscape, perhaps at one or two to the acre.

The Big Tree has vitality too, much like the coast redwood. Cambium grows over some of the stumps where young trees were cut. And eventually sometimes bud sprouts will come out of this stump and the tree will grow a new leader. But everything must come to an end, even with such a tree and in a time scale in which it lives. The tree known as Uncle Tom's

Cabin fell this autumn in Calaveras Grove. It's almost a cosmic scale of wreckage. Scattered across the forest are 300 feet of growth and tree trunk and large chunks of wood that are shattered and the bright, flame-like appendages of the portion of the tree which remained in place from which that tree fell, leaving a huge log about 22 feet in diameter. There was one spot where this log lay over another one which also was about 20 feet in diameter and it made a wall nearly 40 feet tall. And it was interesting to look at that and think what some ancient civilization might have done with these types of logs in fortifications or in temples or some other construction work.

The Sierra Big Tree used to be called redwood also. And many people still call it redwood because of the color of its wood. It's a lighter colored wood than the coast redwood and it has a sheen which some people feel is more pleasant than coast redwood. Nevertheless, both woods have this attribute of a pleasant red color.

At times, you find you are stopped on small roads that are nice to venture into the forest on. We once stopped by a tree that had fallen across our road. And when we climbed up and looked on the log, we found that we were 200 feet up the tree. The lower part of the tree was 200 feet farther down the slope. Even at this point though, 200 feet up the tree, it was slightly more than eight feet in diameter.

This was a tree that was 1,200 years old. This happened to be in Whittaker Forest and Woody Metcalf, one of our professors emeritus, calculated that as these trees were falling at the rate of about one every other year, we would lose our forest by about 1,000 years from now. By the way, we are now sawing up the wreckage of that tree to understand the so-called nutrient balance of such a large tree in relation to its size. In doing so, we gathered up all of the cones that this tree had produced and it amounted to about 56 very large, 50-gallon drums full of cones. So even when those trees are on the ground they are objects of curiosity and interest.

Many of us just enjoy walking around them and seeing how big they are, such as the Los Angeles Tree which fell on the Mountain Home State Forest. It was called the Los Angeles Tree because to satisfy the curiosity o£ people at the Los Angeles County Fair, a section of it was cut out and shipped down to the fair, and is still on exhibit there in Pomona. Even after the logs have been in the woods for perhaps 100 years, they still remain as objects to be appreciated. As John Muir noticed, they seem to sink gradually into the soil until they are in troughs. And sometimes they hollow out and many of us enjoy just walking through them.

In the early days -- a job which we apparently can't savor now -- people used to ride their horses three or four abreast into these trees, 30 or 40 feet into their interiors. Or they even danced on them. Thirty-three couples danced on the stump called the Centennial Tree at Calaveras Grove. And besides that, the orchestra was there too. It may have been just a fiddle and a comb with paper over it, but, nevertheless, they were dancing here. And for those who didn't like to dance, a log extended into a long tree trunk. It was leveled off and a bowling alley was made on that tree. So you can see there are diverse ways to enjoy redwoods and Big Trees. Even the standing snags are of interest. And I think some- times naming the trees is interesting and enjoyable to some people. Even after the logs have fallen and have lain there for centuries, they still add beauty to the forest.

And now for comparison, it would be of interest to consider the coast redwoods. Of course, they have been known for a much longer time, as in the case of explorers out of the San Antonio Mission in the mountains south of Monterey who discovered some September 10, 1773. Course, at that time people were concerned more with just survival and so the emphasis here was that the redwood is very good for building purposes. And, perhaps, there were Indians to carry them the long distances, too. And that's evident when we go to Fort Ross and see the church there that is built out of redwood.

However, I think now that much of the emphasis for enjoyment of the redwoods is on the beauty of the region and of the trees and forests themselves, such as at Gold Bluff Beach along the North Coast. Or at Patrick's Point just north of Eureka, looking back to the north on the main redwood belt, which in that area is only about 10 miles wide, with Starwine Ridge snow-clad in the background in back of the redwood belt, or a few miles south at Trinidad, where we look across the redwood forest area on Snow Camp Ridge in the background back of the redwood belt.

I think what you see, too, in the Redwood Region is, perhaps just as in the High Sierra occasionally one enjoys the high mountain country, that there we enjoy the ocean scenery in contrast to the redwoods or sometimes in conjunction with them. So we have many parks to enjoy here, encompassing beach scenery, such as the one at Trinidad. And we have coastal scenery which extends from Big Sur coast up to a point near Fort Bragg and Westport, and fishing harbors to enjoy, and also some very rugged coastal country. Part of the coastal country that has cliffs, some of the largest on the Pacific Coast, towering up to 2,800 feet on Land Cliff just north of Shelter Cove or near King's Peak. The cliffs above the beach at Bear Harbor are up to 2,000 feet above the ocean. And there is enjoyment there just to fish for surf fish. And as a man dips his net on a wave, he may be getting a fifty-pound load of fish in that net, ocean trout for example.

There are interesting towns that are tucked away and that many people do not get to, such as Ferndale, in the Eel River Valley, with its tall church spire. And most interesting are its old vintage buildings which are preserved almost as if in a museum. The towns-people have painted these even though the stores are vacant in many of them, just for their attractiveness and because they wanted a pleasant town to live in. There isn't much tourism. These people just enjoy their wooden buildings and the art work they have in them, as in Ferndale. By the way, one of the nicest bakeries in California is in Ferndale and makes excellent macaroons at this time of year for Christmas -- it is run by an old Swiss baker.

Well, now to the forest which is probably the reason we have gone to this region to enjoy it -- the redwood forest. To look at the panoramic view of the redwood forests, there are few better places than Bull Creek across the upper part of the Bull Creek grove. There one gets that feeling that Thomas Edison had, that these trees are almost like something out of phase with current time, perhaps creating their own environment and existing there almost as if they were an iceberg far out in the tropical or warmer parts of the ocean. They seem to be out of phase particularly, because if one were to look to the right here, he would see no redwoods, but mainly either warm open grassland or hardwood forests or Douglas fir forests. Then there are slopes for miles with a wilderness type back country which not too many people use on the north slope of Grasshopper Peak. There is a road and there are many trails up to a place called Canoe Creek or Tie Camp up along and down these slopes.

Another place where we get panoramas of redwood forests is on the road to Schoolhouse Peak up north of Redwood Creek, near Oregon. And there are many redwood forests lower down in the canyons and on the opposite side of that valley for many miles where the world's tallest known tree is located. Closer and more intimate with the forest are the California Federation of Women's Clubs Grove, the south fork of the Eel River, and Rockefeller Forest. I think there still is some prospecting to be done for the world's tallest tree, although people do feel now that the 367-foot one on Redwood Creek might be it. There is a good candidate towering 25 feet or more above the other canopies in the Federated Women's Clubs Grove. I think Professor Bruce, when he was teaching forestry here in the twenties, once felt that he had seen a tree or he had measurements of a tree that was taller than the Founders Tree on Dyerville Flat. And he had it from a point such as this one, which, by the way, is on top of a massive road cut, but does offer some of the best panoramic views of the

redwoods you can find. But now that we have had this opening made, it would be a good point to go back and measure some of these trees and get a closer view of those -same trees.

Up some of the rivers the scenery is unique perhaps to the coast redwoods. Along the south fork of the Eel River come in order hardwood forests, young redwood forests and then the old redwoods. There's a story to tell behind the young redwood forests along the rivers and we'll soon hear of that. But this river scenery is what I think makes the coast redwoods uniquely enjoyable perhaps, such as up on the Van Duzen River. In that case, the forest is an industrial forest belonging to the Georgia-Pacific Company. Much of the area has been harvested and logged and second-growth timber forms the backdrop for our river scenery.

And at sunset on the south fork of the Eel River near Children's Grove, even the twilight adds life to these forests along the rivers. Many times we find that we are disappointed and although I didn't want to deal with the non-enjoyment of the redwood, sometimes we plan a weekend trip or a week up to the redwood country and we find that the weather is quite as bad as in some of the early pictures I've shown you. But you can begin to learn to enjoy this country in the rain too. And you may have a week of rain on your hands and you'll find that there are enjoyable scenes in these forests even during these rainy periods. And, in fact, one begins to feel that perhaps these periods are as interesting in these forests as the dry ones, for the forests take on a different atmosphere at this time.

And as one goes into the groves, although the rain outside was like a mist, the drops in the groves may be as big as your fingernails or nearly a quarter of an inch in diameter and dropping like plummeting comets through the forest in contrast to the rain outside and giving us sounds on the wet leaves underneath that we wouldn't have heard before. Later comes the flood and many of our rivers then rise. Because some of this country is the most erodable in the world -- it being a unique terrain of clay, clay stone, sandstone and very erodable terrain particularly up in the head waters area, back of the redwood country -- we find our streams rise muddy at that time.

But it's these streams which give us the border, such as that along the south fork of the Eel River, of our hardwood trees and young conifers, redwoods, next to the old wall of trees. And these walls begin to be very interesting as we see at Founders Grove near Dyerville Flat or up on the Van Duzen River at the Hammond Grove, now I think called Georgia-Pacific Grove. There we have trees more than 300 feet tall, up to 340 feet in this grove, I believe, they were recently measured. And then the young redwoods come up near them and then cottonwoods and sometimes tanoaks grow near them. At Stevens Grove, we get the full effect of the back- drop ridge effect as well as those borders of hardwoods young redwoods, tall redwoods, and then a mass backdrop effect of redwoods up the slope. Ruskin once said that part of the beauty of a forest was the sheer redundance of the foliage. There's just so much of it. It's almost like a luxury and you're there to enjoy it.

Sometimes these edges aren't quite the same as those with that complete-entourage of hardwoods, young conifers and then the tall redwoods, for occasionally the banks are being cut into. At one point there is an abrupt opening into an old forest at the point where the streams are cutting. On the side where the stream would be filling in, that's where we would probably get that complete border effect. The stream is not cutting the border of hardwoods and where it is cutting, etching into the forest, into the old stand, we get to see glimpses of the interior from its margin. Now that margin takes on all sorts of attitudes depending upon the lighting. Or occasionally, the radiation fog begins to form in the valleys and we begin to conjure images of strange places as we look across these forests. Now we don't always have river margin forests. Occasionally we may have lakes or lagoons to margin or reflect our forest as at Big Lagoon north of Pat-

rick's Point. And also we have Sitka spruce sometimes forming a margin along with redwoods.

Now let's get to the individual trees. Normally as we travel through the redwood forest, we don't see such giants as the 27-foot-thick Reed tree in the coast redwoods. But we just enjoy many different types of tree trunks and their textures and colors, very large trees, perhaps up to 5 or 10 feet in diameter and illuminated by the lighting which filters through the canopies. And they have different color effects too because sometimes these are river bottom forests and we may have past flood effects in which sediment or silt was deposited against the trees, which gives them a muddy color occasionally, or then growth -- lichens and other algae -- may be on this to give us a color which is different than the reddish brown bark we may be used to, a variation in color from the green to the red-brown. And when it's lighted by the sun flecks which flow across the forest, sometimes we have an orange glow. Occasionally the trees lean and develop what is called compression wood, and give us texture defects on the bark as with the Anvil Tree in Bull Creek Flat. That tree had to keep up a running race to keep cropping itself with its advancing prow against the lean which was gradually occurring far above on the tree.

The bark and the form of the trunk are not all that we have with the coast redwood. The foliage shows up. And this is a foliage that seems to be a more lively colored foliage than that of the Sierra Big Tree. There are proponents of both trees, and we see in the literature people, like Bret Hatte for example, who felt that this tree was the poor country cousin of the Sierra Big Tree, but others who felt this tree represented youth, vivacity and bright colors. And sometimes with this coast redwood foliage we may have accent colors of the toyon berry. As you walk around here on the campus, you may notice that the landscape architects have planted toyon berry next to Big Tree foliage to give this contrast here in captivity. The tree trunks themselves may be accented by the softness of hardwood foliage as with Oregon crabapple, or by the drooping of Sitka spruce foliage, forming a haze of gray-blue green. Occasionally we find these Sitka spruce way out on the coastal rocks away from the shore. The Sitka spruce takes the ocean salt spray much better than the redwoods so we generally find it forming the forest margin toward the ocean. And then the red alder adds accents of white bark to the redwood forest. When we go inland, if we take a whole region to enjoy, we find oak forests and groves in among the grass openings on the ridges above the redwood forest as with the black oak groves near Bell Springs and above Clear Lake. Associated with the black oak we have garrya oak sometimes giving grotesque forms on these high ridges.

Now a large part of our enjoyment, of course, will come from walking through the forest and just sensing it physically, and enjoying the physical amenities that forest has to offer us. Much of the enjoyment of the forest comes from this amenity aspect of the forest; that is, the aspects from which we do not derive physical benefit in terms of material goods. There has been quite a history of amenity forestry developed.

There are some redwood forests along the high bluffs near Wolf Creek looking out from a vista into the ocean area. That happens to be one of the areas proposed for a national park. As you know, there are quite a few park proposals current in the redwood country at the present time. Indian Creek is part of that same area with its margin of red alders and then the redwood forest on the uplands above it. Coming into the redwood too we find that walking into the groves we may find waterfalls or streams coming through them as at Lane's Flat, or nice creeks such as Prairie Creek, and of course, the south fork of the Eel, the large streams.

Well now let's consider a typical walk in the forest and see what there is in the way of visual impressions. We'll take a trail up in Prairie Creek that gives us some of the feel of a forest This trail gives us a nice soft tread on freshly fallen leaves that is typical of a redwood forest. We pass a kaleidoscope of color, tree trunks of

different texture and under-story vegetation of ferns and huckleberries, and at openings we look out at cathedral-like glades. We see trees of various forms and shapes, and a massing of foliage as in Muir Woods, and occasionally cathedral-like groves consisting of just the Big Trees alone.

This brings to mind the gift that a Japanese peasant gave to an emperor about 1,000 years ago. He had nothing to give in the way of wealth and instead he planted two rows of cryptomeria trees along each side of a road for one mile. These trees now 1,000 years later, equal the redwoods in size and are one of the most magnificent tree groves in the world. Perhaps we can leave to our future generation trees such as these by some way or other bringing along the young-growth that is now occurring along the river flats.

As we look up into the redwood trees, we see a massing of foliage, typical of the Sequoia on the coast. But then down in the under-story, we find all kinds of variety such as the big leaf maple, or the dogwood, or even the poison oak. Poison oak does add quite a bit to the enjoyment of the forests, if one doesn't have to, for one reason or another, get close to the Big Trees. And then there are the vistas out to other trees, from within one grove to another, and even reflections, too, in the small creeks.

Well, I think the lighting is what has impressed most people in the redwood forests. It's the flecks of sunlight starting with an opening far up in the canopy -- an opening that may be only as large as your fist -- and then protecting the light down through the forest until finally there is a sun spot with a diameter of up to three feet. It's almost like a pinhole camera opening projecting light into the forest and bringing the trees on stage, as if they were in a spotlight) and finally lighting up the whole cast. There were expressions of non-enjoyment of this too. Some people felt that it was extremely gloomy in these forests and oppressive. And the light likewise echoes and reverberates within the tree trunks, lighting them from one side to the other or lighting the tall shafts on hill slopes, or the trail too, and the different under-story species, the ferns and huckleberries, and the oxalis. The oxalis seems to follow the light around its leaves aim toward the opening from which the light is coming. And then as the light gets too bright they'll close up. The underside of the oxalis' leaves is purple. It's almost as though it were film having an anti-pelation backing. Perhaps it's better for trapping light. An occasional fallen leaf is hooked on a huckleberry shrub. And we see how some of our cathedrals resemble forests, especially when the large windows open up and we get back-lighting on our various trees in the under-story; and the tanoak looks like something different. And a young redwood tree may have lived there for a hundred years waiting for its chance in the sunlight when surrounding trees fall. Or a group of trees which came up around where one had been previously either burned off or possibly felled or shakes or ties, as in Muir Woods.

Now there are some interesting sidelights too to the Redwood Region and the coast redwoods. And one of these is Fern Canyon which has recently been added to Prairie Creek State Park. Fern Canyon has walls of five-finger ferns, 50 feet of wall covered with five-finger ferns, and then on top of that another 25 or 30 feet of Pleistocene fern. This is one place, though, where I advise you to wear wool clothing during most of the year.

Another aspect of the redwood which we sometimes find distressing is the intermittent occurrence of sediment. Just as we plan our weekend to go to the redwoods and sometimes find it's raining, we may find that the year we plan to go there was a sediment year and so we look in the forest and we see new soil everywhere, like snow. Now we'll look into the story which this yields to us as far as it concerns the historical record for these groves. And we see that these falls of sediment in effect have occurred at intervals in the past and they show their record in the life of these trees and in the groves which form on them. The grove on Wolf Creek Flat grows on sediment which has

been deposited from Bull Creek, where the forest is tall.

Now people who cut openings out of these forests find out to their chagrin that it's a dangerous place to live. Their homes get moved around. The river reaches heights towering above most of the buildings in town when it's full. But to the redwood trees, it's about like getting one's ankles wet. Water may come up to 20 feet on the tree and logs may pile in there, and barns also, and driftwood. But the trees have been used to this. As at Bull Creek Flat, it looked as if it had snowed. And we find up to two feet of sediment from a large storm such as occurred last winter. It is rather dangerous to walk around here the first month or so afterwards. In fact, there were three of us walking through here and one of us, Emanuel Fritz, happened to step into the wrong place and it took the two of us others to lift him out of there as he began to go down in and fall forward, and each of us sinking in finally up to our knees and deeper into what was a sinkhole where there was an old tree that had floated away.

But the interesting thing that occurs is that we begin to see lines of green occurring in each of the cracks. And if we look closely we see that the trees are beginning to seed in. Part of the life cycle of the redwood tree is coming into being at this point. The trees seed and germinate very well on these new sediments. Up to eight million seeds per acre fall on these areas, but normally, when there is not open ground or fresh sediment for them to fall on, they do not survive following this germination. And so we get waves of seedlings coming in which seem to date past sediment depositions. There is a wave of younger trees about six feet tall that date the sediment wave of 1938, and then a wave about 20 feet tall that seems to come from the 1916 flood, and then some about 25 feet tall which were the seedlings from the 1961 flood. They were only 25 feet tall in under the forest, but out on the open they were nearly 150 feet tall, forming a margin of young trees on the front of a grove. At Founders Grove a margin of young trees comes up the front of this region dating from the 1861 flood. There's also a margin of young trees which resulted from a timber harvest that occurred around South Fork station. Both events may bring on young tree growth, either the new sediment or soil that is there, or the timber harvest operation.

There's another story, too, because some trees 300 feet tall are growing in a sediment that is worthy of the height of those trees. The soil profile on which those trees are growing steps off into five-foot steps and onto the pith down to about 35 feet of depth. That grove is growing on Bull Creek Flat. Fifteen layers of past flood sediment were counted in one particular soil profile. This gave us a history of the past flooding and showed that our last flooding amounted to about 50 years accumulation of sediment, one column showing sediment deposition 1,200 years old. And it seemed that there may be a possibility of dating these sediment ages from a tree ring analysis on trees that have grown on those soils. For it seems that sometimes when new sediment is deposited there is an accentuation or acceleration of growth and the tree grows more rapidly -- then it slows down and later a new sediment deposit may come along to accelerate growth and the slowed-down growth. However, not every accelerated growth is due to the sediment. But this profile seemed to indicate that sediment periods occurred at 30- to 60- year intervals in these groves. So we seem to have a history of the age class chronology of the groves and possibly also in the tree ring analysis of these groves, of these past floods and sediment depositions.

So the trees are carrying their own history with them. It was interesting that the only place I got a similar feeling to this was at Olympia in Greece. There I noticed that the old sites of the Olympic Games and the village that existed there earlier had been buried by successive layers of sediment. I think there were about 30 feet of sediment that covered that site of the Olympic Games, and it looked much like the sediment that covered the feet of the groves in Bull Creek Flat. There we had

a record established by archeologists and by Greek historians. Here we have a record established by the trees and our interpretation of the knowledge they give us.

I think there is an aspect of the enjoyment of the redwood in the wood itself, and perhaps no better place to enjoy it than a sawmill such as Sturgeon's Mill which used to be near Santa Rosa. Now this fellow had a mill operating in a second-growth stand of redwood forest. He stacked his lumber out in the forest and one could go out in the cool shade and buy the type of lumber he liked. This man had planted a garden around his mill. He had an old steam whistle there. You could hear the sound of the mill, buy your lumber, and enjoy the fragrances of the sawn timber at that point. Now some people enjoy the sight of a large mill, for example, the Pacific Lumber Company. Probably there are as many visitors to this mill as to most state parks in a single year. And it is quite an event to watch these logs turning over, each one probably recording on a seismograph as it turns in the mill. They are gradually cut up for us to enjoy in our homes as furnishings and so forth. Now this harvest of timber results in many acres of second-growth forest, logged over areas as on the lands of the Pacific Lumber Company. And these perhaps don't offer the same qualities of enjoyment as the old-growth groves, but they offer many of the same types of enjoyment which forests throughout the world offer people.

But there is a shock. And some people have noticed for example the cuttings that are just outside the state park north of Orick -- these have become world famous because in the background we see the state park and then the harvested timber land. There is a rule of thumb that amenity foresters throughout the world have adopted, and that is that timber cuttings in recreational areas should be reasonable, gradual and natural. .However, even after an operation such as this, because the sites are so good, we find such rapid growth that there is not time to take the railroad tracks out as in the case of an operation in southern Humboldt County.

And we soon get a backdrop of second-growth forest giving us foliage that closes the slopes such as Ruskin would have liked to have seen, but, perhaps, not with the grandeur of the large trees. And we see, in such previously logged forests as the one on the north fork of the Mad River, streams for fishing, areas for hunting, but forests without quite the superlative nature of the old redwood groves, though still enjoyable ones. And occasionally it's necessary to have a marginal screen during the time that calamitous event takes place that most of us don't seem to like. The timber harvest operation takes place on the back country hills while we have a screen such as the Avenue of the Giants to shield this from the view. Within 10 or 20 years, of course, the second-growth forest grows up on the hills in the back, and is perhaps equal to a certain percentage of the majesty of the old forest.

Well now we can establish forests too -- even if we inherited a country that had no redwoods but 'had the seeds we could establish a forest such as the Italians did. There is a redwood forest in Italy with trees more than three feet in diameter, towering up more than 150 feet to form a superlative grove there. This is east of Florence about thirty miles. Well, just as with the Big Trees in the Sierra Nevadas we find that eventually these trees fall. When a giant tree falls following a large flood, the river will soon carve the roots out and make interesting shapes out of them.

Now, to review, we saw the effects of mist in the forest and perhaps some of the ideas these would bring us would be numberless, depending upon each of us. And in the Women's Clubs Grove there are a set of carved statements regarding the feelings that some people had about these trees -- in this case, among the oldest of living things, "What wisdom forests teach, stirring man's heart to thought deeper than speech." And each of us may make up a different statement. And in this case, one person thought, "For, lo, in the forest there comes contentment, peace and a sweet companionship of nature." Or another person, "Would that we were great as these and men were

brotherly as trees." Well, perhaps, these are statements that represented a certain time or feeling that a person had. But each of us have different feelings as we approach these trees, such as those at Redwood Mountain, the giant Sequoias of the Sierra and their silhouette, or those on the coast in a forest on the Van Duzen River with the young trees coming up on the slopes, or the poison oak, and sunset scenes along the coast at Freshwater Lagoon, or going up the south fork of the Eel River on a snowy evening with the redwoods to one's right.

I'd like to conclude with some statements about amenity forests, because of most of what I've been talking to you about this evening has involved the concept of amenity forests; forests that we enjoy just for the very things they bring u6 such as I've discussed, forests that people appreciate in a manner not essential to their physical existence, but merely because of the fact that they bring certain emotional responses or physical responses, not for wood, fuel, fencing and so forth. Actually some of the earliest amenity forests were set aside by the Romans. And near Spoleto there's a monument to a forest that was set aside for religious purposes when the Romans were pagans. This forest I think, was dedicated to Jupiter and one could only cut wood there one day a year on a day of celebration to Jupiter. Otherwise, one had a very severe fine to pay. And in medieval times there were religious forests set aside and in Vallombrosa and down in Sicily we see such forests.

More recently, amenity forests developed in Europe around the large land holdings of noblemen after the time when they felt they had to clear trees from around their houses for protection against invaders. Then, when they felt secure, they began to plant forests for the enjoyment of these forests, just for physical amenities such as the woodland amenities we get from the visual sense, hearing, sense of taste and touch, or from the ideal or emotional type of amenity, association with the forest for the ideas that it brings us, which we could have seen in some of these forests that we have considered tonight.

Now actually we find conflicts between these forms of amenities. And people are oftentimes in strong conflict even in this present day regarding what use to make of a forest and what amenity they would like to get out of it. I mentioned that transistorized radio which was being carried by a person who was enjoying the forest just for the walk that day, but with a transistor radio. And actually one of our most severe conflicts comes from this conflict of the physical use of the forest and the amenity use of the forest. What we find is that there are certain rules of thumb that have developed where populations have increased to the point where people have learned to live with each other. In such commercial forest operations as have occurred, they have dealt that any large forestry operations such as plantations or harvests which are obviously artificial in outline would not be allowed, or rather should not be conducted, just for the amenity values that were being destroyed.

Now the introduction of radical change in forested landscapes with- out adequate information about the change to take place has been a severe ill in some areas. And most people accept change in their forest landscape -- even in a well-loved landscape -- if adequate notice and reasons have been given for making this change. In essence, those rules of thumb that I mentioned to you of reasonableness, gradualness and naturalness are good ones for the forester to apply where he has forests that have amenity values as well as commercial values.

People have argued about economic values of forests. And those who manage amenity forests have pointed out that an amenity forest has values all of the time, every time a person looks at it or enjoys it there is some value there, but that commercial forests generally have their main value at one time, the time when the tree is cut. It may be possible though to combine these values, to have amenity values from forests in the second stage of growth following timber harvest and then from the

physical value some time later with harvest, but shifting our amenity values across the landscape. Some way or other these types of details will have to be worked out by foresters in the future; particularly as our population increases in California and in other parts of the United States.