

# The TIMBERMAN

DEVOTED TO THE LUMBER INTERESTS OF THE PACIFIC COAST

Exponent of the Woodworking Industry of the West. Official Journal Western Planing Mill and Woodworking Association, Including Colorado, Wyoming, New Mexico, Arizona, California, Nevada, Utah, Montana, Idaho, Oregon, Washington, British Columbia.

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## FOURTEENTH PACIFIC LOGGING CONGRESS

THE fourteenth session of the Pacific Logging Congress made history. The attendance was representative. The city of Spokane, which is the center of the Inland Empire lumber activities, was a gracious host. The setting for the Congress, in the beautiful Hotel Davenport, lent a charm and personality which was reflected throughout the three busy days of the big show. The sessions were well attended and the discussions often animated. There was not a dull moment on the crowded program.

The Welfare Dinner, held under the auspices of the industrial department of the Y. M. C. A., was as usual, a very valuable feature of the Congress. The address by Mr. Kenneth Ross, manager of the lumber department of the Anaconda Copper Mining Company, Bonner, Mont., on the influence of the library in the logging camp, was a most forceful presentation of the value of wholesome literature. Mr. Ross' address made a deep impression. His suggestion should be followed and every logging camp should be supplied with good books. It is an investment which pays from every standpoint. "As a man thinketh so is he," and the books he reads have much to do with moulding his attitude towards life.

Norman F. Coleman, president of the Four-L's, made his usual stirring appeal, emphasizing the need for continually striving for the betterment of camp life; the creation of social centers in the camp and the important place which family life bears to civilization. The other addresses were along the same line and well received. There is no single feature of the Congress more familiar while than the Welfare Dinner. The familiar faces of A. W. Laird, J. J. Donovan, J. C. Dolan, Jim O'Hearne, George Johnson, Alex Polson and others, were missed at the dinner, but there were good reasons in every instance for their absence.

IN accordance with the usual custom of the Congress of "three days in the house and one day in the woods," a very delightful trip was taken to the camp of the Deer Park Lumber Company, Deer Park, Washington, where a modern western white pine operation was witnessed. A Great Northern special was chartered for the trip, and about one hundred happy delegates, accompanied by wives and sweethearts, boarded the train for Springdale, a distance of forty-seven miles, where a transfer was made to the Logging Congress special of the Deer Park Lumber Company for a twenty-mile trip in open flat cars to the camp. The atmosphere, with just a tang of autumn in its breath; the glorious sunshine and the ever-changing scenes of farm, upland and timber land, afforded a panorama of surpassing charm. Arriving at the well-equipped camp, a very delightful luncheon was served and the various operations of the camp witnessed. The outing was one of the most interesting of the thirteen similar trips previously enjoyed.

"Bob" Jensen, the official announcer, was as usual, one of the happy features of the Congress and contributed much, as he always does, with his familiar running mate, "Toots-E," in making the Congress a success.

The annual banquet, staged with all the splendence of a modern vaudeville performance, interspersed with brief and happy addresses, closing with a moving picture showing the log drive in the boom, was a fitting climax to a full three-day study course. "Uncle Ed" English,

the venerable dean of the Logging Congress, was the recipient of many kindly greetings. Mr. Huntington Taylor was commandeered as official toastmaster, presiding most happily at the Welfare and Congress dinners.

Among the many outstanding features was the address of Dean Hugo Winkenwerder, of the University of Washington, who presented most forcefully, in behalf of the forestry schools, the close relationship which exists between the higher educational institutions of Idaho, Oregon, Montana, California, Washington and British Columbia and the logging industry. The creation of the profession of the logging engineer was a joint achievement of the Congress and the schools of forestry. The Congress had indelibly left its impress on the educational institutions of the West. Chairs in logging engineering should be endowed as a fitting recognition of the very important part the forestry and logging engineering schools play in the industry.

THE Congress expanded its territorial jurisdiction and annexed New Mexico, with Colonel Geo. E. Breece, of Albuquerque, as director. Colonel Breece is well and favorably known in connection with his work in the Spruce Division. The original zone of activities included British Columbia, Washington, Oregon, Idaho and California, and later Montana and Arizona were added. New Mexico is the latest addition to its galaxy of stars.

Each year the Congress chronicles some new achievement in the logging industry, foremost of which this year was the invention of the Luetgert Diesel type logging engine, now being demonstrated at the camp of the Bloedel Donovan Lumber Mills, Bellingham, Washington, and was the result of a suggestion made by Mr. J. J. Donovan at the Tacoma Congress last year.

A more extended use of electric logging in California and Washington and the development of some new mechanical features were disclosed.

The power-driven big wheel shows undoubted possibilities in the pine field. A tractor equipped with drums and a yarding and loading boom; a power lift for big wheels propelled by a tractor, and a new design of a power-operated saw for felling and bucking, constitute the more distinct and important advancements in logging equipment.

While the program was designed with the view of fitting more particularly Inland Empire logging conditions, the discussions soon developed that the loggers from other districts could learn a very great deal from the Inland Empire logger, more especially in the use of long supported cableways. One of the most interesting discussions was the subject of horse logging versus other methods. Mr. E. C. McGregor, of Boise Payette Lumber Company, Boise, Idaho, certainly justified his faith in "Old Dobbin" as he enthusiastically repelled the barrage of steam, electric and gasoline equipment arguments which were hurled against him. "Old Dobbin" is still on the job.

As noticeable at former Congresses there is a very growing tendency towards the elimination of the traditional paper and a greater desire for extemporaneous addresses. The average logger, who only a few years ago was a little backward and "stage shy," is now able to get on his feet and present his ideas very clearly. The Congress has been a sort of an oratorical school for the boys, and in the future the bulk of the subjects

will be open discussion with a running debate. This plan brings out the meat of the argument. The moving picture has, of course, been responsible to a very great extent for the easier presentation of nearly every topic discussed. The range and character of the moving pictures and stereopticons shown at the fourteenth session afforded a liberal education in modern logging methods. Two of the very notable pictures were logging scenes in Maine, while the "Afternoon in the Redwoods," depicting the operations of the Hammond Lumber Company, Samoa; The Pacific Lumber Co., Scotia, and the Union Lumber Company, Fort Bragg, California, were of especial interest. The tractor and truck logging scenes, both in pine and Douglas fir, disclosed the development of these two systems of logging, in which the Congress has played its part in incorporating them in the industry.

**T**HE deep interest taken in the subject of reforestation was inspiring. The logger has come to realize that without trees his business is gone, and like the Arab of old, he can only fold his tent and "hit" Siberia or some other land where trees still exist. The discussion aroused a profound interest in a question which affects the nation most vitally. Already in the California redwoods production on a sustained yield basis is being practiced by private owners, and the same situation holds good in National Forest pine operations, and some Douglas fir operators are seriously considering the adoption of a reforestation system which will insure a constant supply of timber. The general consensus was that the state or federal governments must be the principal factors in reforestation.

The "safety first" movement in the camps came in for its proper and very important place on the program. This is a subject of deep concern, as the loss of life and limb in the logging industry is appallingly heavy. The only sure preventative is the education of the men in safety measures, which must be backed up by the management. The manhood of the logging industry must be safeguarded at any cost. Life is priceless.

During the regular sessions of the Congress several group sessions were held, including a conference of the deans of the schools of forestry and logging engineering, as well as those in charge of the work of forest protection. Each year as the work of the Congress broadens the value of the group session will become more appreciated.

**T**HE interesting discussion on the subject of Fire Prevention, led by Captain C. S. Cowan, of the British Columbia Forest Service, supplemented by other speakers, emphasized the value and real need of the camp fire warden in the logging camp. These discussions were illuminated by the film, "The Red Enemy," and pictures of fire-fighting apparatus. A demonstration of the value of the portable fire pump was given at Spokane and also at Deer Park.

The Congress very wisely decided to take up the suggestion of employing a paid secretary who could devote his entire time to the Congress. The position is worthy of the best talent that can be secured. Preferably it should be a young man with logging engineering training, who has a sympathy with the purposes of the Congress—which must exemplify the spirit of the men who actually perform the work in the woods. They must be made to feel they have a real part in it—this is the tradition of the Congress and its democracy of spirit in the past is what has made it not only a forum for mechanical but human expression.

#### COMBAT MILLWORK RATE ADVANCES.

**T**HE Interstate Commerce Commission has declined to suspend advances on certain millwork, originating in Alberta, British Columbia, Washington, Oregon, Idaho, Montana and California, to territory east of Pittsburgh, Pa., and Buffalo, N. Y. G. B. McGinty, secretary of the commission, in writing to The Timberman, said: "The commission by this action does not approve any of the schedules contained in this protested tariff, all such schedules being subject to formal complaint, investigation and correction." Formal complaint has been filed with the commission.

Additional supplements to tariffs have been issued, which limit the application of the advances to Atlantic Coast points. The advances, in some cases aggregating 25 per cent, apply on stock "further advanced in manufacture than by sawing, resawing and passing lengthwise through

a standard planing machine, crosscut to length and end matched." Sample articles taking the higher rate are turned columns, base blocks, and spindles; seemingly it would be reasonable to anticipate that if these advances become effective corresponding restrictions and advances may follow on many other articles such as crossarms, ironing board parts, handles, pipe material, silo staves, roller stock, tank material and tubing.

If a small amount of an article taking the higher rate is shipped in a car of lumber, the highest freight rate will apply to the entire carload. Some mills ship a small amount of turned columns or turned porch work in cars with lumber. An increase of 15 cents or 20 cents per hundred pounds in the freight on such shipments would be serious. Thus it is clear that the advances touch not only the millwork manufacturers, but the ordinary lumber manufacturers.

At first the western railroads disclaimed any interest in the advances. Inquiry for the reason of the advances to eastern lines brought the reply that the western lines made the advances and the eastern lines merely concurred with the western lines, which would seem rather peculiar. However, this development serves to emphasize the wisdom of grouping the railroads of the United States into homogeneous coast-to-coast systems, thereby securing uniformity in rate structure which would ensure a regard for the welfare of business enterprises irrespective of location on the systems.

Approximately 3000 straight carloads of the articles taking the advances are now shipped annually. The millwork business of the West has been steadily built up in the face of great difficulty. It utilizes, to a considerable extent, low-grade material, which in order to be marketed must be fashioned into necessary units of construction at point of cheapest production. The carriers should not be permitted to destroy the rational relationship in rates which has permitted the millwork industry on the Coast to be built up through a logical evolution in the elimination of waste through refinement.

Lumber manufacturers and millwork producers should resist most vigorously any increased restrictions in mixtures or advances in rates by restriction in classification of forest products. Lumber manufacturers, therefore, should support the millwork producers in this case in a most vigorous manner. No stone should be left unturned to restore the former rates and mixing privileges.

#### REPARATION IN SOUTHWEST CASE.

**T**HE Lumbermen's Association of Texas has served notice, through its traffic department, on the Interstate Commerce Commission, the railroads and shippers, that it proposes to attempt to recover reparations, based on the difference between the old and present rates of freight, effective October 5, on lumber and shingles. The former rates were held unreasonable on lumber products originating in Oregon, Washington, California, Idaho, Montana and British Columbia for delivery in Texas and the Southwest. The amount sought to be recovered aggregates many thousands of dollars. The subject of reparation involves both legal and correct business ethics. In this case the buyers of lumber products purchased the goods on an agreed delivered basis. The freight rate was a known factor. The question of the reasonableness of the rate may or may not have been in the minds of the buyers when the orders were placed: at least it may fairly be assumed that the likelihood of a later refund was not a controlling factor in placing the orders. The rate was presumed to be reasonable and lawful until held otherwise. After investigation the Interstate Commerce Commission held that the rate was unreasonable and established a lower basis and awarded reparations.

The railroads placed in effect the rates fixed by the commission, but demurred at the payment of reparations on the theory that the manufacturer sold the forest products to the buyer at the full f. o. b. mill price, plus the full freight rate, and that the buyer sold to the ultimate consumer, collected his profit, based on his costs, and thus closed the transaction. If the theory of the carriers is correct in this case it would appear, strictly from an ethical standpoint, that the ultimate consumer is entitled to any refund, as the price he paid was undoubtedly predicated on the cost to the dealer.

The position of the carriers in this case may be somewhat analogous to the retail dealer who buys a stock of lumber on a high basis and resells

a portion at a fair profit. A sudden drop occurs in the price and subsequent orders are filled, in many cases, from the same stock, at lower prices. It would generally be held unreasonable to entertain an application for a refund on the previous purchases, because the transactions represented current fair values at the time the transactions took place. To hold otherwise would undermine and unsettle the foundations of business, which rests upon the principle that the time, circumstances and conditions surrounding a transaction become a part of the transaction and was acquiesced in by the buyer. Unless it can be shown deception was practiced the transaction is lawfully closed.

Under the law the members of the Lumbermen's Association of Texas are not entitled to any reparation unless they joined as complainants in the complaint on which reparations were awarded. The record in this case does not show that they joined. Furthermore, the Interstate Commerce Commission, in previous cases, has held that its functions are purely regulatory and it is not charged with the duty of collecting overcharges, which is a function of the courts, and it will probably take a considerable time to adjudicate the contention, in this case, on its merits.

#### INLAND EMPIRE EXPORT RATES.

**I**NVESTIGATION has convinced leading Inland Empire lumber manufacturers that a part of the cut which cannot be readily marketed in this country can be exported, provided reasonable export rates can be secured from Inland Empire points to Pacific Coast ports on Idaho white and western white pine. The Timberman has urged the railroads to grant low export rates, believing it to be for the best interests of both carrier and shipper. The sales manager of a large Idaho white pine mill comments thus to The Timberman upon the subject:

"While in Boston recently I investigated export possibilities, as we had a few cars that were going to Boston for export to the West Indies. It was impossible, under the present high rates, to ship this stock to the Pacific seaboard and handle by water. If we had reasonable export rates to the Pacific Coast we could have shipped between 25 and 30 cars, whereas, being forced to ship to the Atlantic Coast, we were able to ship only three cars."

An official of an Eastern Washington company, manufacturing western white pine, writes The Timberman: "We have never shipped any lumber to the West Coast for export, although we have quoted on numerous inquiries and feel that we would have received at least a portion of this business had we had a reasonable freight rate to the Coast. We are daily receiving requests for quotations aboard steamer, but it is useless for us to quote on this business on account of the high freight rate."

A very limited export business is being done at present by Inland Empire mills, which gives evidence of possible development, as indicated by a letter to The Timberman from an officer of a large manufacturer of Idaho and western white pine, who said:

"In 1923 we have exported upwards of a million feet, the stock going to South America through the Port of Portland. We are figuring now on several million and have in sight two to two and a half million, practically all for Japan. With an export rate I am certain we could ship one to two million feet a month. We have to refrain from quoting on a lot of stock, because we cannot meet conditions unless we can obtain an export rate of about 15 cents per hundred pounds."

The prosperity of the western railroads is linked very closely to the ability of the sawmills to manufacture and sell their lumber at a profit. If the mills can only ship a part of their cutting capacity, the freight revenue of the carriers is curtailed. It is now regarded by leading railroad executives as good business to permit a portion of the traffic originating on their lines to be diverted to water transportation, if by so doing a larger total volume of traffic may result. This is exactly the position the carriers are taking with mills located west of the Cascades. During one month one western line handled over 1000 cars of lumber, cut by interior mills on its lines and exported through Coast ports. This particular line handles a very large part of the rail lumber movement eastward.

Again, there comes a time in the history of all lumber-producing sections when there is a slackening of the demand for a particular species of

be managed with profit to their owner. The present generation is not the sole owner of this forest property. Public ownership of such resources must govern its present use in a manner to provide for future crops and in contemplation of the future interests of posterity.

The word posterity always has an unpleasant sound to selfish people. Selfish people always want to appropriate all the good things to themselves, and this is especially true with respect to natural resources, where very little effort has been required of us to produce them. The future boys and girls of our common schools will no doubt find their material need for wood and forest just as pertinent to their every day life as percentage and interest. As state forester, therefore, I feel under obligations to future, as well as to the present owner of these forest properties. I feel that my children and your children ought to expect the conservation and proper management of these state forests. Their children in turn will be dependent very largely upon how wisely you and I act in the management of their heritage. The state can and should manage its forests in consideration of the needs of its future citizens. It is for this reason that our management of the state forests has been on the basis of crop production. We may harvest present crops, but we must leave the forest in condition to grow another crop.

### Assuring a Future Crop

IN Montana's state forests, as in most all forests of the West, we deal with virgin timber. Great families of trees have grown up together, having distinction in time of origin and in characteristics, forming classes as to age and species. Careful analysis of our forests as to these features has been recently inaugurated and given due importance in the management and cutting plans of our state forests.

In these plans of management, it has been one of the purposes of the Montana state forestry department to determine the essentials necessary to keep our forests producing, and then to approach the practices to be required in a conservative and practical manner.

During my first summer in this new work, I spent most of my time in the field trying to become familiar with our state forests and the activities connected with them. I was greatly surprised to find such extensive devastations.

In Bear Creek, near Bozeman, the state owns, in round numbers, about 3000 acres of what was at one time a splendid forest of lodgepole pine, Douglas (red fir) and Englemann spruce, but which is today almost a barren waste, struggling meagerly to reproduce to lodgepole pine. It will take all of, or more than, 150 years to secure the re-establishment of this one-time forest.

In the vicinity of Whitefish I saw a cutting area on state land where select young trees had been felled and one or two logs cut from the center of the tree, while the butt log and top logs were left in the woods. Criminal waste!

I saw the shores of the lower Stillwater denuded to such extent that it will require a quarter of a century at least before the forest can recover—the beautiful lake shore destroyed and gone never to be re-established in any degree approaching its former beauty in this or the next generation.

And so on through other ruined state forests, and I said: "This is not what Montana wants. This is not what her people have bargained for. This is not forestry. This is not conservation." And why? Looking about for causes and remedies, I found our state laws were defective and antiquated.

### Old Law Obsolete

I FOUND a practice had grown up from an old law copied from statutes that permitted the exploitation of Wisconsin and Minnesota forests, and that had long since been repealed by those states. That law and the practice thereunder had established eight inches in diameter 20 feet from the ground as the fixed diameter limit to which green timber could be cut. Such a regulation is defective and antiquated. The limit is too small. It permits the cutting of too much timber that should be left. Moreover, the law is impossible of accurate application, except by some superman like Paul Bunyon, for most Montana men are under six feet in height.

Wherever timber was cut under this requirement it was found that the brush and debris resulted from the effort to use such small timber were unnecessarily excessive.

After these overcuttings had taken place, after the excessive accumulation of brush and debris had been made, the last touch to make complete the desolation and ruin of our state forests was fire, and that followed sooner or later.

To stop this waste and desolation of our forests, it was necessary to put into effect almost a reverse policy. When the trouble was discerned and a new policy devised I went directly to the individual lumbermen of Montana, frankly gave them a picture of the condition of our Montana forests, and asked them to support a new policy—a policy which I feel is consistent with present lumbering methods and compatible with desirable forestry practice. Some of these men had contracts unexpired which might have

afforded them good excuse to refuse my plans. But did they refuse? Not one of them. And I want to take this occasion to make it known that Montana's lumbermen, purely from an unselfish interest in their state, and the conservation of its resources, acceded to those plans to the last man.

Today on all Montana state forests we are leaving the young timber uncut, and we are conserving it for the future crops of 30 or 40 years hence. We believe by so doing that the yield of timber in that day will furnish greater revenue to the school funds than the prospective interest before mentioned. We believe, too, that this is the surest and cheapest method of keeping our forest lands producing, which is in distinct contrast to the waste and idle forest lands that constitute such a liability in many older states. Keeping these forest lands productive and producing is an asset to labor, to business, to recreation and the enjoyment of our fuller lives.

### The Slash Is Burned

A MONTANA statute requires that all slash resulting from cutting timber, regardless of who the owner may be, shall be burned or otherwise disposed of within a year of the time the slash was created. This law did not automatically enforce itself, even though penalties were attached for non-compliance. In consequence, the state forestry department inherited fully 25,000 acres of slashings that had been accumulating for several years previous. To date, this department has secured the disposition of the slash and debris on over 20,000 acres of land. This slash formerly constituted a menace to adjoining timber.

The brush disposal law does not exempt the state as an owner of forest land from its operation.

In fact, if the state is to preserve from destruction the young timber left uncut on its timber sale areas, it is likewise essential for the state to dispose of its brush. There has been no difficulty in securing this action from purchasers of state timber, where species of timber involved was of high value. The requirement in the contract that the brush had to be piled and burned was sufficient, with proper supervision on the part of the state forest officers.

In the case of operations in larch-fir type, our brush disposal has been a problem. A Montana statute provides a \$3 minimum stumpage for all green timber. Beginning with a \$3 stumpage rate, it has been found practically impossible to sell our larch and fir, if we added on any expensive brush disposal requirements. Only by the closest kind of co-operation and recognition of the lumbermen's difficulties in this type of timber have we been able to make sales and secure results in brush disposal. Together we have experimented in both piling and burning. We tried spring burning and fall burning, and have had both good and bad results.

In the larch-fir type, and under the present minimum stumpage price, I have had to concede, with reluctance, that the most to be expected, as a general rule, in brush piling is what may be secured by swampers piling at the time of cutting. Further handling of the brush is practically out of the question.

Keeping in mind that the slash is a menace, especially to young stands of timber, and that this slash must be largely eliminated in the most economical manner, we are tackling the job this fall and winter from a different angle.

The state has purchased a dozen Hauck brush burning torches. Under very adverse weather conditions we have already demonstrated the feasibility of their use in burning brush and preserving the young timber at a very reasonable cost.

We shall keep definite records of cost and results obtained, so that next spring we shall be under way to better slash-disposal methods, and surer results, as to the preservation of our young stands of timber, than are anticipated.

### Summary

THE efforts of the lumbermen and the state forestry department to solve their mutual problem have resulted in the practical acceptance of the following principles of forest management:

#### Pine.

1. No live timber under 14 inches in diameter, breast high, may be cut. (Diameter limit may be raised or lowered if conditions warrant, as shown by analysis.)

2. Brush shall be piled and burned by purchaser under supervision of state forest officer. (Or option of depositing to brush-disposal fund an estimated price is open; upon acceptance of purchaser, the state takes care of the brush.)

3. Appraisal takes into account cost of brush disposal as a factor in the operations, which the purchaser must pay for.

#### Larch and Fir.

1. No live timber under 13 inches in diameter, breast high, shall be cut. Lower or higher diameter limit may be fixed if analysis of timber warrants.

2. Swampers' piles will be generally accepted by state as sufficient for burning purposes.

3. Purchaser burns brush in swampers' piles currently with cutting. The state furnishes man for group of sales to secure as good piles as possible, and to instruct in use of Hauck torch, which is also furnished by the state.

4. A genuine and bona fide effort on the part of the purchaser to secure brush disposal on this plan relieves him from further liability.

### Reforestation in the Redwoods

President Murray: Mr. Stevens, of Mason & Stevens, will tell us something of the reforestation work of The Pacific Lumber Co. in Humboldt County, California.

Carl M. Stevens: A good deal of this talk that goes on now about reforestation and forest management seems very complicated at times, and you are apt to be confused, and sometimes the problem looks hard and severe. This business of the production of wood fiber for commercial usage is a business just like any other; it will be controlled as business is now controlled, by economic laws. The market price received for the product will be all controlling. There is no way to artificially stimulate that. It may be worked out and picked out, built up here and built up there, but in the long run the thing that is going to count more than anything else is what you get for the product that you grow. When the price to be received for the product gets to a point which justifies timber growing, timber will be grown.

We have been in this business of timber growing for a long time. It is undoubtedly true that we haven't carried the business on scientifically, but timber has been growing. A good many of the things which are talked of as being prohibitive, such as taxation being confiscatory, will not in themselves determine whether timber is to be grown. Taxation or any other cost will, in the last analysis, being a cost intermediary to the production of the product, resolves itself in the long run to land value just exactly like any other crop. If taxation is high, poorer lands can't be used to grow timber; better class lands will be worth less than though taxation were lower, but timber will be grown, because the lands will be left alone, and if they are left alone timber will grow.

(Stereopticon views were thrown on the screen, showing reforestation in redwood.)

### How Redwood Reproduces

Mr. Stevens: That picture shows the method of sprouting in redwood. Around each tree—not every tree, but around approximately 80 per cent of the trees which stand on an area that is cut over, almost without regard to how hard the area is burned—and all of the redwood area is burned very hard—the trees sprout very prolifically. As a matter of practical forest management, however, the percentage of the area covered by those redwood sprouts is very small, and we now plan to plant in the redwood region approximately 80 per cent of the area.

Some experimental thinning in second-growth stands has been done. These second-growth stands were started under the old method of logging. When they were in the redwoods with bull teams, the same as you were here a good many years ago, they left a good deal of stuff on the ground and always left an opportunity for enough seed to fall to reproduce the area. This area was then reproduced much more heavily than an area now logged would be. They went in and cut this out, made a regular silvicultural thinning in that second-growth stand, simply in order to determine what could be done. The thinning was very successful. They got very good lumber.

Secretary Cornwall: You might speak a word on the making, Mr. Stevens.

Mr. Stevens: That is simply to use a great deal of the material that is left on the ground. In the redwood, which is a species that has great durability, a good deal of the old stuff left on the ground after the usual logging operation is carried on can be used at a later date. Thus, ties are made from some of the refuse.

Secretary Cornwall: I might say that Mr. Corbitt, who is the forester for The Pacific Lumber Co., who says in a recent paper:

"A study of the results will prove enlightening to those interested in reforestation, for the figures show what can be expected from trees that are 50 years and older. The redwood trees of that age averaged better than 500 board feet per tree, mill tally. The mill tally gave 21.7 per cent higher results than the Spaulding scale and 5.8 per cent lower than the International rule. The average annual growth amounted to 9.6 board feet per tree. Other species cut from the same forest show the annual growth to be as follows:

Sitka spruce 26 B. M., Douglas fir 15.4 B. M., white fir 18.3 B. M. The redwood showed 11.6 per cent clear lumber, whereas the other species did not make 2 per cent."

Mr. Stevens: Sixty per cent of the redwood cut has now definitely adopted a permanent policy of redwood management, and 30 per cent is

(Continued on page 90)

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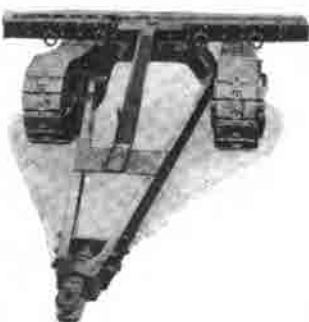
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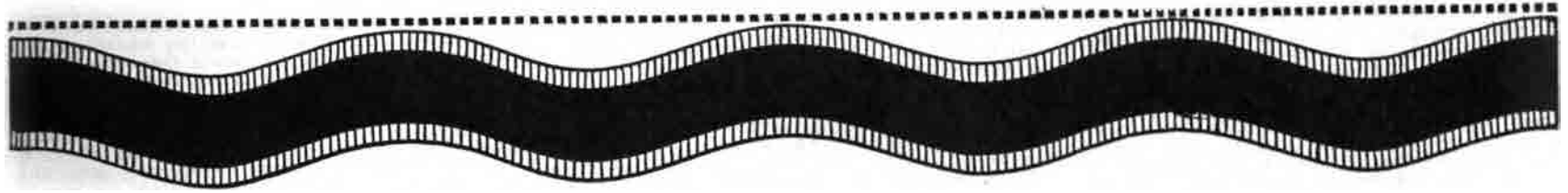
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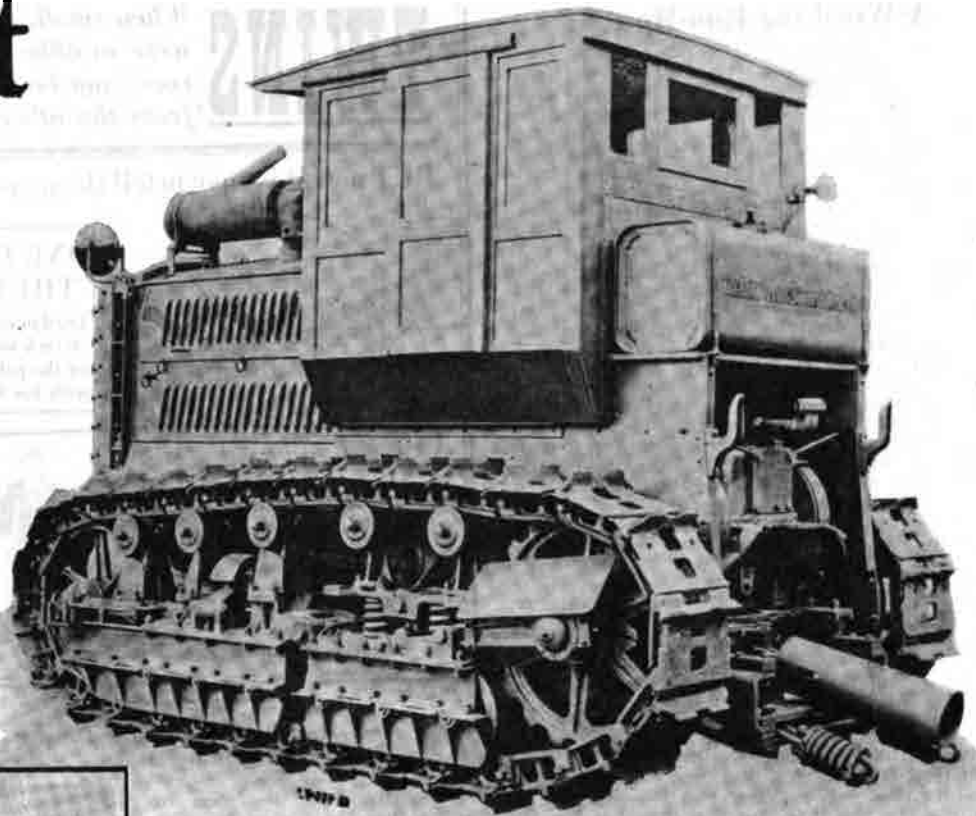
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(Continued from page 86)

studying the problem to see what can be done. The two counties of Humboldt and Mendocino, which have most of the redwood in them, have consolidated their nursery operations. The Pacific Lumber Co. runs the nursery for Humboldt County, the other operators in that region who are engaged in that same kind of work placing orders with the Pacific. The Union Lumber Co., in Mendocino County, at Fort Bragg, runs the nursery for Mendocino County. It is a matter of convenience in growing the stock.

### A Word for Hoo-Hoo

Parson Peter SImpkin: I am here representing the other half of your business. The great trouble with the logger of yesterday, and some of those of today, is that he forgot that all of the logging interest is not just right where he is working in the forests. You men with the keener intelligence and with the new conditions that are facing you are being made from day to day to realize that there are things outside of your own forces and your own organization that are vital to you; and I want you men to know that in this time when this country is thinking about reforestation that you have 25,000 or 30,000 fellows scattered over this country who are your friends, who are anxious to crystallize opinion in the United States where they are doing business, so that you shall have just as fair a deal everywhere in the West as men can expect, as you face the problems that you will have to face in the years that lie before you.

I am here to remind you men who are in this Congress that you have a great human element outside of the forest that is tied to you. Hoo-Hoo is carrying on today a program of education along this line of reforestation; it is trying to get the minds of the people of the United States to look at your game as you want it looked at; and you ought to remember at the same time it is trying to teach the men so to merchandise the product of the forest that that which you have thrown away in the past will not be thrown away. We are teaching the men the necessity for using the poorer part of your product, so that some of the burdens you have carried in the days gone by you shall not have to carry tomorrow.

I want you to feel as I appeal to you men to join Hoo-Hoo that it is a legitimate part of the logging business. We want to tie our entire lumber industry together, from the logger to the export office, in one body, and put over this game of lumber. The old days of just conviviality in Hoo-Hoo have gone by. We have today a great business organization working for you and every element in lumber.

### FRIDAY MORNING.

President Murray: The first subject on the program this morning is that of accident-prevention education. R. P. Duncan, chief assistant supervisor of the safety division of the department of labor and industries, Olympia, Wash., is going to give us something on accident prevention.

### Accident Prevention

R. P. Duncan: I am sure that the subject of accidents and accident prevention will interest no group of men any more than it does you. I have been through the sessions and have listened with interest to the subjects that have come before your conference, but I am sure that the subject of accident prevention and the conserving of man power is not the least.

Last year, for the year ending June 30, 1923, there were 31,000 industrial accidents reported to our division. There were 408 fatal accidents. We had 40 permanently totally disabled men—disabled either by the loss of eyesight, the loss of limbs, or hands. We had 2239 permanently partially crippled men in 12 months—men who lost a leg or an arm or a hand, a foot, fingers or toes.

In the woods alone we had 229 fatal accidents in 12 months and 596 permanently disabled men. The cost to the logging industry in industrial insurance was only \$834,559, not counting the cost of medical aid, for which the state paid something over \$104,000. And that was the small end of it, because most of the logging concerns are under contract, and I am sure that a conservative estimate would be, for the medical aid and hospital care of injured workmen from the woods, close to half a million dollars for one year. In addition to that, your industry lost 147,538 man days, a cost that cannot be estimated really, because replacing a man on the job is always costly.

Some people claim it costs them \$200 to replace a man, and I am sure it does with some of your men. The smallest cost that I hear is \$10 in replacing the man in the turnover.

Now, what are we going to do about it? In many industries we can do much more than we can in the woods. We can go into many industries, where the hazards are not nearly as great, and do a great many things that will help to reduce accidents, such as the physical safe-

guarding of plants and appliances. But in the woods we cannot do much of that. You fellows are bucking the sidehills where it is almost impossible to safeguard the men. Nobody knows what it costs to get out logs. It is good gear, good tackle, and good men. There is very little we can do from a mechanical safeguarding standpoint in the woods. The greatest safeguard in the world is the thoughtful, careful workman. By co-operation, by co-operating with the department, co-operation on the part of the men,

and the men came out on the flatcar ready to go to work. Mr. Duncan took the middle of the platform and he talked straight from the shoulder, and I was particularly interested to notice that there was very rapt attention on the part of all the men, and his doctrine sank home, I am quite sure. It seems to me if we could have more of that sort of educational work, if we could keep constantly before the men the necessity for their own co-operation, we would have won a very large majority of the battle.

### Difficult to Get New Ideas

Floyd Daggett: At present I am employed by the lumber interests of the Inland Empire, and have been for a number of years, caring for safety work in their interests. You can start safety campaigns, but the next thing is to keep them going. We who are working in the line find that our chief trouble is to get new ideas and good ways of presentation to keep up the interest.

Safety, in a spasmodic way, is getting nowhere. It has got to go to your men and to your employes; from the boss clear down to the man performing the lowest type of labor in your operation.

Do you know that in 1921 there were 12,800,000 accidents, to say nothing of those not reported throughout the United States. The population, according to the last census, was around about 105,000,000, which makes about one out of every eight persons in the United States injured at some time during the year. Thirty-two per cent of these 12,800,000 people injured were injured in industrial plants, and 62 per cent, or nearly two-thirds of those were what we call public accidents, in the line of travel on railroads and highways. Six per cent of the accidents occurred around the home.

I handle mills and operations of the Timber Products Manufacturers' Association for Eastern Washington and Northern Idaho. I started in a little over a year ago going into these towns and talking to school children. For two reasons: In the first place, if you can get those little fellows inoculated with the safety idea they are going to grow up safe and sane citizens. The next is, they carry it home. My personal observation has been, folks, that the little fellow coming home and telling the story that he heard somebody tell him at school is going to hit that man that works in your mills about as forcibly as some man standing up and talking to him in a meeting where they are all men, and some fellow sitting by him telling him it is bunk.

### Falling and Bucking Heads List

Chairman Vinnedge: Mr. Daggett, some years ago I looked into the question of the preponderance of accidents in the different departments of the lumber industry, and my memory is that about 60 per cent at that time was in the falling and bucking end. Has that changed or is that percentage about right?

Mr. Daggett: I would like to have Captain Harris, the statistician of the state department, answer that.

C. B. Harris: In the various hazardous occupations, fatal accidents are running about even with the buckers and the fallers and the loaders. Those men are being killed in about the same proportion. They are furnishing more fatal accidents than any other class of men.

At this point stereopticon slides of the new Leutgert Diesel drive donkey engine, which is being tested out at the camp of the Bloedel Donovan Lumber Mills, Bellingham, Wash., were shown. Mr. Berger assisted in the explanation of a number of questions that were asked by the delegates.

### Rutledge Skyline Again Discussed

Following the Diesel yarder slides, views of the overhead system of The Edward Rutledge Timber Co., of Coeur d'Alene, Idaho, were presented. E. J. Gaffney illustrated the installation by a drawing, similar to the one reproduced herewith. Discussion on this subject ensued, which is subjoined:

Mr. Gaffney: That is the trolley. The donkey sets over here. This is an oscillating trolley. It is not a stiff trolley like the old ones we first used. It rolls on a support and is oscillates as it goes over the supports on the line. The old stiff trolley sometimes would come over this support, and it would come over a rough support and would not hit the line; as this forward sheave would come over it didn't always strike on the line. With this trolley it is on the line all the time; it is flexible.

President Murray: Is that timber skidded to your skyline with horses?

Mr. Gaffney: In some cases, but very often we change the line. It does its own yarding.

President Murray: How far off either side of your skyline.

Mr. Gaffney: About 150 feet.

President Murray: How close to the ground is your carriage when you are going over the hump there?

Mr. Gaffney: It depends on the height of your support, but we usually put up a 45 to 50,



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co-operation on the part of the management, giving thought to this thing, shall we cut down accidents.

E. C. English: I would like to ask Mr. Duncan if he finds where they are changing men a great deal that there are more accidents?

Mr. Duncan: Yes. You deal with green men, who are not accustomed to your system.

Mr. English: My experience is where you have crews working for you for years you haven't as many accidents. The great trouble



A Plea for the Use of Safeguards

we find is with green men. They claim to be hooktenders, or buckers, which they never were before in their lives.

R. W. Vinnedge: I had heard of Mr. Duncan's activities and I wrote his department asking if Mr. Duncan might not come up to our operation and talk to the men. He did; and you can realize he would make a very forceful presentation to the men. He talks their language. We blew the whistle 15 minutes early,

# REFORESTATION IN THE REDWOODS

By Willis G. Corbitt

Forest Engineer, The Pacific Lumber Co., Scotia, Cal.

**M**UCH has been said and written about the possibility and practicability of reforesting logger-off areas, therefore it is conceded that this is not a strange subject to members who are present at the Logging Congress. As others have written on the advisability of starting reforestation at an early date, that needs no further comment here. Now that the problem of "growing trees for growing children" confronts everyone in the logging and lumbering business, it might be well to outline the work accomplished along those lines in the redwood region of Northern California.

The Union Lumber Co., of Fort Bragg, was the first to adopt the policy of reforesting logged-off lands and soon proceeded to take the necessary steps to make the policy a reality. During the past year other companies have adopted the same policy and in Humboldt County they have united to form the Humboldt Redwood Reforestation Association. The membership in this association includes not only the operating but also the non-operating companies, with a total acreage amounting to nearly 357,000 acres of land best suited for growing forest trees.

With some forest management and reforestation has progressed only to the stage of protecting the present timber and reproduction from destruction by fire. Since this is one of the most essential features of the entire program, it is considered that progress has been made in the right direction for future development. To finance the activities of the Redwood Reforestation Association the members are taxed 2 cents per acre on timbered lands and areas intended for reforestation. The association has functioned in spreading the doctrine of fire protection throughout the county and every tourist who traveled over the famous Redwood Highway could not help but read the fire warning signs that requested assistance in saving the redwoods from destruction by fire.

## Facts Placed Before Senate Committee

**T**HE association has also been instrumental in placing before the Senate investigating committee essential facts about the lumber business in the redwood region. Favorable legislation for fire protection and reforestation is expected to be accomplished through this organization.

As to the actual growing of redwood trees from seed and planting these trees in the logged-off land, there is more to be done than said at the present time. The Union Lumber Co. has operated a forest nursery for several years and has some of the stock planted in the field and well on its way towards making sawlogs for the future generations.

In Humboldt County The Pacific Lumber Co., of Scotia, started a reforestation nursery during the latter part of the year 1922. The first redwood seeds were sown January 6, 1923, and that date may be considered as the beginning of the crop of hand-raised redwoods for this company. With seed secured from the Union Lumber Co., experimental planting was done throughout February, March and April in 1923. The object of variation in time of sowing was to determine if possible the period best suited for planting the seeds.

In all, there were 66 standard 4x12-foot seedbeds sown to redwood, and a very complete record kept of the seed used and the results obtained. To date the results would indicate that seed sown about the first of March makes the best growth. However, as no fall planting was done at Scotia, final conclusions cannot be made now. Since natural seeding occurs in the fall, one would expect better results from seeds planted in the nursery the same time. Further experiments along this line will be conducted in the future.

What early January seeding was done in the nursery proved very unsatisfactory. Whether the failure of the seed to germinate was due to climatic conditions or to the manner in which the seedbeds were prepared is not known definitely, but it is thought the latter was the most influential. Upon the failure of the first sowing to produce results, some of the seedbeds were dug up and another sowing made on February 23, 1923. Some of the trees from this sowing were, on September 28, fully 18 inches tall. In fact, all of them appeared to make a much quicker growth than those started in January. Although such an annual height growth is to be desired after the trees have been planted in the field, it is really to a disadvantage the first year, because they will be too large to field plant economically. Such growth can be retarded somewhat by practicing root pruning, decreasing the amount of watering done and removing the shades from the seedbeds earlier in the season.

With Mendocino County seed sown in February and March, a stand of 90 trees per square foot was secured. During the early season, when

the trees were but an inch or two tall, the stand appeared to be too thin. With age, the lateral branches filled the vacant spaces and by the middle of August the trees showed the effect of being too close together by the development of the fungus *Botrytis*, which causes the disease commonly referred to as "damping off."

To prevent this disease from killing the young trees shortly after germination, the ground is treated with from six to eight ounces of commercial sulphuric acid per 48 square feet previous to sowing. If it occurs after germination, then dry sand is sprinkled over the seedbeds. When it appears late in the growing season, little can be done except to open up the dense stands and decrease the amount of moisture around the lower branches where it appears to start.

Seeds secured from Santa Cruz County averaged 102,000 to the pound and showed 20 per cent viability by the cutting test. Eight ounces of seed were sown to a seedbed during the last week in April. Most of the seeds had germinated within 15 days and a tree count made a month later showed the average stand to contain 41 trees per square foot. Where the trees were of that density or less damping-off did not occur, but in clumps where there were 90 to 140 trees per square foot this disease proved quite destructive. The damage done appeared to be in direct ratio to the density of the stand.

From these experiments it is concluded that where redwood trees are to be raised from seed to field planting in one season it is necessary to sow with the intention of securing from 90 to 120 trees per square foot, then thinning to 75 or 85 per square foot, depending upon the rapidity of growth which the trees made in one season.

## Seedlings Soon Ready for Field Planting

**A**T first it was thought that only a small percentage of the seedlings would be large enough for field planting at the end of the first season, but present indications are that at least 30 per cent of the stock will be of sufficient size for that purpose. It may prove more economical to discard the other 20 per cent rather than spend time and money in raising them as transplants when more 1-0 stock can be produced the following year for field planting.

This experimental work must be carried on for several years before any set rules can be adopted for the nursery work. The results obtained this year differ so much from those previously secured at forest schools and elsewhere outside of the redwood region that they must be modified to conform to local conditions.

Although all facts have not been obtained as to the reproduction of redwood for reforestation purposes, sufficient have been secured to convince the owners of redwood timber that such steps are necessary to insure the continuous operation of their present mills and factories. The time may come when each large operator will maintain a reforestation nursery to supply the seedlings necessary to restock the cut-over lands, but for the present those desiring trees have arranged to secure them from the nurseries at Fort Bragg, in Mendocino County, and Scotia, in Humboldt County.

The reforestation nursery at Scotia contains approximately 610 square feet under cultivation this year. Next year there will be more than seven times as much in order to take care of the million and a half trees needed by The Pacific Lumber Co. and other large operators in this region. With that number of trees 3000 acres can be planted in 1924-25. To prepare for future development in the nursery, two more acres of land along the Redwood Highway will be cleared of stumps next year. This in itself is an expensive proposition, for the original tree grew large and close together on the flat along the Eel River.

Although redwood is the chief species to be raised, it is the intention of the lumber companies to plant some Douglas fir, Sitka spruce and Port Orford cedar, as these species are found scattered throughout the virgin stand of redwood to greater or less extent. Generally these trees make the best height growth during the first 20 or 30 years, and for that reason will afford protection from wind for the redwood trees. Later the dominate trees can be removed in the thinning operations and the redwood trees will then increase their annual growth as has been noted by observations made in conjunction with other experimental cuttings.

## Sprout Reproduction

**T**HE production of redwood by sprouts is a great asset to the work of reforestation, for it is estimated that at least 25 per cent of the logged-off area will have reproduction started by the end of the first year after the logs are removed. As a matter of fact, the sprouts start

growing shortly after the tree is cut, but in the process of logging many of these are destroyed by fire or torn from the stumps by the moving logs. Consequently this form of reproduction is delayed from one to two years, depending on the amount of timber felled previous to yarding.

When allowed to grow, hundreds of sprouts will come out around a single stump and reach a height of from two to five feet the first year. This growth, which is greater than that of a seedling of the same age, is due chiefly to the fact that the root system of the old tree can supply a greater amount of moisture to the sprouts than a seedling can obtain through its own newly developed system. After a number of growing seasons, there appears to be little difference in the trees that grow from seeds and those that develop from sprouts. The structure of the wood and the durability is considered equal, and it seems logical that it should be, for even in the so-called virgin stands of redwood one can find trees from four to five feet in diameter that unmistakably have started their growth as sprouts several hundred years ago. It is due to sprout growth that "redwood circles" are formed. This odd arrangement of the trees may be observed in any old stand of redwood. Still there are some people who say sprouts will never develop into a tree of commercial value or size. It is thought that such statements are made due to the lack of accurate information.

## Prevent Occurrence of Fires

**A**S the success of reforestation is dependent to a great extent upon fire prevention, that subject should be given considerable thought by those intending to practice forest management. For some reason unbeknown to the younger generation, there has prevailed in the redwood region the erroneous belief that fire in the forests will do no damage. To anyone who has made a study of the conditions there, it is quite evident that each succeeding fire running through the timber will take its toll of valuable lumber and add to the possibilities of greater loss when the next fire comes. It is true that the losses are not as great as in the pine and Douglas fir regions, due to the absence of resinous trees in great abundance. The presence of such evergreen trees as tan bark oak and Madrona and the evergreen huckleberry brush helps to check the lightest fires. Nevertheless, when a fire runs through the green timber on a hot summer day, when the relative humidity is down to 48 and a stiff wind is blowing, there is going to be something burn. When the old trees are sound at the base and protected with a thick layer of bark, they may escape with slight injuries, even though the flames may run from the base to the top 300 feet above the ground. However, certain areas have been observed where the fire has been great enough to kill all the leaves on even the tallest trees. These trees may sprout at the base, but the trunk will be dead and remain as fuel for the following fires.

Where there is the least opening in the base of the tree, fire will enter there and continue to burn away all dry wood. The heat formed in such a cavity tends to dry out the layers of moist wood and soon they will be burning also. Some people say that redwood does not burn, but it has been observed that certain trees that caught fire in May were still burning in August. In other instances intense fires have not more than scorched the timber. The variation appears to be in the amount of moisture present and the exposure of the surface to the air.

## Few Areas Free From Fire

**I**T is stated by experienced woodsmen that there are no extensive areas of virgin redwood timber that has not at some time been reforested by fire. By inspection of the stumps after the fallers cut the trees down, one can often trace the fire history of a locality. In one instance the writer was able to identify fire scars made 150 and 300 years ago in a tree that was approximately 800 years old.

Because stands of old timber have not been wiped out entirely during a burn, when no efforts were made to check the fire, the majority of people have come to look upon forest fires as things to be accepted rather than avoided. Therefore, in adopting a policy of forest management and reforestation, fire prevention becomes a big factor, for it is a sudden and complete change from an old to a new policy. This change must not only be made within the company's organization, but the public and all those apt to cause fires or render assistance in suppressing them must be educated to the policy of fire prevention.

To accomplish the desired results, associations composed of timber owners and lumbermen have been formed. The Redwood Fire and Protective Association has been in operation for a number of years in Mendocino County and has achieved



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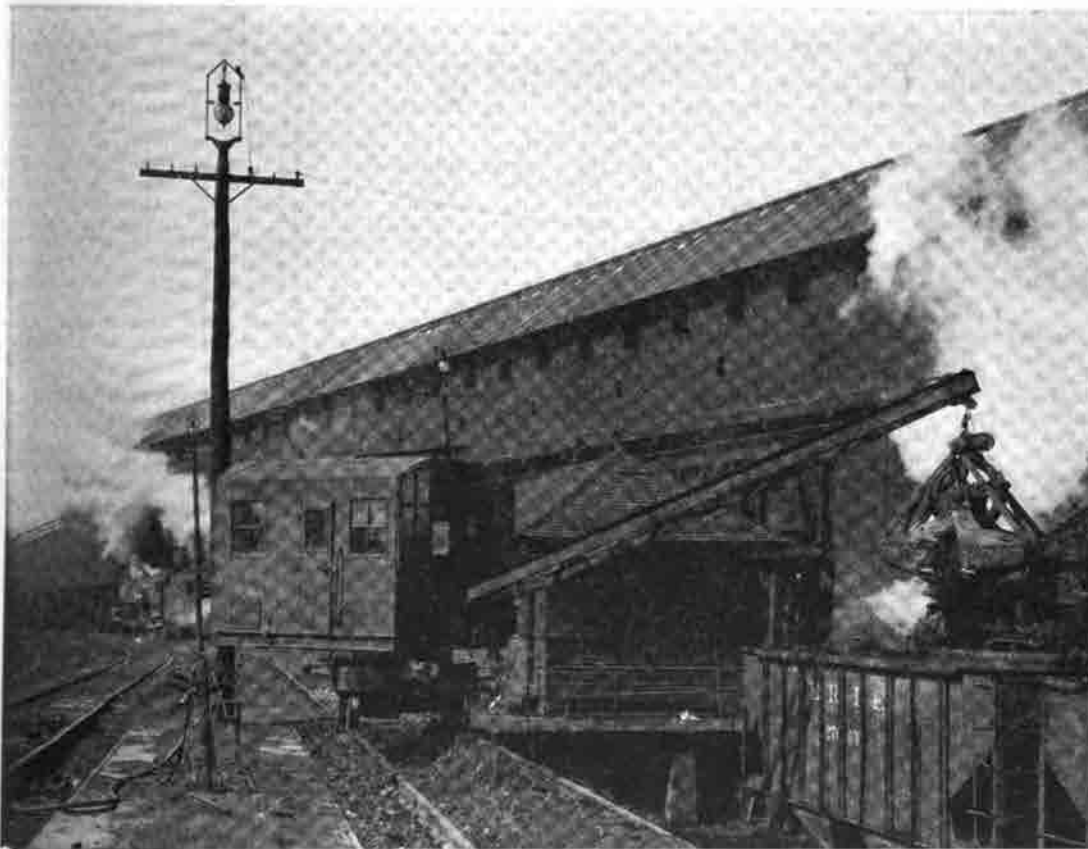
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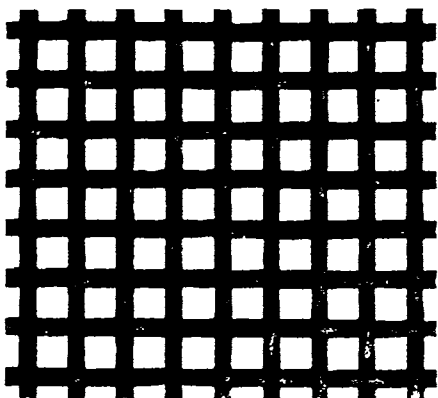
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marked success in the way of preserving the timber from destruction by fire. In 1923 the Humboldt Redwood Reforestation Association was organized and began its campaign of fire protection by posting fire warning signs in conspicuous places throughout the county. Individual companies have employed various means of protecting old and second-growth timber. As the detailed plans of such work should be discussed under the subject of fire prevention, it will not be dwelt upon in this paper. Suffice to say that the young sprouts and seedlings suffer more from fire than do trees that have reached the age of 30 years. Although the fire may only burn the leaves from the branches and leave the trunk unharmed, it will at least retard the growth because new sprouts must come from either the dormant buds in the tree trunk or else around the ground line on the stump. It has been observed that even one-year-old seedlings have a burl formation on the stem just below the ground line. If the young tree is injured sprouts will start from this burl. With such preparation for reproduction in young trees, a young plantation might be burned over and still reproduce enough sprouts the following year to restock the devastated area. Should repeated burns occur, as is often the case, the sprouts will be killed eventually.

### New Growth Is Marked

MUCH of the area logged off years ago now bears a fair stand of reproduction, partially due to sprouts and part to seeding in from adjacent old stands and scattered seed trees left when ground yarding was the only method used in logging. With high lead yarding practically all trees left after felling has been completed are knocked down by yarding lines or traveling logs.

The time may come when it will be justifiable to revert to ground yarding in order to leave unharmed trees in the present stand that are less than 12 to 14 inches in diameter. These trees will not only function as seed trees to restock the area but the rate of volume growth will become greater. If the tree trunk is cleared of its lower branches in the process of felling adjacent trees, then the new growth will be producing clear lumber. As practically all the clear lumber of the future must come from such trees, they will be the cream of the forest when the time comes for the transposition in the lumber market from old-growth clear to second-growth merchantable. For this reason it is advocated that even under the present system of yarding these smaller trees should be saved when it is possible to do so without materially retarding the work or increasing the cost of logging.

Under the present system of using the smaller trees in making a layout for the larger ones there are relatively few trees left standing after the fallers have worked over the ground. For that reason it has been suggested that if a practical method of lowering the trees could be devised, not only a great amount of valuable timber would be saved from breakage, but there would still remain a stand of timber on the ground to assist in natural reforestation. By conserving the present stand of old-growth timber through closer utilization the supply will last longer and the trees planted now will have that much longer to grow before they must be cut to supply the demand.

### Field Planting Is Limited

TO date there has been some field planting done in both Mendocino and Humboldt counties. Because of the limited stock available last year, no extensive areas have been reforested in this manner. This year there will be more than 500,000 trees available for planting over an area containing approximately 1000 acres. It is anticipated that considerable experimental planting will be done in order to determine the best time in which to put the seedlings in the plantations. It is also desired to observe the effect that different soils, sites, slopes and aspects have on the rate of growth.

From some planting done near Scotia in 1922, it has been found that it is not advantageous to plant where grazing is intensive. Although cattle will not browse on redwood, they do considerable damage by trampling and nipping off the ends of the young shoots that are intertwined with edible grasses. An inspection in August showed that 50 per cent of the trees planted in November, 1922, were alive and growing. As cattle had grazed over the plantation continuously since the trees were set out, this is considered a fair per cent of survival. Under more favorable conditions better results should be expected. It is thought that cattle can be grazed on redwood plantations without harm after the trees have been planted four or five years. It is true that during that period the rank growth of grass and weeds will add materially to the fire risk, but that must be taken care of by intensive protection.

When the trees have become eight or ten years old and tall enough to have their crowns out of reach of sheep, then these animals may be pastured in the plantation also. When other vegetation becomes scarce, sheep will eat the redwood cut-over lands intended for reforestation until leaves and for that reason must be kept out of

the sprouts and seedlings are old enough to be safe from harm.

When the trees are planted about eight feet apart their branches will intermingle when they are 15 to 20 years old. When complete shade is formed over the ground the grass and weeds will die out.

### Thinning Proves Beneficial

FROM experiments carried on by The Pacific Lumber Co. in stands of second-growth timber it has been found that thinnings can be made for either cordwood or the betterment of the stand. As the cost of producing cordwood is greater by selective than clear cutting, the product cannot be disposed of as cheaply as that offered for sale by adjacent ranchers who figure on clearing their land for agricultural purposes and not making cordwood production a paying business.

Woodcutters estimate that it costs \$2 to make a cord of wood under the clear cutting system. Whereas experiments conducted in selective thinnings show the cost to be approximately \$3.75 per cord. To this must be added the cost of transportation from woods to highway or railroad and then to the market in the city. If the wood is to be sold in short lengths, then an additional charge for sawing must be added in order to fix a sale price. A stumpage price should also be included in order to get returns on the investments made for fire protection, taxes and other costs.

For a company to hire all the work done by day labor makes the unit cost around \$9.50 per cord, which is so close to the selling price obtainable there is no profit in the operation. A contractor who would do part, if not all, of the work himself, could make a profit on the operation, because he would be making better than wages and the overhead charges would be very small.

When the market price becomes greater, due to the scarcity of wood, then it will pay to thin for cordwood the same as is being done in the second-growth forests of the New England states. However, as long as the waste left in logging the virgin stand of timber exceeds that obtainable in thinning second-growth forests, it is false economy to remove trees that are growing and adding to the value of the property, when refuse may be used instead.

It is true that to remove certain trees from the stand will add to the volume and value of the lumber produced by the remaining trees. However, the cost of such work must be kept in mind, and for the present it is considered inadvisable to carry on extensive thinnings, even though there are several thousand of acres where such work might be done.

On a small tract containing 3.5 acres, where there was a mixed stand of redwood, fir and alder, the fir and alder were removed as thinnings, together with some old-growth redwood refuse left after tiemakers had finished working there. The yield per acre amounted to 42.6 cords, represented by the three species as follows: Douglas fir, 18.6 cords; alder, 8.7 cords, and redwood, 15.3 cords. The thinning there was made with the idea of removing the dominant trees that were retarding the growth of the suppressed and co-dominant redwoods. Inferior trees that were not interfering with the development of the stand were left to afford shade that would keep the forest dark and moist, thus retarding the growth of underbrush and adding to the safety from fire.

### Determine Quality of Experiments

IN conjunction with the division of forestry at the University of California, the Union Lumber Co., of Fort Bragg, and The Pacific Lumber Co., of Scotia, carried on some cutting experiments to determine the quantity, quality and general appearance of lumber cut from second-growth trees of this region. The results obtained have been assembled by Professor Emanuel Fritz, who represented the university in this work. No doubt they will appear in the near future as a bulletin from the University of California.

A study of the results will prove enlightening to those interested in reforestation, for the figures show what can be expected from trees that are 50 years and older. The redwood trees of that age averaged better than 500 board feet per tree, mill tally. The mill tally gave 21.7 per cent higher results than the Spaulding scale and 5.6 per cent lower than the International rule. The average annual growth amounted to 9.6 board feet per tree. Other species cut from the same forest show the annual growth to be as follows: Sitka spruce, 26.0 feet board measure; Douglas fir, 15.4 feet board measure; white fir, 18.3 feet board measure. The redwood showed 11.6 per cent clear lumber, whereas the other species did not make 2 per cent. The bulk of the redwood graded as construction, while in the other species the greatest portion was represented in the extra merchantable grade.

There is no intention of cutting this kind of lumber for the market at the present time. As a result of sawing out 11,436 board feet from 70 logs, representing four species of common forest trees, it was possible to learn what the future



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PORTLAND, OREGON, U.S.A.

holds in store for the company that starts reforestation now. To secure this information is like reading the pages of history before they are written, for now it is a known fact that commercial lumber can be produced in this region within 50 years from second-growth trees, and the present stand of reproduction has a value that is increasing in price, quality and volume.

The value of second-growth stumpage today is small and varying, depending on whether the owner considers it a nuisance or an asset. In one instance it is known where land covered with second-growth timber about 55 years old was purchased at a price per acre which would make the stumpage price near \$1 per thousand board feet. It is thought that the owner considered the land of more value than the timber, for the purchaser intended clearing the land and using it for agricultural purposes. In other instances stumpage prices for cordwood operations were about 25 cents per thousand feet board measure. This is the same price that was paid for old-growth stumpage along the Eel River near Scotia in 1886. If that timber was standing today it would sell for at least \$7 per thousand feet board measure. The stumpage price for second-growth timber may not increase at such a rapid rate, but it is a certainty that as an investment it will bring returns in the future.

### *Increases Rapidly in Value*

AS the quality of lumber in young trees grows better with age, that is another important factor in determining the value of the stand and the time when it should be cut for sawlogs. A tree that contains but No. 2 grade of lumber at 40 years may, if allowed to grow 20 years longer, produce enough clear material to double the value of the tree.

In the University of California bulletin No. 361, Professor Donald Bruce shows in his "Preliminary Yield Tables for Second-Growth Redwood," that the greatest average annual growth occurs between the ages of 50 and 55 years on all sites. The annual growth during those years will run from 2335 board feet per acre on site No. 1 to 1560 board feet on site No. 3, there being from 347 to 384 trees per acre during that period. If stumpage prices remained at, say, 50 cents per thousand, which they will not do, the annual earnings per acre due to volume growth would be about 75 cents. By anticipating the rate of increase in stumpage prices and adding to that the increase in value due to quality and quantity, one can compare the earning powers of second-growth with old-growth timber which has very little increase in quality, only a small percent in quantity and practically the same in stumpage price.

A study of the possibilities of reforestation and management has been made in this region and the prospects are so favorable that many lumber companies have adopted the policy, even though the tax question has not been settled as yet. They realize that by starting now the new crop of timber will continue to grow while mooted questions are being discussed by legislative bodies, and other lumbermen wait to see what will happen.

It is predicted that the lumbermen who expect to stay in the business without starting reforestation soon, will be like the "man without a country," of whom you no doubt have read in school days past. The schoolboy of tomorrow will have a new version that reads as follows:

Lives there a man with mind so dead,  
Who never to himself hath said,  
I'll raise young trees on logged-off lands?  
If such there be, go mark him well.  
In years to come no logs he'll sell,  
For business will have gone to—The Redwoods.

## Roller Bearings on Donkey Engine Friction Pins

By N. B. McCauley, Nimpkish Timber Co., Ltd.,  
Alert Bay, B. C.

FOR many years it has been a problem for the logger to overcome the disadvantage of having friction pins break or weld. I have handled almost all types of donkey engines and skidders and have found the problem of keeping the friction pins in good order, especially when yarding a long distance in heavy timber, has always been a difficult one. In 1922, in connection with Mr. Stafford, of Vancouver, B. C., I worked out a device—a friction pin roller bearing. This roller works between the friction screw and the friction pin, limiting all rotation on friction pins and friction screws.

I made a special test on a roller bearing, employing ordinary soft steel for friction pin, made in one piece instead of the ordinary three pieces. This friction pin was used for eight months on a high lead donkey engine and when taken out at the end of that time showed no signs of wear. Prior to using the roller bearing we were compelled sometimes to shoot broken and welded pins out of the shafts, but since using roller bearings we have not the pleasure of shooting broken pins nor have we had any delays with our frictions.